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EBASCO

REM III PROGRAM

REMEDIAL PLANNING ACTIVITIES AT SELECTED UNCONTROLLED HAZARDOUS SUBSTANCE DISPOSAL SITES WITHIN EPA REGIONS I-IV

FINAL

BASIS OF DESIGN REPORT
FOR SITE WORK
REMEDIAL DESIGN
WIDE BEACH SITE
WIDE BEACH, NEW YORK
TOWN OF BRANT
ERIE COUNTY, NEW YORK

EPA CONTRACT 68-01-7250

EBASCO SERVICES INCORPORATED

EBASCO SERVICES INCORPORATED EBASCO

160 Chubb Avenue, Lyndhurst, NJ 07071-3586, (201) 460-1900

September 23, 1988
RMOII -88-313

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SUBJECT: FINAL BASIS OF DESIGN REPORT FOR SITE WORK
REMEDIAL DESIGN
WIDE BEACH DEVELOPMENT SITE
WIDE BEACH, NEW YORK
WORK ASSIGNMENT NO: 86-2L46
EPA CONTRACT NO: 68-01-7250

Gentlemen:

Ebasco Services Incorporated (Ebasco) is please to submit four (4) copies of the Final Basis of Design Report for Site Work. This report has been prepared under Subtask 7.1 of the Final Work Plan for Remedial Design submitted to EPA in April 1988.

This Final Basis of Design Report incorporates your comments transmitted to us with your letters of June 1, 1988 and June 6, 1988.

If you have any questions regarding this report, please do not hesitate to call Joe Cleary at (201) 460-6578.

Very truly yours,

Dev R. Sachdev

Dev R. Sachdev, Ph.D., P.E.
Regional Manager - Region II

cc: D Sarno (EPA)
M K Yates (ZPMO)
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S Scharf (NYSDEC)
J Feron (NYSDEC)

September 23, 1988

Mr M Shaheer Alvi, P E
Mr Herbert King

SUBJECT: FINAL BASIS OF DESIGN REPORT FOR SITE WORK
REMEDIAL DESIGN
WIDE BEACH DEVELOPMENT SITE
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ACKNOWLEDGEMENT OF RECEIPT

Please acknowledge receipt of the enclosure on the duplicate copy of this letter and return it to the sender at the above address.

M Shaheer Alvi, P E

Date

EPA WORK ASSIGNMENT NUMBER: 86-2L46
EPA CONTRACT NUMBER: 68-01-7250
EBASCO SERVICES INCORPORATED

FINAL

BASIS OF DESIGN REPORT FOR SITE WORK REMEDIAL DESIGN WIDE BEACH SITE WIDE BEACH, NEW YORK TOWN OF BRANT ERIE COUNTY, NEW YORK

SEPTEMBER 1988

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1.0 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Ebasco Services Incorporated (Ebasco) is submitting this Basis of Design Report on the Wide Beach Site remedial design to the U.S. Environmental Protection Agency (EPA) in response to Work Assignment Number 86-2L46 under Contract Number 68-01-7250.

This Basis of Design Report contains a summary of the site history, site features, extent of the site PCB contamination, regulatory requirements including the Record of Decision (ROD) (Reference 1); and a discussion of the general sequence of remediation activities, associated design criteria, and the technical bid package preparation.

Discussions of the basis of design for the chemical treatment of the PCB-contaminated soils will be provided in a separate report after completion of the pilot plant studies.

The site features discussed are those considered pertinent to the basis of design and are extracted from the Remedial Investigation (RI) Report (Reference 2).

To provide an overview of the extent of the site PCB contamination, data collected prior to the ROD are summarized and additional data collected by Ebasco are presented.

The regulatory requirements section presents a discussion of selected remedies of the ROD which defines the scope of the work, and provides a listing of applicable or relevant and appropriate federal and local regulations.

Design criteria are presented for each of the remediation activities to define a basic framework from which the remedial design drawings and specifications will be developed. Cross references are provided in the design criteria to the federal and New York State regulations which are expected to affect the activities.

1.2 SITE LOCATION

The Wide Beach Development site, incorporated in 1920, is a small lakeside community located in the Town of Brant, in southern Erie County, New York, approximately 30 miles south of Buffalo. The site location is shown on Figure 1-1. Wide Beach encompasses approximately 55 acres, of which 40 acres were developed for residential use. The undeveloped land at the site is largely forested. The site is bounded on the south by wetlands and the Cattaraugus Indian Reservation, on the west by Lake Erie, and on the east and north by residential and agricultural property. An area called "The Grove", located northeast of the "The Oval", is community-owned property used for recreation. A site plan is presented on Figure 1-2.

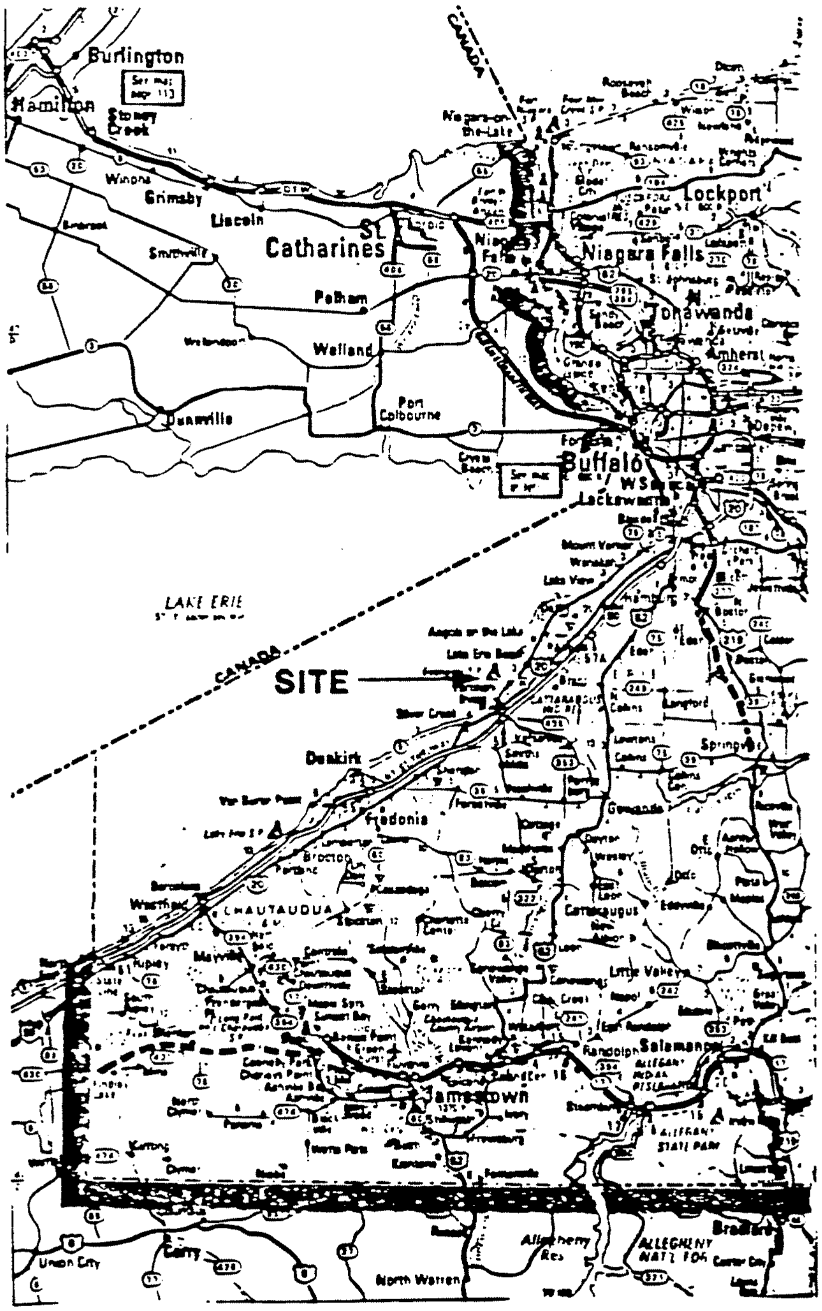


FIGURE 1-1

WIDE BEACH DEVELOPMENT SITE LOCATION MAP

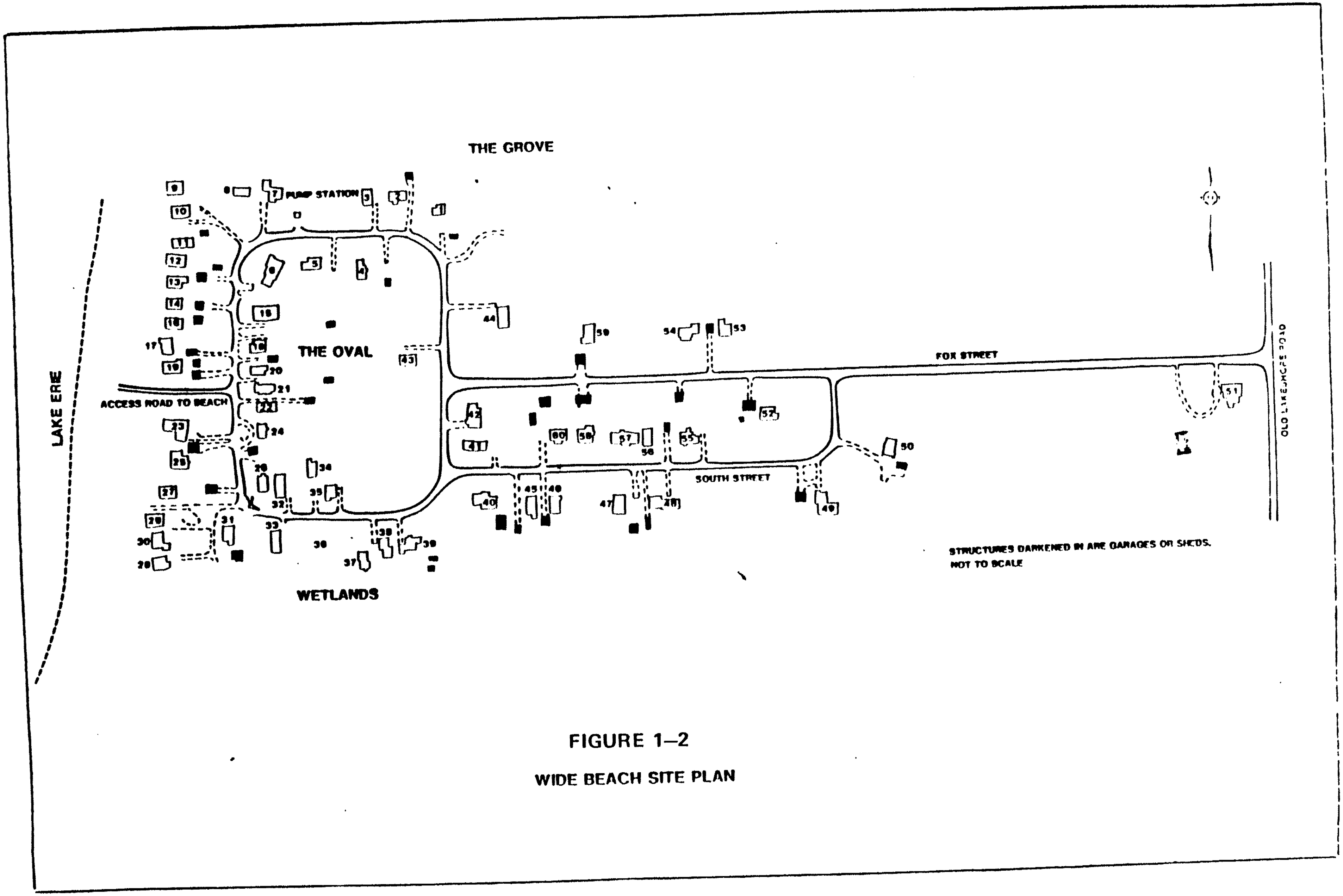


FIGURE 1–2

WIDE BEACH SITE PLAN

1.3 SITE HISTORY

Until June-July 1985 when EPA performed a drainage ditch/road paving operation as an immediate removal action, the Wide Beach Development's 1 mile roadway consisted of gravel and local soils. Grass-lined drainage ditches and a series of catch-basins, culverts, and unnamed watercourses collected and conveyed stormwater to the wetlands south of the site, draining to Lake Erie.

Between 1968 and 1978, up to 41,000 gallons of waste oil, some of which was contaminated with polychlorinated biphenyls (PCBs), was applied by a mechanized oil spreader to the local roadways by the Wide Beach Homeowners Association for dust control.

In 1980, the installation of a sanitary sewer line in the community resulted in the excavation of highly contaminated soils from the roadways and their vicinity. Because it was not known at that time that a PCB problem existed, surplus excavated soil was used as fill in several yards and in the Grove.

An Erie County Department of Environment and Planning (ECDEP) investigation of an odor complaint in 1981 located 19 drums in the nearby woods, two of which contained PCB-contaminated waste oil. Subsequent sampling indicated the presence of PCBs in air, roadway dust, soil, vacuum cleaner dust, and water samples from private wells. Based on these data, ECDEP recommended closing one well, and advised against planting root crops for human consumption.

Sampling by the EPA Region II's Field Investigation Team (FIT) in April 1983 confirmed the presence of PCBs in both the groundwater and soils. Testing for dioxin at that time indicated that it was not present. The FIT returned to Wide Beach in mid-November 1983 to sample all of the residential wells, detecting only trace levels of PCBs in several of the wells. The PCB concentrations were not deemed an imminent health hazard to the community.

In February 1984, EPA and the State of New York signed a Cooperative Agreement to undertake a Remedial Investigation (RI) and Feasibility Study (FS) at the Wide Beach Development site. In April 1985, EA Engineering, Science and Technology, the State's contractor, completed the RI report (Reference 2). The FS report (Reference 3) was completed in August 1985.

In June-July 1985, in response to the levels of PCB contamination found in the homes during the RI, EPA performed an immediate removal action to protect the public until long-term remedial measures could be implemented. This action included: (1) paving of the roadways, drainage ditches, and driveways to prevent further exposure of the public via the dust and runoff pathways; (2) decontamination of the homes by rug shampooing, vacuuming, and replacement of air conditioner and furnace filters; and (3) protection of the individual private wells from sporadic incidents of PCB contamination by the installation of particulate filters.

A ROD was signed in September 1985. The ROD (Reference 1) recommended excavation and chemical treatment of the contaminated soil from the roadways, drainage ditches, driveways, yards, and wetlands as the long term remedial measure for this site. In addition, it recommended that PCB contaminated perched water in the sewer trench be extracted and treated.

Ebasco prepared the Draft Work Plan for remedial design for the Wide Beach Development in September 1986 for performing additional field investigations and treatability studies, and for developing a technical bid package for the required remedial activities. The Final Work Plan was submitted to the EPA in April 1988 (Reference 4).

1.4 REQUIREMENTS OF THE ROD

The selected remedies summarized in the ROD consist of the following items:

1) Excavation of the PCB-contaminated soils with PCB concentrations greater than 10 mg/kg in the roadways, drainage ditches, driveways, yards and wetlands.

2) Disposal of the contaminated asphaltic material, retaining uncontaminated asphaltic material for reuse in repaving.

3) Chemical treatment of the PCB-contaminated soils.

4) Use of the treated soils as fill in the excavated areas.

5) Repavement of the roadways and driveways.

6) Treatment of the perched water in the sewer trench.

7) Construction of a hydraulic barrier at the end of the sanitary sewer trench.

8) Pilot plant treatability study to determine an effective treatment scheme for chemically neutralizing the PCB-contaminated soils.

9) Sampling for PCBs in soils from the back yards, sewage from the lift station, and sediments in the disconnected septic systems to better define the extent of the contamination.

As a result of the supplemental investigations conducted by Ebasco as discussed in Section 2.2.3, additional information developed has necessitated the following modifications to the selected remedies in the ROD:

1) Asphaltic material is not contaminated with PCBs and disposal of this material will not be required.

2) Draining and treatment of the perched water in the sanitary sewer trench is not required.

3) Construction of a hydraulic barrier at the end of the sanitary sewer trench is not required.

Sampling for PCBs in soils as required in Item 9 of the selected remedies has been completed by Ebasco as part of supplemental investigations discussed in Section 2.2.3.

Discussions pertaining to chemical treatment of the PCB contaminated soils (Item 3) and pilot plant treatability study (Item 8) will be provided in a separate report.

2.0 SUMMARY OF EXISTING DATA

2.1 SITE FEATURES

2.1.1 Population and Land Use

As stated in the ROD (Reference 1), there are 60 residences in the Wide Beach community which accommodate approximately 120 people in the summer months. Approximately 45 people reside at Wide Beach year-round. Along the Lake Erie shoreline, west of Lakeshore Road in the site vicinity, the population is largely seasonal. North of the site, from Lotus Bay to Evangola State Park, there are approximately 60 private housing units. The Synder Beach Community, at the southern border of Wide Beach, includes approximately 150 housing units. An Indian reservation community at the mouth of Cattaraugus Creek has 50-60 housing units. In addition, there are approximately 14 housing units on both sides of Lake Shore Road, just east and south of the Wide Beach Development.

Land use in Wide Beach is residential. Regional land use is primarily agricultural and rural residential. Undeveloped acreage is largely forest and may be utilized for hunting. The nearest year-round population center with respect to Wide Beach is the Village of Farnham which is located 1.25 miles east of the site and has a population of 404.

2.1.2 Topography

Wide Beach lies within the Erie-Niagara Basin in the Central Lowlands Physiographic Province, characterized by flat terrain of low relief. The topography of the Wide Beach site is flat with surface elevations on the order of 587 ft above mean sea level (MSL) along Fox Street and at the Oval. The land slopes gently southward to the wetland bordering the site at about 579 ft MSL. Along the lake shore, relief is on the order of 11 ft where the site drops sharply to the beach.

2.1.3 Hydrogeology

Based on boring data obtained during the RI (Reference 2), the overburden at the site, averaging 11 ft. in thickness, is predominantly till and glacial lake deposits. The till is composed of dark gray and brown silty clay with some rounded rock fragments.

The surficial soil near the lake edge and immediately next to the wetland area is a silty sand with a thickness of 2-4 ft. This soil horizon was not found elsewhere on-site. In the remaining areas of the development, the surficial 0.0-6.0 ft of soil is composed of dark brown silty clay, with large amounts of varying grain sizes of sand and some gravel.

The surficial soils are underlain by a brown, clayey, fine-grained sand. This sand layer is found throughout the site except for the boring locations near the wetlands. The thickness of this layer varies up to 3 ft. In some locations, thin lenses of this soil alternate with layers of a brown silty clay. This brown silty clay (classified as till) is the next significant soil horizon. It contains some small rounded rock fragments, and its consistency is from stiff to very stiff.

The weathered bedrock consists of a decomposing shale and angular shale fragments. This layer is generally only a few inches in thickness on the site, but locally it is as much as 3 ft thick. These thicker zones of weathered bedrock are found in the eastern portion of the site.

A water table was seldom encountered during the RI (Reference 2).

The aquifer of concern at the site is the shallow bedrock aquifer confined by the overlying till and includes mainly the weathered bedrock and zones of shallow tension cracks, open joints, and fractures. Recharge to the on-site wells occurs predominantly through these aquifers.

Figure 3-3 of the RI report (Reference 2) illustrates the potentiometric surface of the shallow bedrock aquifer in December 1984 when water levels were highest during the RI. Figure 6-1 of the RI report shows the hydraulic profile of the perched water in the sanitary sewer trench. The perched water condition is caused by a section of sanitary sewer trench, located to the west of the Oval, that cuts into the bedrock aquifer and induces an artesian upflow of confined groundwater. The perched water level in the sewer trench observed during the RI ranged from the lowest elevation of approximately 581 ft MSL near the southwest section of the Oval to the highest elevation of approximately 585 ft MSL along Fox Street.

The wetlands at the south of the site appear to constitute a groundwater discharge divide between the site and the land to the south of the wetlands. Based on the December 1983 contours, roughly 80 percent of the site's groundwater discharge is via the stream and wetlands with the remaining 20 percent discharging directly to Lake Erie.

2.1.4 Precipitation

The average annual snowfall depth in the Erie-Niagara Basin ranges from 70 in. in the north to 150 in. in the south. Most of the snowpack accumulation (70 percent) occurs from December through February. Annual precipitation is 44 in. in the south of the basin, which is the general area in which the Wide Beach site is located.

Rainfall intensity/duration-frequency curves for Buffalo obtained from the RI report (Figure 3-6, Reference 2) are provided in Figure 2-1.

2.1.5 Drainage and Runoff

As stated in the RI report (Reference 2), Wide Beach falls within Hydrologic Unit 04120103 which is part of what is commonly referred to as "the Erie-Niagara Basin". Stream discharge from the Erie-Niagara Basin is approximately one-half of the precipitation input with streamflow averaging 18 in./year. Precipitation averages 38 in./year and therefore 20 in./year is discharged almost entirely by evapotranspiration (USGS 1968). There is apparently a "negligible" amount of subsurface discharge to Lake Erie and the Niagara River due to the low permeability of rocks on the area (USGS 1968).

The flat topography of the Wide Beach site makes it difficult to define drainage patterns and divide the site into subbasins. Nevertheless, the topographic surveys and knowledge of existing drainage ditch patterns were used in the RI to delineate one subbasin which contributes drainage to Lake Erie, nine which drain to the wetlands area at the south of Wide Beach Development and one which appears to drain to the north. These subbasins, which include 55 acres are shown in Figure 3-7 of the RI Report (Reference 2).

2.1.6 Water Supply and Sewerage System

Residences in Wide Beach are served by individual private wells.

A sanitary sewer system was installed in Wide Beach in 1980. The system is owned by the Town of Brant's Lotus Bay Sewer District. Wide Beach residences are required to hook up to the system. The sanitary sewer system consists of 8-in. diameter PVC collector pipes that are gravity fed to the Wide Beach pump station at the north end of Oval Road. Sewage is discharged from the pump station to a 4-in. diameter force main and ultimately to the Big Sister Sewage Treatment Plant at Angola, New York located approximately eight miles north of Wide Beach.

The location and details of the sanitary sewer are provided in the drawings prepared by Edwards & Moonreiff, P.C., Engineers and Surveyors Springville, New York, for Erie County Sewer District No. 2 Erie County, New York, Lotus Bay Sewer District of the Town of Brant (Reference 5). Sewer lines are laid on top of a 1-2 ft bed of pea gravel. Approximately 1-2 ft of additional pea gravel surrounds the sewer line. The total depth of pea gravel in the trench is never less than 3 ft. Excavation trench material is present above the pea gravel and varies in depth from approximately 3 to 11 ft. The total trench depth varies from 6 to 14 ft. Sewer lines located directly underneath roadways and driveways are encased in concrete.

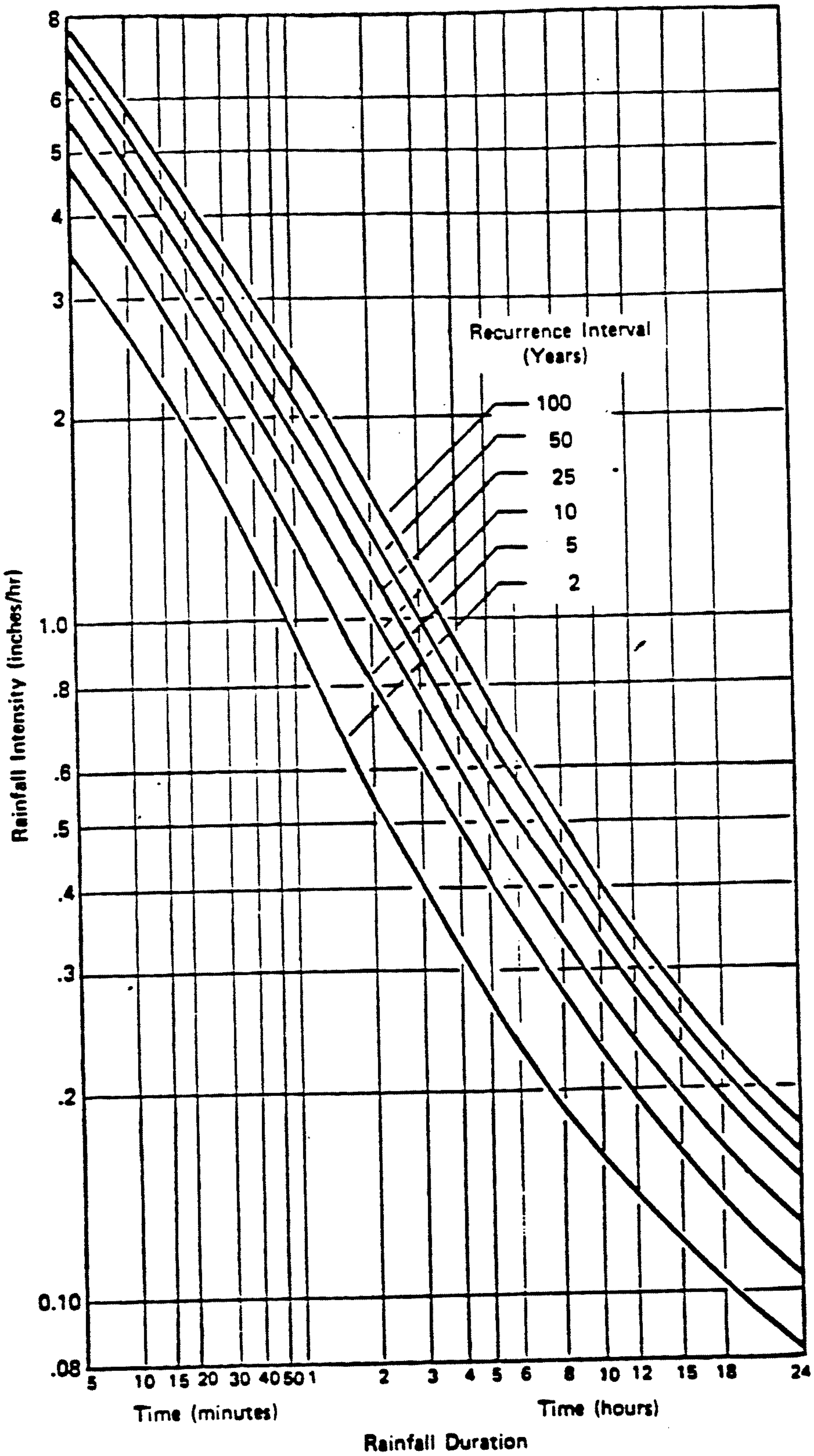


FIGURE 2–1

RAINFALL INTENSITY DURATION–FREGUENCY CURVES, (REFERENCE 2)

2.1.7 Ecological Setting

Natural forest, shrub, and wetland areas are predominant along the low lake plain where the site is situated. Portions of each habitat have been modified by the Wide Beach Development where natural vegetative communities have been cleared to make way for roads and house lots. In addition, there are now relatively open areas around buildings and along roads that are groomed seasonally to suit the tastes of property owners.

The roadside shrub community is composed mainly of dogwood, southern arrowwood and common elderberry. This growth is so dense that it is almost impenetrable, and there is no significant ground cover beneath the closed shrub canopy. The wetland area along the small stream to the south of the site features a dense ground cover of long-bristled smartweed. This species grows so thickly that few other species penetrate the wetland.

2.2 EXTENT OF CONTAMINATION

2.2.1 Overview of Existing Data Base

2.2.1.1 Remedial Investigations Prior to the ROD

Initial sampling was performed jointly by the Erie County Department of Environment and Planning (ECDEP) and Erie County Department of Health (ECDH) from August 1981 through October 1982. In April 1983, EPA Region II Field Investigation Team (FIT) personnel collected ground water and roadway surficial soils samples. From August through December 1984, the New York State Department of Environmental Conservation (NYSDEC) contractor, EA Engineering, Science and Technology (EA) performed RI sampling at the site including collection of: air; residential dust; drinking water, ground and surface waters; yard, driveway, open lot, catch basin, sewer trench and storm water outfall and wetlands soil/ sediments; well cores and soil borings; and biological specimens. Table 2-1 presents a summary of the PCB concentrations in various media at the site.

2.2.1.2 Supplemental Investigations by Ebasco

Ebasco performed supplemental investigations based on the following specific recommendations presented in the ROD.

- Sampling and analysis of residential back yards since only limited data were available for these areas.

TABLE 2-1

SUMMARY OF PCB CONCENTRATIONS
IN VARIOUS MEDIA AT WIDE BEACH SITE

	PCB CONCENTRATIONS
Driveways	0.18 - 390 mg/kg
Yards	0.05 - 600 mg/kg
Roadways	1.0 - 226 mg/kg
Drainage ditches	0.2 - 1026 mg/kg
Vacuum cleaner dust	0.25 - 770 mg/kg
Potable Wells	ND - 0.16 ug/l
Perched Water in Sewer Trench	1.4 - 5.7 ug/l
Surface Water in Marsh	0.2 - 2.9 ug/l
Surface Water Sediment	ND - 126 mg/kg
Stormwater Runoff	4.0 - 93 ug/l
Air Particulates	0.04 - 0.307 mg/m^3

ND - Not Detectable

Data from Reference 2

- o Two 24-hour composite samples were to be taken from the sewage lift station to determine whether laundry, bathing, and house cleaning, as well as infiltration, contaminated the sanitary sewer system.

- o The community was required to connect to a sanitary sewer system in 1980. Because the septic tanks may have received PCB-contamination prior to that from laundry, bathing, and house cleaning activities, any overflow or releases from the septic systems may pose a threat to the aquifer. Tank sediments from 20 of these septic tanks were to be sampled for PCBs.

The details of the sampling and analysis procedures are described in the Field Sampling and Analysis Plan (FSAP) which is contained in the Field Operations Plan (FOP) (Reference 6).

In order to develop a cost-effective removal strategy such that all and only contaminated material are removed, several additional site investigations were recommended by Ebasco at the initial kickoff meeting with the EPA and USACOE. As a result, the following additional investigations were performed:

- o Roadway and driveway asphalt sampling;

- o Sampling of front yards, wetlands, and open fields;

- o Sampling of sewer trench bedding and surrounding soil;

- o Characterization and bench-scale treatability tests of perched water in the sewer trench.

The locations of soil samples with PCB levels greater than 10 mg/kg are provided in Exhibit 1.

2.2.2 Remedial Investigations Prior to the ROD

2.2.2.1 Roadways, Ditches and Driveways

a) Roadways

Sampling of roadways was conducted by ECDEP in May 1982 and EPA Region II FIT in April 1983. Tables 4-20 and 4-21 of the RI report (Reference 2) summarize results of PCB determinations conducted on roadway soil samples collected in 1982 and 1983 respectively. Contamination was found to an approximate depth of 18 inches.

b) Ditches

Drainage ditches run parallel to the roadways on the sides of the roads. ECDEP conducted soil sampling of drainage ditches in 1981 and 1982. Table 4-19 of the RI report (Reference 2) provides a summary of results of PCB concentrations on surficial and deep soil samples. Contamination was found to an approximate depth of 36 inches.

c) Driveways

Sampling of driveways were performed to a depth of 4 in during the RI (Reference 2) in 53 residential driveways. Table 4-26 of the RI report summarizes results of PCB determinations. Contamination was found to an approximate depth of 12 inches.

2.2.2.2 Front Yards

PCB measurements from front yard samples collected by ECDEP in 1982 and EA in 1984 are presented in EA's August 1985 report (Reference 2, Tables 4-23 and 4-22, respectively). ECDEP collected one isolated grab sample of each yard from the surface soil at 0-6" depth. EA collected composite samples at 0-4" depth based on grabs taken 5', 15' and 25' from the roadway in the front yard. Neither sampling method was felt to be adequate to define the extent of contamination in the front yards.

2.2.2.3 Backyards, Open Fields, and Wetlands

PCB concentrations in soils were investigated in eight back yards, four of which have associated front yard samples. The results were as follows:

a) no back yard sample exceeds 10 mg/kg, and

b) front yards of the houses where backyards were sampled do not exhibit substantial PCB contamination (within the range of all front yards sampled) and only one associated front yard sample exceeds the 10 mg/kg criterion.

Data on back yards were extremely limited. No relationship or correlation was evident between front and back yard concentrations based on the available data. The information on variation in PCB contamination by depth was minimal.

2.2.3 <u>Supplemental Investigations by Ebasco</u>

2.2.3.1 Front Yards

Soil samples were collected to a depth of six (6) inches at five (5) to seven (7) locations from each front yard. Additional samples were taken at a depth of 6 to 12 inches at approximately 10% of the sampling locations.

The investigation determined that contamination does not extend over the entire front yard and is confined to a smaller area near the road (See Exhibit 1). Table 2-2 summarizes soil PCB concentrations from front yards. It should be noted that soil samples were also collected under four houses supported on cinder blocks (i.e. House 11,32,38 & 46). PCB concentration in the soil under the houses was less than 10 mg/kg except for House 32 which showed a PCB level of 14.8 mg/kg.

2.2.3.2 Backyards, Open Fields, Vacant Lots and Wetlands

a) Backyards

Soil samples were collected to a depth of six (6) inches typically at four (4) locations from each backyard. Additional samples were taken at a depth of 6 to 12 inches at approximately 10% of the sampling locations. Table 2-3 summarizes soil PCB concentrations from backyards.

b) Open Fields, Vacant Lots and Wetlands

Soil samples were collected to a depth of six (6) inches from the open fields and vacant lots and eight (8) inches from the wetlands at the locations shown on Figure 2-2. Additional three (3) samples were collected at depths of 6 to 12 inches at one open field (Lot #1) and 8 to 16 inches for the wetlands.

Tables 2-4 (A and B) and 2-5 sumarize soil PCB concentrations in open fields and wetlands respectively.

2.2.3.3 Sewage Lift Station

Two (2) 24-hour composite samples of the wastewater and two (2) additional samples during low sanitary sewage flow at night were collected from the sewage lift station. The location of the sewage lift station is shown on Figure 1-2.

PCB concentrations in the sewage lift station are provided in Table 2-6. Since PCB was not detected in the sewage samples, it is concluded that there is no off-site migration of PCB through the sanitary sewer system.

2.2.3.4 Septic Tanks

Based on discussions with local homeowners and a septage hauler who worked at the site prior to construction of the sanitary sewer, most of the septic tanks have been abandoned and filled in. Only five (5) septic tanks could be located and only three of them were accessible for sampling of sludge from the tank

TABLE 2-2

SUMMARY OF PCB CONCENTRATIONS
IN SOIL FROM FRONT YARDS

PCB Concentration (mg/kg)
Soil Sample Location

House No.	01	02	03	04	05	06	07
01	<1	1.2	51.2 (18.3)	1.5	<1	<1	-
02	6.3	5.8	5.7	1.1	2.6	<1	-
03	37.9 (1.25)	19.7 (11.3)	<1	1.4	<1	5.5	-
04	1.4	1.5	<1	<1	<1	<1	5.3
05	1.6 (1.3)	43.9 (3.0)	3.5	<1	5.2	1.1	-
06	2.5	11.8	1.5	4.3	1.4	<1	-
07	2.0	2.8	1.5	<1	2.1	1.1	-
08	4.3	2.9	<1	<1	<1	<1	-
09	3.2	4.8	<1	<1	<1	1.5	-
10	<1	2.1	<1	<1	<1	3.2	-
11(3)	<1	26.5 (9.0)	<1	2.1	<1	1.0	-
12	<1	<1	1.0	1.5	<1	<1	-

NOTES:

1. Figures shown in parenthesis indicate PCB concentrations from soil samples collected at depths of 6 to 12 inches

2. Soil sample location coordinates are identified in the Survey (Ref. 8) with the designation F xx xx where the first 2 digits after the letter indicate house numbers and last two digits indicate the sample number

3. Soil sample also taken under these houses which are supported on cinder blocks. PCB concentrations measured in soil under Houses 11, 32, 38 and 46 wee respectively less than 1.0, 14.8, 1.05 and less than 1.0 mg/kg.

TABLE 2-2 (Cont'd)

SUMMARY OF PCB CONCENTRATIONS
IN SOIL FROM FRONT YARDS

PCB Concentration (mg/kg)
Soil Sample Location

House No.	01	02	03	04	05	06	07
13	74.6 (2.61)	3.4	2.8	<1	<1	<1	4.9
14	3.9	<1	1.8	<1	<1	<1	-
15	14.9	3.9	4.9	4.7	7.5	11.9	-
16	396.0 (228.0)	<1	<1	<1	<1	<1	-
17	2.3	16.3 (1.7)	2.4	7.5	<1	<1	-
18	13.6	2.3	3.8	<1	1.6	<1	-
19	1.2	2.5	<1	<1	<1	<1	-
20	3.2	20.5 (<1)	5.5	10.7 (5.8)	2.2	8.1	-
21	<1	3.8	6.7	1.2	<1	5.4	-
22	16.0	4.1	26.7 (<1)	3.1	4.3	<1	-
23	7.3 (6.4)	7.9	7.3	32.0 (2.1)	9.5	7.3	-
24	5.9	1.0	1.9	<1	<1	<1	-
25	3.7	1.3	<1	1.6 (<1)	56.6 (2.3)	10.6 (2.6)	-
26	1.4	<1	4.6	<1	4.2	<1	-
27	2.0	12.6 (2.9)	<1	<1	11.3 (<1)	<1	-
28	21.6 (1.1)	<1	5.6	<1	<1	<1	-
29	<1	<1	<1	<1	<1	<1	-
30	4.2	5.1	<1	<1	13.3	<1	-

TABLE 2-2 (Cont'd)

SUMMARY OF PCB CONCENTRATIONS
IN SOIL FROM FRONT YARDS

PCB Concentration (mg/kg)
Soil Sample Location

House No.	01	02	03	04	05	06	07
31	<1	8.8	<1	1.4	59.3 (13.3)	196.8	-
32(3)	4.8	149.0 (36.2)	113.0 (12.1)	39.7 (<1)	38.0	<1	-
33	283.0 (12.4)	77.2 (30.6)	82.0 (175.1)	5.2	9.0	<1	-
34	6.7	10.1	3.5	<1	<1	<1	-
35	7.9	3.0	11.6	1.1	<1	<1	
36	721.0 (11.4)	15.7	288.0 (23.1)	1.4	1.9	193.0	1.9
37	21.3 (12.4)	7.4	14.0	<1	6.1	4.0	-
38(3)	194.1 (12.27)	7.5	71.2 (1.9)	11.3	1.4	<1	-
39	5.4	1.7	1.6	<1	<1	<1	-
40	<1	<1	31.9 (4.0)	<1	<1	<1	-
41	3.9	<1	<1	<1	<1	<1	-
42	<1	<1	<1	<1	<1	1.3	-
43	66.0 (33.0)	<1	8.6	<1	<1	<1	7.8
44	6.6	1.3	3.9	5.5	<1	1.8	5.1
45	<1	3.1	<1	<1	<1	<1	-
46(3)	3.7	3.9	9.0	<1	<1	<1	-
47	4.4	2.5	4.0	7.2	<1	<1	-
48	<1	<1	<1	<1	<1	<1	3.5
49	<1	<1	<1	1.6	<1	<1	-

TABLE 2-2 (Cont'd)

SUMMARY OF PCB CONCENTRATIONS
IN SOIL FROM FRONT YARDS

House No.	PCB Concentration (mg/kg) Soil Sample Location 01	02	03	04	05	06	07
50	1.8 (<1)	16.2 (9.7)	1.3	6.5	2.7	2.8	-
51	2.1	1.5	6.3	2.2	1.4	1.2	-
52	1.8	4.9	1.6	2.6	1.9	<1	-
53	1.8	1.4	6.9	<1	<1	<1	-
54	7.4	23.2	11.7	1.0	2.0	<1	21.1
55	-	-	-	-	-	-	-
56	4.4	1.7	2.9	<1	<1	<1	-
57	3.9	<1	1.2	<1	<1	<1	-
58	9.0	<1	3.4	<1	<1	<1	-
59	2.0	66.3 (8.6)	1.8	1.0	3.9	1.7	154.0
60	4.5	<1	<1	<1	<1	<1	3.3

TABLE 2-3

SUMMARY OF PCB CONCENTRATIONS
IN SOIL FROM BACKYARDS

	PCB Concentration (mg/kg) Soil Sample Location			
House No.	1	2	3	4
1	<1	<1	<1	<1
2	<1	<1	<1	<1
3	<1	<1	2.8	<1
4	<1	<1	<1	<1
5	<1	<1	<1	<1
6	<1	<1	1.3	<1
7	<1	1.2	<1	<1
8	<1	<1	<1	<1
9	<1	<1	<1	<1
10	<1	<1	<1	<1
11	<1	<1	<1	<1
12	1.55	<1	<1	<1
13	<1	<1	<1	<1
14	<1	<1	<1	<1
15	1.33	1.90	<1	<1
16	<1	<1	<1	<1
17	<1	<1	<1	<1

NOTES

1. Figures in parenthesis indicate PCB concentrations from soil samples collected at depths of 6 to 12 inches.

2. Soil sample location coordinates are identified in the Survey (Reference 8) with the designation B xx xx where the first 2 digits after the letter indicate house number and the last two digits indicate sample number.

TABLE 2-3 (Cont'd)

SUMMARY OF PCB CONCENTRATIONS
IN SOIL FROM BACKYARDS

House No.	PCB Concentration (mg/kg) Soil Sample Location 1	2	3	4
18	<1	<1	<1	<1
19	<1	<1	<1	<1
20	<1	<1	2.3	<1
21	<1	<1	<1	<1
22	2.4	2.4	<1	1.1
23	<1	<1	<1	1.2
24	<1	<1	<1	<1
25	<1	<1	<1	<1
26	<1	<1	<1	4.9
27	<1	<1	<1	<1
28	<1	1.2	<1	<1
29	<1	<1	<1	<1
30	<1	<1	<1	<1
31	<1	1.2	<1	<1
32	<1	<1	<1	<1
33	<1	<1	3.4	<1
34	1.2	<1	<1	<1
35	<1	<1	<1	<1
36	-	-	-	-
37	1.3	1.7	5.7	4.0

TABLE 2-3 (Cont'd)

SUMMARY OF PCB CONCENTRATIONS
IN SOIL FROM BACKYARDS

	PCB Concentration (mg/kg) Soil Sample Location						
House No.	1	2	3	4	5	6	7
38	<1	<1	1	<1	-	-	-
39	<1	<1	<1	<1	-	-	-
40	<1	<1	<1	<1	-	-	-
41	<1	<1	<1	1.6	-	-	-
42	<1	<1	<1	<1	-	-	-
43	1.2	<1	<1	<1	-	-	-
44	39.2	<1	-	-	-	-	-
45	<1	<1	2.8	<1	-	-	-
46	<1	<1	<1	<1	-	-	-
47	<1	<1	<1	<1	-	-	-
48	<1	<1	<1	<1	-	-	-
49	<1	<1	<1	<1	<1	-	-
50	17.0 (10.7)	14.4 (1.4)	6.4	3.4	19.2 (28.2)	<1 (1.2)	<1 (<1)
51	25.7	<1	<1	<1	-	-	-
52	<1	<1	<1	<1	-	-	-
53	<1	<1	<1	<1	-	-	-
54	<1	<1	<1	<1	-	-	-
55	-	-	-	-	-	-	-
56	9.6 (3.9)	1.9	5.1	5.2	-	-	-
57	<1	<1	<1	<1	-	-	-
58	<1	1.8	1.0	3.3	-	-	-
59	<1	<1	<1	3.6	-	-	-
60	<1	2.5	<1	<1	-	-	-

7450b

TABLE 2-4A

SUMMARY OF PCB CONCENTRATIONS
IN SURFACE SOIL (0-6") FROM OPEN LOTS

Lot No.	PCB Concentration (mg/kg) Soil Sample Locations 01	02	03	04	05
V-01	19.4	2.4	<1	2.1	-
V-02	53.8	3.1	-	-	-
V-03	42.9	2.8	2.8	1.7	-
V-04	15.5	1.1	-	-	-
V-05	222.0	991.0	232.4	2.3	-
V-06	102.0	10.7	3.3	2.1	-
V-07	20.8	4.0	-	-	-
V-08	29.4	54.0	7.6	2.8	1.4
V-09	33.9	16.7	5.9	4.1	2.2
V-10	<1	3.1	<1	<1	<1
V-11	5.4	<1	<1	<1	<1
V-12	16.3	25.4	-	-	-
V-13	1.9	<1	-	-	-
V-14	1.2	<1	-	-	-
V-15	187.0	9.3	-	-	-

NOTES

1. Soil sample location coordinates are identified in the Survey (Ref. 8)with the designation V xx xx where the first 2 digits after the letter indicate the lot number and the last two digits indicate the sample number.

TABLE 2-4A (Cont'd)

SUMMARY OF PCB CONCENTRATIONS
IN SURFACE SOIL (0-6") FROM OPEN LOTS

Lot No.	PCB Concentration (mg/kg) Soil Sample Locations 01	02	03	04	05
V-16	162.0	15.2	-	-	-
V-17	371.0	3.5	-	-	-
V-18	13.5	5.2	-	-	-
V-19	147.0	9.0	-	-	-
V-20	12.5	89.5	-	-	-
V-21	154.2	126.0	-	-	-

7450b

TABLE 2-4B

SUMMARY OF PCB CONCENTRATIONS
IN SOIL FROM OPEN LOTS SHOWN
ON FIGURE 2-2

Lot #	Location	PCB Concentration (mg/kg) (0-6")	(6-12")
1	S0-01-A	6.6	5.2
1	S0-01-B	5.9	8.2
1	S0-01-C	13.7	58.6
2	S0-02-A	2.1	-
2	S0-02-B	1.5	-
2	S0-02-C	4.6	-
2	S0-02-D	8.5	-
2	S0-02-E	3.2	-
2	S0-02-F	4.7	-
2	S0-02-G	4.0	-
2	S0-02-H	4.2	-
2	S0-02-I	1.0	-
2	S0-02-J	3.2	-

NOTES

1. Soil sample location coordinates are identified in the survey (Ref. 8) with the designation 0 x for Lot #1 and O 02 x for Lot #2 where x indicates the letter assigned to the sample location.

TABLE 2-5

SUMMARY OF PCB CONCENTRATIONS
IN SOIL FROM WETLANDS

Location	PCB Concentration (mg/kg) (0-8")	(8-16")
SW-01	11.0	<1
SW-02	26.5	1.9
SW-03	24.6	<1
SW-04	26.7	12.7
SW-05	5.5	2.2
SW-06	<1	5.8

NOTES

1. Soil sample location coordinates are identified in the Survey (Ref. 8) with the designation W ox where x indicates the sample number.

TABLE 2-6

SUMMARY OF PCB CONCENTRATIONS IN SEWAGE LIFT STATION

DATE	TIME	PCB CONCENTRATION, ug/l
11-17-86	0800-0800	<1
	0000-0400	<1
11-19-86	0800-0800	<1
	0000-0400	<1

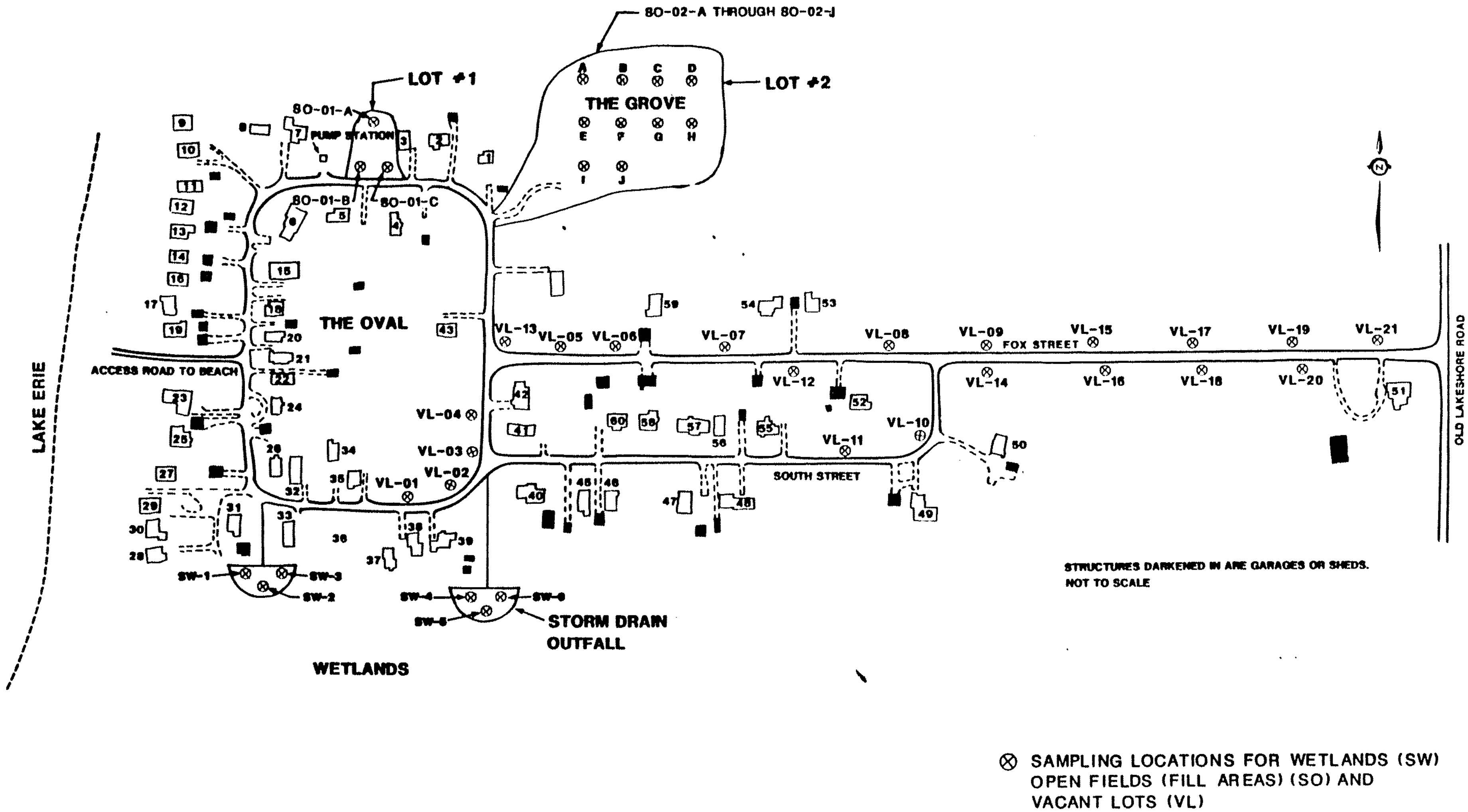


FIGURE 2–2

SAMPLING LOCATIONS
FOR WETLANDS, OPEN FIELDS AND VACANT LOTS

(i.e. Houses 26, 31 and 46). PCB concentrations in the septic tanks are provided in Table 2-7. The PCB concentration were less than 10 mg/kg. Based on the sample data and fact that the old tanks have been abandoned, there is no need for any remediation of septic tanks at the Wide Beach Site.

2.2.3.5 Sewer Trench Bedding and Surrounding Soil

Soil boring and sampling was conducted at five (5) sewer trench locations as shown in Figure 2-3. Two (2) to three (3) borings were made at each location and one (1) to three (3) soil samples were collected from each boring to a depth as shown in Figure 2-4.

PCB concentrations in the sewer trench bedding material and surrounding soil are provided in Table 2-8. Based on the minimal concentration levels indicated, it can be concluded that no remediation of the sewer trench soil is necessary.

2.2.3.6 Perched Water in Sanitary Sewer Trench

Figure 2-5 shows the hydraulic profile of the perched water and the sanitary sewer trench and the location of the sewer monitoring wells along the trench. A section of the sewer trench between monitoring wells SW-4 and SW-5 was installed in the bedrock which consists of a fractured shale. The bedrock is saturated with groundwater, and it is believed that the excavation into bedrock has caused an artesian upflow which forms a perched water condition in the trench resulting in water levels higher than the normal water table outside the sewer trench. The perched water accumulates and is confined in the trench between SW-4 and SW-5 and between SW-1 and SW-5. The sewer trench is surrounded by low permeable clay soil with hydraulic conductivity in the range of 3.4×10^{-4} to 8×10^{-6} cm/sec (Appendix B, Hydrogeology of Sewer Trench). The movement of the perched water is very slow since the hydraulic gradient is less than 0.002 from SW-5 towards SW-4. Off-site migration of PCBs via the sewer trench is judged to be minimal since the perched water is essentially stagnated in an equilibrium condition and any flow in the trench is directed to the low point at SW-4. Any withdrawal of perched water would be recharged by an upward flow from the bedrock under the sewer trench between SW-4 and SW-5. The estimated volume of water in the sewer trench including the perched water is approximately 80,000 gallons.

The following summarizes the site conditions:

1. The perched water condition in the sewer trench is caused by a section of sanitary sewer trench that cuts into the bedrock aquifer at the site.

TABLE 2-7

SUMMARY OF PCB CONCENTRATIONS FROM SEPTIC TANKS

House No.	PCB Concentration, ug/kg
31	<400
26	<300
46	<390

TABLE 2-8

SUMMARY OF PCB CONCENTRATIONS FROM SEWER TRENCH BEDDING MATERIAL

Location	Depth (ft)	PCB Concentration (mg/kg)
ST-1A	0.5 - 2.5	7.85
	2.5 - 4.5	<1
ST-1B	4.5 - 6.5	<1
	6.5 - 8.5	<1
ST-1C	4.5 - 6.5	<1
	6.5 - 8.5	<1
ST-2A	0.5 - 2.0	<1
	2.0 - 4.0	<1
	4.0 - 6.0	<1
ST-2B	6.0 - 8.0	<1
	8.0 - 10.0	<1
ST-2C	6.0 - 8.0	<1
	8.0 - 10.0	<1
ST-4A	0.5 - 2.5	<1
	2.5 - 4.5	5.9
	4.6 - 6.5	<1
ST-4B	10.0 - 12.0	<1
ST-4C	6.0 - 8.0	<1
	8.0 - 10.0	<1
	10.0 - 12.0	<1
ST-5A	0.5 - 2.5	7.4
	2.5 - 4.5	1.7
	4.5 - 6.5	1.0
	6.5 - 8.5	2.0
ST-5C	1.00 - 11.3	<1
ST-7A	0.5 - 2.0	4.8
	2.0 - 4.0	<1
	4.0 - 6.0	2.2
ST-7B	6.0 - 8.0	<1
	8.0 - 10.0	<1
ST-7C	6.0 - 8.0	<1
	8.0 - 10.0	<1

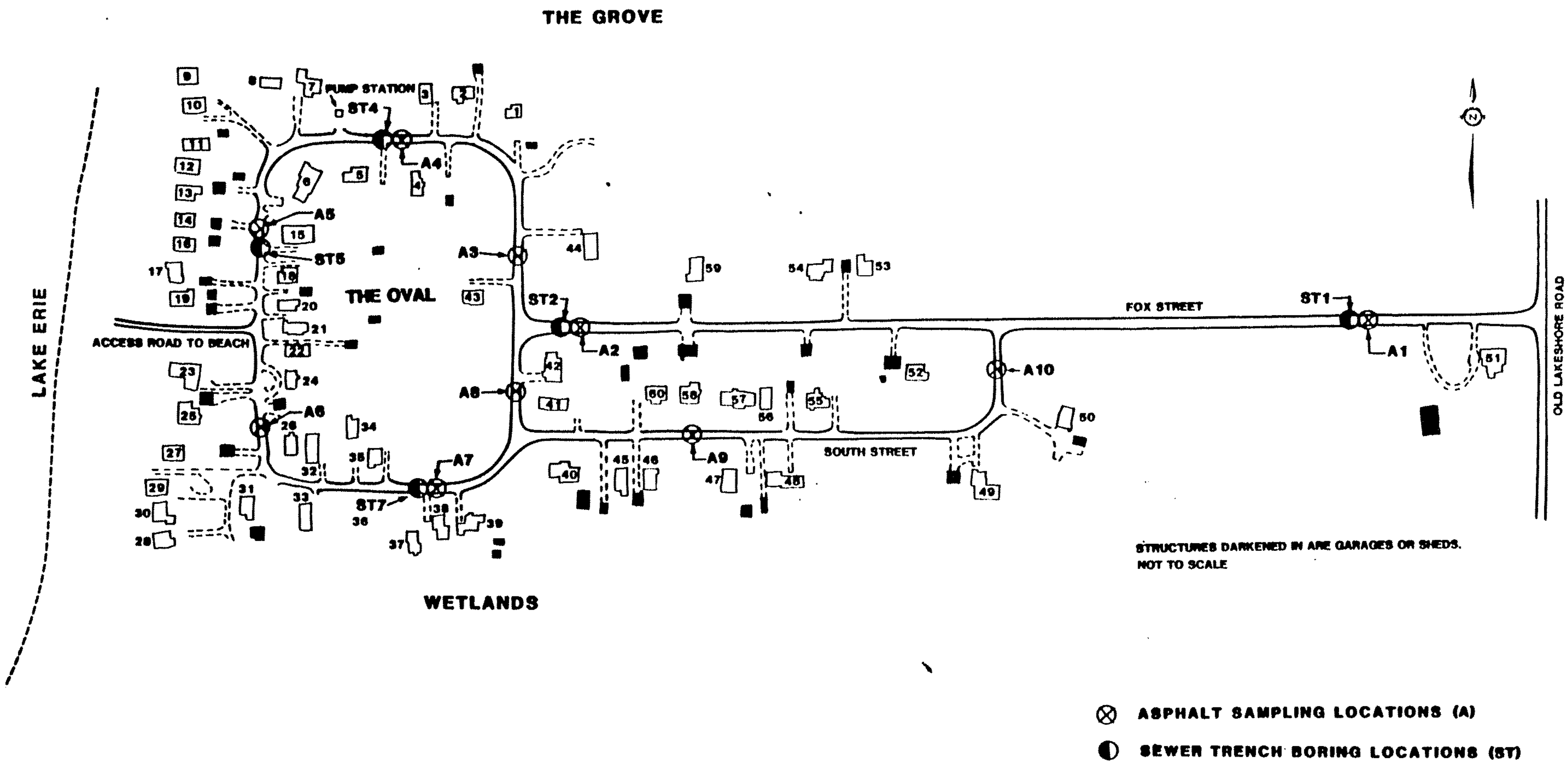


FIGURE 2–3

ASPHALT SAMPLING LOCATIONS
AND SEWER TRENCH BORING LOCATIONS

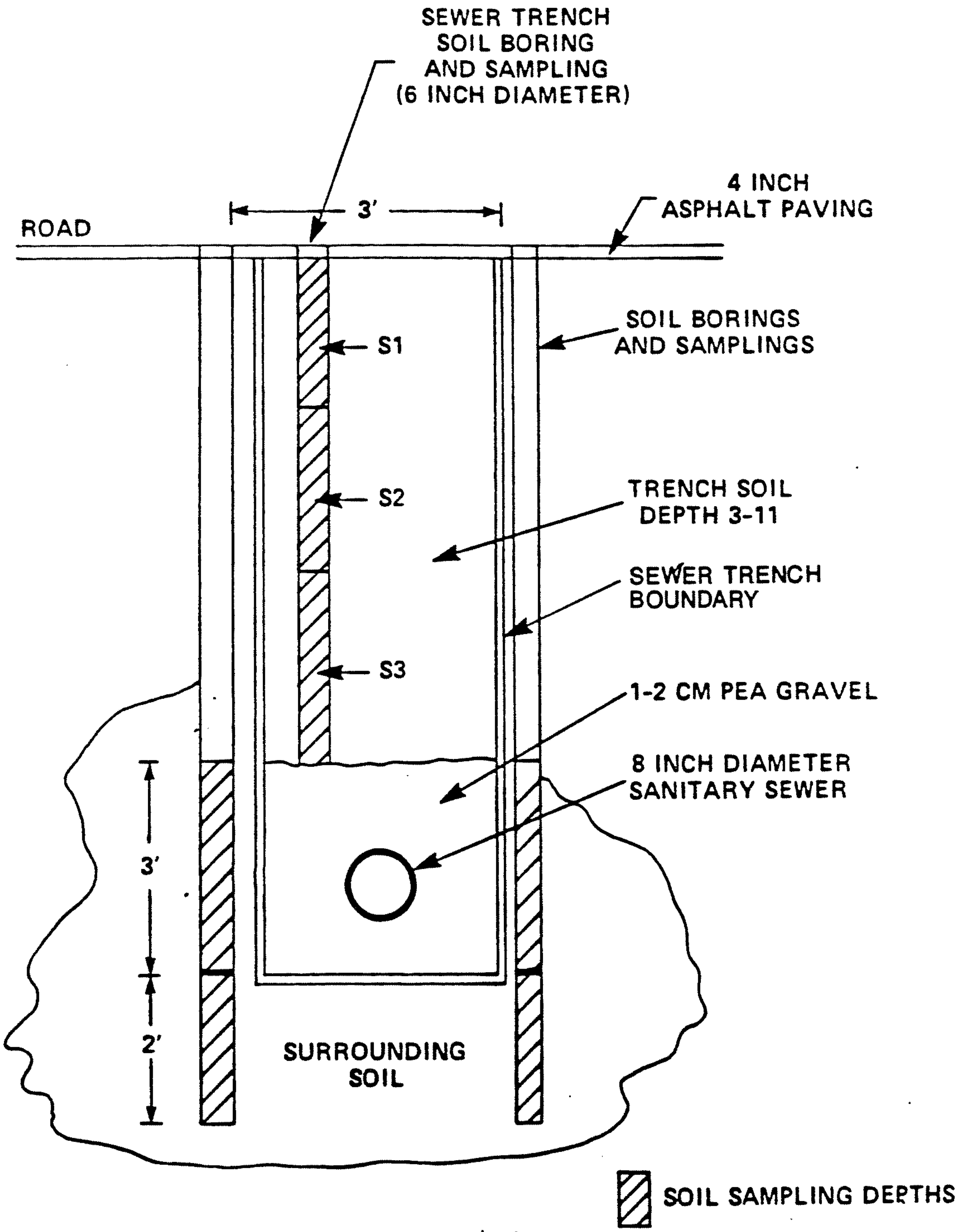


FIGURE 2-4
SEWER TRENCH BORINGS AND SOIL SAMPLING

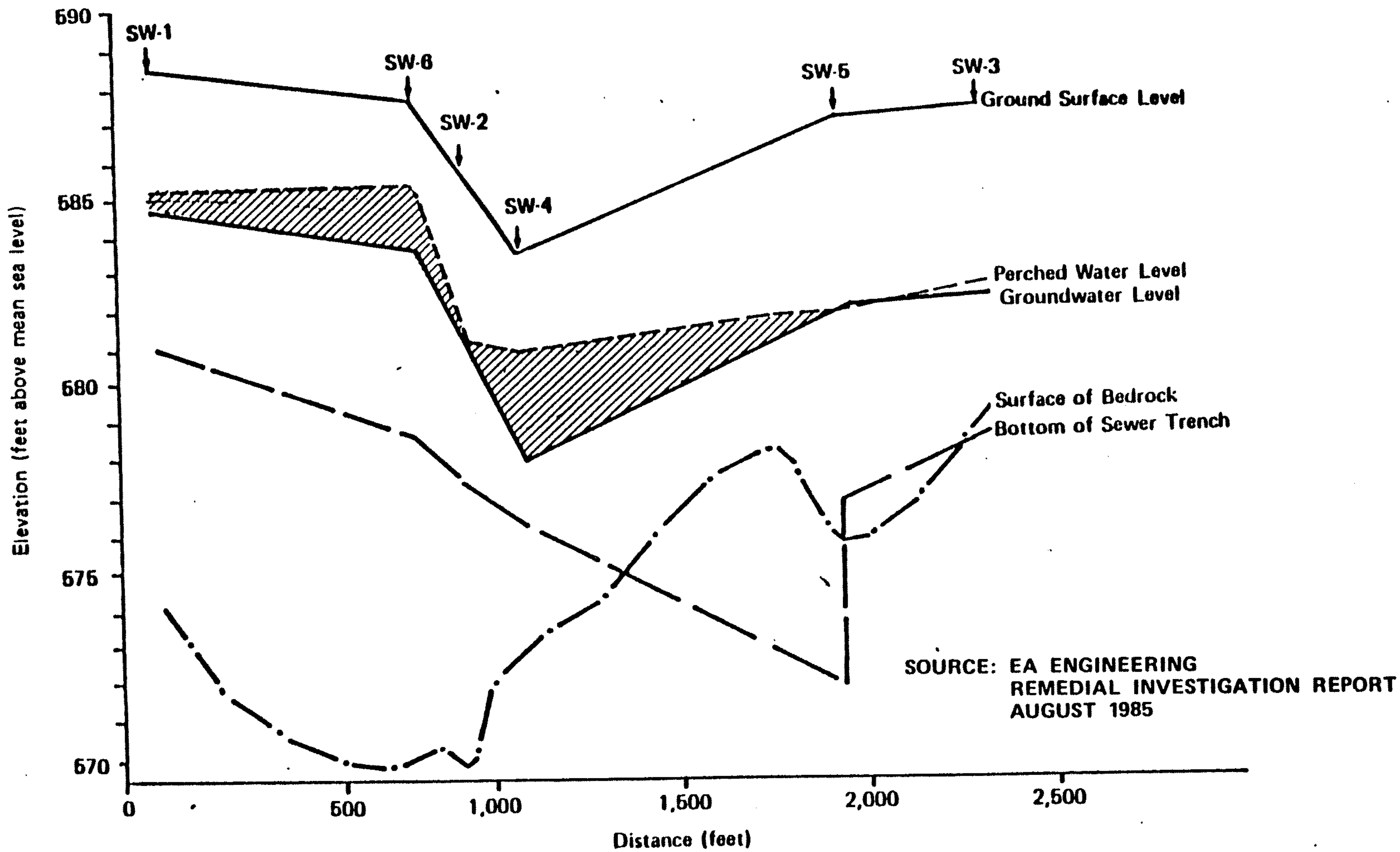


FIGURE 2—5 Topographic profile along the sewer trench

2. There is negligible off-site migration of PCB via the sewer trench due to the following:

   - Hydraulic gradient is in direction of SW-4 and not off-site to the north near the sewage pumping station

   - Perched water is stagnated in an equilibrium condition

Samples were collected from the sewer trench wells in December, 1986. Only four wells (SW-3, SW-4, SW-5 and SW-6) could be sampled to obtain perched water. SW-1 and SW-2 had been removed. Samples from SW-6 were excluded from treatability tests due to the very slow recovery after purging, which makes future pumping of well water for treatment impracticable. Well water samples were visually inspected in the field. SW-4 sample had high turbidity and some noticeable oil. SW-3 and SW-5 samples contained lower turbidity and suspended solids and no visible oil. Ebasco was concerned that higher concentrations of suspended solids would contain higher concentrations of PCBs and therefore selected two samples, instead of the one composite sample as originally planned for treatability testing. Both samples were sent to Ebasco's laboratory in Columbia, MD for treatability tests. The two samples were the SW-4 well water and a composite of the SW-3 and SW-5 well waters.

Table 2-9 presents the results of chemical analysis of the two perched water samples analyzed. It should be noted that Well SW-4 had a high concentration of suspended solids at 3856 mg/l and PCB of 68 ug/l while the composite of the other two wells had a TSS of 228 ug/l and PCB of 4.3. Historic data for PCB concentrations were below 10 ug/l.

Due to the unexpected high levels of suspended solids and PCBs in the sewer trench wells, a second round of samples were collected in January 1987 to determine if the initial samples were representative. The well water samples were composited. The results of the second-round samples showed lower concentrations of suspended solids and PCBs of less than 1 ug/l. It was suspected that the SW-4 sample collected in December 1986 was contaminated by surface water runoff as a result of EPA's cleanup of accumulated water in a drainage ditch. These cleanup activities occurred a week or so prior to the sampling.

TABLE 2-9

ANALYSES OF SEWER TRENCH PERCHED WATER

	Well SW-4 Sampled 12/86	Composite of Wells SW-3 & 5 Sampled 12/86 (Comp -1)	Composite of Wells SW-3,4&5 Sampled 1/87 (Comp -2)
Total PCB (mg/l)	68	4.3	<1.0
TOC (mg/l)	59	39	-
TSS (mg/l)	3856	228	159
COD (mg/l)	506	41	-
Alkalinity (mg/l)	272	204	-
Iron (mg/l)	60.2	11.9	0.26
Oil and Grease (mg/l)	-	-	<3.0
BOD_5 (mg/l)	7	7	-
TDS (mg/l)	460	-	520

PCB = Polychlorinated biphenyl (Aroclor 1254)
TOC = Total organic carbon
TSS = Total suspended solids
COD = Chemical oxygen demand
BOD-5 = Biochemical oxygen demand (5-day)
TDS = Total dissolved solids

The results of the Perched Water Treatability Study (Reference 7) concluded that the PCBs in the perched water samples were adsorbed to the suspended solids in the water samples taken from the sewer trench wells. PCBs were reduced to less than 1 ug/l when the sample was treated to remove the suspended solids. The suspended solids were removed from the water by chemical coagulation, flocculation, sedimentation and by centrifugation. A second round of sampling of the sewer trench wells showed lower suspended solids levels and PCB concentration less than 1 ug/l without any treatment of the water samples.

The perched water hydrogeology conditions are described in Appendix B indicate that there is negligible off-site migration of PCB via the sewer trench due to the following:

- o Hydraulic gradient is in the direction of SW-4 and not off-site to the north near the sewage pumping station.
- o The perched water is stagnated in an equilibrium condition.
- o The PCBs are adsorbed to the soil and not leaching to the groundwater.

Based on the treatability results and perched water hydrogeologic conditions, it was concluded that remediation or draining of the perched water is not required. As discussed in Section 2.2.3.5 above no treatment of the sewer trench soil is required.

2.2.3.7 Asphalt Pavement

Core samples of the 4-inch asphalt pavement were obtained for PCB analysis from ten (10) locations as shown in Figure 2-3. Selected core sampes were segmented into one to two-inch layers and analyzed for PCB concentration depthwise.

Results of PCB concentrations in the asphalt samples are provided in Table 2-10. Based on the minimal concentration levels indicated, it can be concluded that decontamination of asphaltic material is not required.

2.3 GEOTECHNICAL SOIL BORINGS AND SURVEY

2.3.1 Geotechnical Soil Borings

A total of ten (10) geotechnical soil borings were made at the site by Ebasco as shown on Figure 2-6 to develop engineering design data. The results of laboratory tests for moisture content and Atterberg limits are provided in Table 2-11. Soil boring logs are given in Appendix A.

2.3.2 Survey

Site surveys were performed to establish the vertical and horizontal controls at the site, to provide the existing conditions of the roadways, ditches, and driveways, and to identify the locations of the geotechnical soil borings and PCB sampling stations.

The field data for these surveys are provided in Reference 8. These data will be used in developing remedial design drawings discussed in Section 5.3.

TABLE 2-10

SUMMARY OF PCB CONCENTRATIONS FROM ASPHALT PAVEMENT SAMPLING LOCATIONS SHOWN ON FIGURE 2-3

Location	Depth (in)	PCB Concentration (mg/kg)
A1	0 - 2	<1
	2 - 4	<1
A2	0 - 2	<1
	2 - 4	1.1
A3	0 - 2	1.2
	2 - 4	<1
A4	0 - 1	1.3
	1 - 2	<1
	2 - 3	<1
	3 - 4	<1
A5	0 - 1.5	1.2
	1.5 - 3	<1
A6	0 - 1	<1
	1 - 2	<1
	2 - 3	<1
	3 - 4	<1
A7	0 - 1	<1
	1 - 2	<1
	2 - 3	<1
A8	0 - 2	<1
	2 - 5	<1
A9	0 - 2	<1
	2 - 4	<1
A10	0 - 3	1.5
	3 - 4	<1

TABLE 2-11

SUMMARY OF TEST RESULTS OF GEOTECHNICAL BORING SOIL SAMPLES FROM LOCATIONS SHOWN ON FIGURE 2-6

A. Atterberg limits and Moisture Content

LOCATION	DEPTH (ft)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	MOISTURE CONTENT (%)
EN-01	5-7	28	20	8	19.0
EN-02	0-2	27	22	5	24.1
EN-03	0.5-2.5	29	23	6	22.7
EN-04	0.5-2.5	32	26	6	22.5
EN-05	5-5.5	31	21	10	9.1
EN-06	5-6	29	22	7	9.0
EN-07	5-5.5	29	21	8	18.0
EN-08	0.5-2.5	30	23	7	29.7
EM-09	5-7	31	22	9	20.9
EN-10	0-2	31	23	8	23.5

TABLE 2-11 (Cont'd)

SUMMARY OF TEST RESULTS OF GEOTECHNICAL BORING
SOIL SAMPLES FROM LOCATIONS SHOWN ON FIGURE 2-6

B. PCB Concentration

LOCATION	DEPTH (ft)	PCB CONCENTRATION (mg/kg)
EN-01	0 - 6	<1
EN-02	0 - 6	<1
EN-03	0 - 6	<1
EN-04	0 - 6	<1
EN-05	0 - 6	<1
EN-06	0 - 6	<1
EN-07	0 - 6	122.0
EN-08	0 - 6	1.0
EN-09	0 - 6	2.4
EN-10	0 - 6	4.1

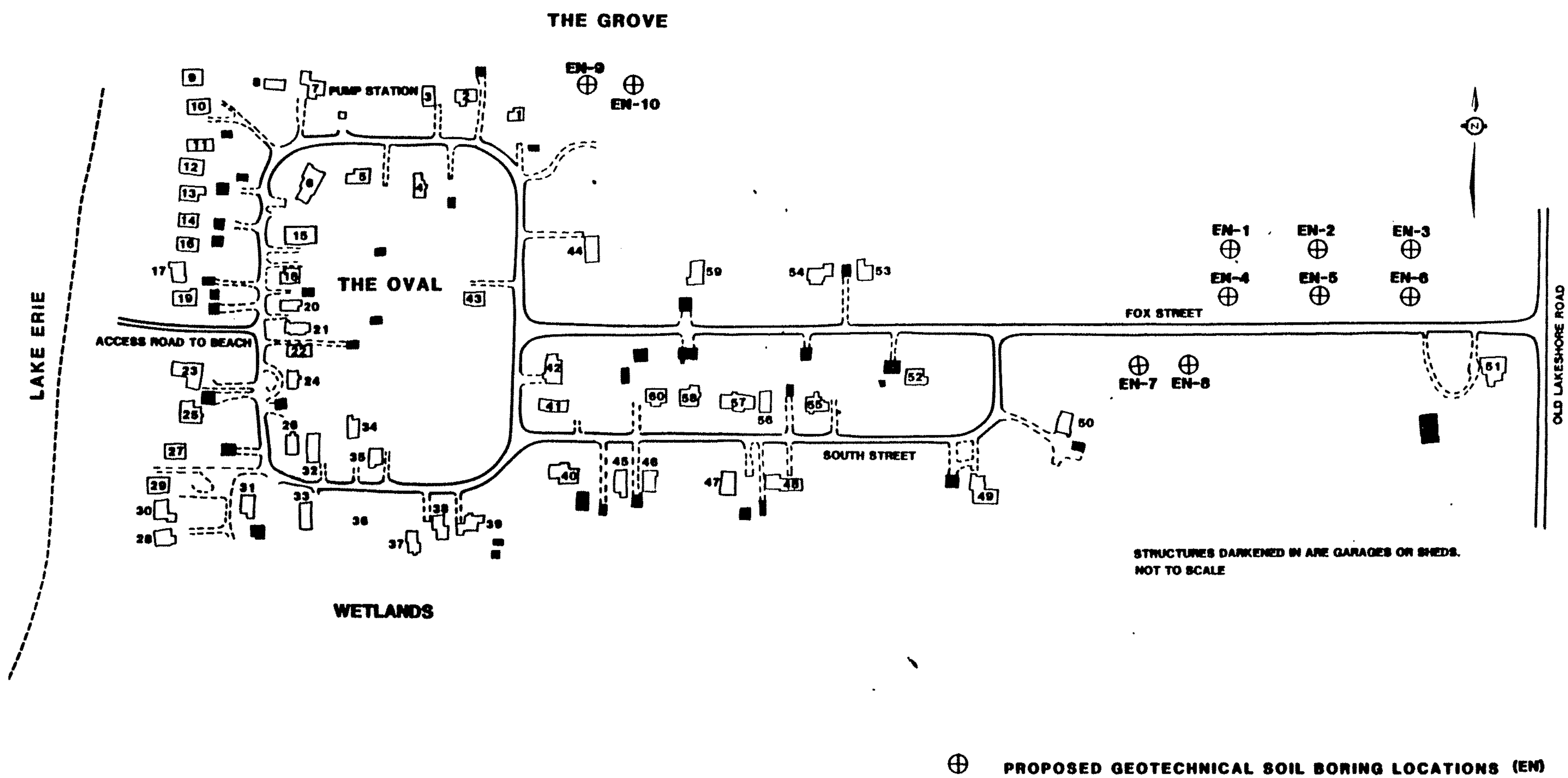


FIGURE 2–6

LOCATIONS FOR GEOTECHNICAL BORINGS

3.0 REGULATORY REQUIREMENTS

3.1 FEDERAL AND LOCAL REGULATIONS

3.1.1 General

This section provides preliminary determination of the Federal and New York State environmental and public health requirements, which are applicable or relevant and appropriate to the Wide Beach site, and the extent to which other Federal and New York State criteria, advisories and guidance are to be used in developing the remedial design for the remedies recommended by the ROD. This determination is required by CERCLA Section 121 and Section 300.68(c)(1) of the National Contingency Plan (NCP).

The NCP and the EPA Interim Guidance define applicable requirements as the Federal requirements for hazardous substances that specifically address site circumstances, and that would be legally applicable at the site if this response were not undertaken under CERCLA. Relevant and appropriate requirements are defined as those Federal requirements that, while not applicable, are designed to apply to similar problems to those encountered at this site. Requirements may be relevant and appropriate if they would be applicable except for jurisdictional prerequisites associated with the requirment. With respect to the selection of remedial alternatives, relevant and appropriate requirements are to be afforded the same weight and consideration as applicable requirements.

3.1.2 Potential Applicable or Relevant and Appropriate Requirements

For each site work activity described in Section 4.0 a cross reference is provided for the associated design criteria to the regulatory requirements of this section which are expected to affect the activity.

Note that the entire remediation activities as a whole will be evaluated for consistency with the New York Coastal Zone Management Standards. The Wide Beach site is within New York's Coastal Zone. EPA Region II has developed an environmental review procedure for CERCLA/SARA projects in coastal zone areas. This procedure was not developed until early 1988, long after the RI/FS was executed and the ROD was signed. However, it is Ebasco's understanding that the Region II Environmental Impacts Branch (EIB) will be subjecting all NPL sites to a so-called "coastal zone consistency review". These are not expected to provide standards or criteria for individual site activities.

3.1.2.1 Location-Specific

a) Federal

1. Federal Coastal Zone Management Act: It is understood that some, if not all, of the Wide Beach site is within the area managed by the New York State Coastal Zone Management program. Federal projects which require a federal license or permit must be consistent with New York's coastal zone management plan.

2. Federal Floodplain and Wetlands Executive Orders: These Executive Orders are to be considered as implemented by EPA's August 6, 1985 policy on Floodplains and Wetlands Assessments for CERCLA Actions (CERCLA Compliance Policy).

b) New York State

1. New York State Freshwater Wetlands Standards: Some of the project area is within the jurisdiction of New York's Freshwater Wetlands Permit Program (Environmental Conservation Law Article 24 standards).

2. New York Flood Hazard Area Construction Standards: New York requires a permit to construct any develop- ment within the Federally identified 100-year flood plain of certain municipalities. Since the project area is within this jurisdiction, these standards are to be addressed.

3. New York Coastal Zone Management Standards: As discussed above, some of the site area is within the area managed by the New York State Coastal Zone Management program. These standards are to be addressed in the remedial program.

3.1.2.2 Action-Specific

a) Federal

1. TSCA Requirements Overview: EPA regulations controlling the disposal of PCBs (40 CFR 761) broadly define the term disposal to encompass accidental as well as intentional releases of PCBs to the environment. Under these regulations, EPA considers spills, leaks and other uncontrolled discharges of PCBs at concentrations of 50 parts per million (ppm) or greater, whether intentional or unintentional, improper disposal or PCBs. The term "spill" indicates the spilling, leaking or other uncontrolled discharging of PCBs, as well as the contamination resulting from those releases. When PCBs

are improperly disposed of as a result of a spill of 50 ppm or greater, EPA has the authority under section 17 of the Toxic Substance Control Act (TSCA) to compel persons to take actions to rectify damage or clean up contamination resulting from the spill. Therefore, the TSCA requirements specified below are applicable at the Wide Beach Site.

2. TSCA Requirements for PCB Disposal: Remedial activities will involve the excavation of PCB contaminated soils. PCBs resulting from the clean-up and removal of spills or other uncontrolled discharges must be disposed of in accordance with 40 CFR 761.60 (d) and 761.60 (a) (5). These regulations require that the chemical treatment process for removing PCBs from the Wide Beach site must be approved by EPA's Regional Administrator in Region II. The application must contain information indicating that disposal in an incinerator or chemical waste landfill is not resasonable and that the chemical treatment process will provide adequate protection to health and the environment. Additionally, the Regional Administrator will consider other EPA guidelines, criteria and regulations to ensure that the dredged PCB materials are adequately controlled to protect the environment.

3. TSCA Requriements for PCB Storage: The storage for disposal of PCB contaminated soil, pipes or asphalt will require compliance with 40 CFR 761.65. This regulation establishes criteria for storage facilities and prohibits construction at a site below the 100-year flood water elevation. However, containers of PCB contaminated soil and debris may be stored temporarily in a noncompliance area for up to thirty days from the date of removal for disposal.

4. TSCA Requirements for Decontamination of Treatment Containers: PCB containers used in the remediation activity must be decontaminated in compliance with 40 CFR 761.79.

5. TSCA Requirements for Off-Site Chemical Landfills: If remedial activities involve the removal of PCB contaminated pipes and asphalt to an offsite chemical waste landfill, the chemical waste landfill must be in compliance with 40 CFR 761.75.

6. Occupational Safety and Health Act (OSHA) Requirements: OSHA requirements are considered applicable to workers implementing the recommended remedial alternative.

7. <u>Rivers and Harbors Act Section 10/Clean Water Act Section 404 Standards</u>: Dredging/excavation activities in the wetlands area may fall within the "navigable waters of the U.S." governed by Section 10 of the Rivers and Harbors Act. If not, the broader "waters of the U.S." jurisdiction of Section 404 of the Clean Water Act is applicable. The USACOE standards are found at 33 CFR 320-330. The EPA guidelines for environmental suitability are found at 40 CFR 230-231.

8. <u>National Pollutant Discharge Elimination System (NPDES) Permit Conditions Under the Clean Water Act</u>: When treated process waters and stormwater is to be discharged any effluent from the treatment process or redeposited sediments will be regulated by a New York State SPDES permit for discharging off-site. The permit conditions may, for example, draw upon Federal technology-based treatment standards.

b) <u>New York State</u>

1. <u>New York Hazardous Waste Regulations</u>: Spill wastes containing 50 ppm or greater PCBs are classified as hazardous waste in New York. The storage and disposal of these wastes are regulated by 6 NYCRR 373 which requires that material contaminated by spills be sent to a licensed hazardous waste landfill.

2. <u>New York Air Pollution Control Regulations</u>: The chemical process used to remove the PCBs will result in the emission of organic vapors into the atmosphere. These emissions are regulated by New York air pollution regulations, 6 NYCRR 200.

3. <u>New York Section 401 Certification Standards</u>: Under Section 401 of the Clean Water Act, New York evaluates the effect of activities affecting navigable waters to determine if a contravention of state water quality standards will occur. These standards are to be considered for on-site activities.

4. <u>New York State Pollutant Discharge Elimination System (SPDES) Standards, Water Quality Standards</u>: SPDES standards are to be considered regarding discharge of redeposited sediment and liquid waste streams from waste treatment, redirected stormwater, and any discharge off the site requires that SPDES permits are obtained prior to such activities.

5. <u>New York State Dredge and Fill, Work in Navigable Water, Streambed or Bank Disturbance Standards</u>: New York issues several permits related to dredging/ filling, excavation and other work in the waters of the state, under Article 15 of the Environmental Conservation Law. The standards utilized in evaluating these activities are to be considered for remediation activities affecting the water, wetlands and submerged land at the site.

4.0 REMEDIAL DESIGN - SITE WORK

4.1 REMEDIAL DESIGN OBJECTIVES

The remedial design objectives are to develop the appropriate technical specifications, drawings, construction schedule and cost estimates that are necessary to implement the selected remedies required by the ROD. Based on the conclusions derived from the supplemental investigations conducted by Ebasco as discussed in Section 3.1, the following remediation activities are identified as meeting the intent of the ROD:

- o Excavation of asphalt pavements from the roadways, drainage ditches, and driveways.
- o Excavation of PCB-contaminated soils in the roadways, drainage ditches, driveways, front yard, back yards and wetlands.
- o Chemical treatment of PCB-contaminated soils;
- o Improvement of site drainage.
- o Use of the treated soils as fill in the excavated areas.
- o Repavement of the roadways and driveways considering reuse of excavated asphaltic material.
- o Revegetation

The remedial design will be based on effectively meeting the following soil, air, ground water, and surface water remedial response levels for PCB concentrations:

- o Soil: <10 mg/kg (EPA/NYSDEC Soil Removal Criterion)
- o Air: <1.67 ug/m^3 (NYS Ambient Air Level)
- o Ground Water: <1.0 ug/l (NYS DOH Advisory Level)
- o Surface Water: $<7.9 \times 10^{-5}$ ug/l (CWA Ambient Water Quality Criteria For 10^{-6} Lifetime Cancer Risk)

Ebasco will prepare a technical bid package for use by the USACOE for the selection of a general contractor to provide design and construction services. The technical bid package will be developed using data collected during the RI/FS and supplemental site investigation phases of the project and the design criteria established in this Basis of Design Report. Included in the technical bid package are technical specifications, drawings, schedules and cost estimates.

4.2 GENERAL SEQUENCE OF REMEDIATION ACTIVITIES

The general sequence of remediation activities is given herein to aid in identifying design considerations appropriate to each activity and interactions that may exist among various activities. It is currently estimated that a duration of approximately 12 months is required to complete the chemical treatment of contaminated soils. If the treated soils are used as the primary source for backfills, the rate of treatment of soils will control the progress of excavation, filling, grading, and repaving activities. Due consideration shall be given to the logistics of the overall remediation efforts that involve possible temporary relocation of residents and traffic control in relation to the planned construction sequence and schedule.

The general sequence of remediation activities is as follows:

1. Obtain the necessary approvals prior to commencing work

2. Public advisories and construction Mobilization.

3. Clear areas required for construction facilities, grade and compact access routes.

4. Implement erosion and sediment control measures.

5. Construct site facilities

6. Excavate asphalt pavement and contaminated soils starting with areas of higher elevation

7. Perform post-excavation soil sample tests

8. Make necessary improvements to drainage systems

9. Treat contaminated soil

10. Backfill and rough grade

11. Provide final grading

12. Repave roadways and driveways

13. Revegetate excavated areas

14. Decontamination and off-site disposal of contaminated waste.

15. Project closeout and demobilization

4.3 SITE PREPARATION AND SITE FACILITIES

4.3.1 Description

Site preparation shall include clearing, grubbing and rough grading as required to provide clear level areas for the installation of the following facilities:

- Site Offices
- Parking Facilities
- Access Control and Fencing
- Decontamination Facilities
- Equipment Yard
- Chemical Treatment Plant
- Utilities
- Stockpiling Areas

All facilities shall be located within the Wide Beach Development limits. Access to the site for these facilities shall be obtained from the land owners through negotiations with the EPA.

Site offices, parking facilities, and an access control check point will be located as close as practicable to the east end of Fox Street - the entry point to the Wide Beach Development.

The Oval and the intersecting Fox Street and South Street form two roadway loops conducive to expedient traffic routing during the roadway remediation in these areas. Traffic routing is needed for the remediation of the segment of Fox Street between the intersections of South Street and Old Lake Shore Road.

Construction Criteria by the Department of Defense (Reference 9) will be utilized to the extent applicable to develop design for site facilities.

4.3.2 Design Criteria

4.3.2.1 General

- o The site facilities shall be located to permit efficient construction operations required for the remedial actions while minimizing construction cost and disturbance to the resident community. OSHA requirements shall be considered applicable (Section 3.1.2.2 Item a. 6).

- o The site facilities shall include those items which are required for health and safety considerations, and shall be organized to meet the site-specific Health and Safety Plan requirements.

- Site facilities shall be suitable for the project duration of approximately one (1) year.

- Clean and level areas shall be provided for equipment yards, weigh scale, and staging areas for storage of excavated asphaltic material and soil prior to treatment and/or disposal.

- Load bearing characteristics of subsurface materials at the locations of the planned site facilities as well as access roads shall be obtained from the boring data (Section 2.3.1).

- A site drainage and erosion and sediment control system shall be required to provide adequate site drainage and minimize the potential run-off of PCBs from the site during construction (Section 3.1.2.1, Item b.2).

4.3.2.2 Site Offices

- Site offices shall be structurally sound and weather-tight facilities. Office trailers may be used.

- The size of the facilities must be adequate to accommodate the largest number of employees expected at the site simultaneously.

- A separate office shall be provided for exclusive use of the construction management personnel and shall be equipped with all basic features, furniture, and utilities based on Type A Engineer's Office specified in the NYSDOT Standard Specifications (Reference 10).

4.3.2.3 Parking Facilities

- A Parking area shall be designed for easy entrance and exit. A space allowance of 35 square yards per vehicle and a minimum of 30 vehicles shall be considered in the design.

- The parking area shall be constructed of crushed stone or coarse gravel of sufficient thickness over a well compacted subgrade.

4.3.2.4 Access Control and Fencing

- All persons, equipment and vehicles entering and leaving the site shall be controlled. Visitors shall not be permitted to enter active hazardous work areas.

- Security fences where required shall be of chain link design consisting of galvanized steel posts, rails, wire, and gates with a total height of 8 feet.

4.3.2.5 Decontamination Facilities

- o Decontamination facilities for site personnel shall be of adequate size to accommodate the largest number of personnel expected at the site simultaneously. Separate facilities consisting of a contaminated dressing room, shower area and clean dressing area shall be provided for male and female personnel. All wash water shall be collected and discharged to a sump.

- o A decontamination station shall be provided to decontaminate equipment used during excavation of contaminated areas prior to its maintenance, reuse in clean areas, or removal from the site, and shall be positioned so that the wash water will drain to a sump.

- o The sump water shall be treated prior to disposal. The treatment containers shall be decontaminated in accordance with TSCA Requirements (Section 3.1.2.2 Item a.4.).

4.3.2.6 Equipment Yard

- o Equipment yard shall be of adequate size to accommodate the largest number and types of equipment expected to be utilized concurrently at the site.

- o A portion of the equipment yard shall be designated as clean areas for equipment maintenance.

4.3.2.7 Chemical Treatment Plant

- o See Basis of Design Report for Chemical Treatment Plant.

4.3.2.8 Utilities

- o Provisions shall be made for temporary utilities for site offices, decontamination station, and chemical treatment plant including telephone, water supply, electrical power services, and sanitary sewage collection and disposal as applicable.

4.3.2.9 Stockpiling Area

- o Onsite stockpiling of PCB contaminated materials shall comply with TSCA requirements for PCB Storage (Section 3.1.2.2, Item a. 3).

- o Stockpiles of the PCB-contaminated soils shall be provided with a waterproof cover that prevents rainwater infiltration.

- o Clean level areas with adequate drainage shall be provided for soil, gravel, or crushed stone borrow.

4.4 REMOVAL OF ASPHALTIC MATERIALS

4.4.1 Description

Existing asphalt pavement for the roadways, drainage ditches, and driveways will be excavated and removed to permit excavation of the soils below.

The roadways are paved to a thickness of 4 in. in two 2-inch layers while the driveways are paved with a single 2-inch layer.

It was estimated in the On-Scene Coordinator's report (Reference 17) that the area of asphalt pavement included approximately 12,000 sq. yd. of 4-inch pavement and 8,500 sq. yd. of 2-in pavement. The total quantity of asphalt pavement is estimated to be 1810 cu. yd.

The result of asphalt sampling and analysis performed by Ebasco (Section 2.2.3.7) indicate that existing asphalt pavement can be considered uncontaminated and reusable.

4.4.2 Design Criteria

- o The pavement removal shall be sequenced with the soil excavation work to minimize migration of the contaminants, exposure of residents to the contaminated soils, and disturbance to the resident community; and to maximize reuse of asphalt.

- o Clean level areas with adequate drainage shall be provided for stockpiling excavated asphaltic materials separate from stockpiles of contaminated materials.

4.5 EXCAVATION OF CONTAMINATED SOIL

4.5.1 Description

The site areas which require excavation of PCB-contaminated soil include roadways, driveways, drainage ditches, frontyards, backyards, open lots and wetlands.

The depths of excavation necessary to meet the soil removal criterion (to remove all soils containing PCB greater than 10 mg/kg) have been recommended in the ROD as follows (Reference 1):

	Depth (in.)
Roadways	18
Driveways	12
Drainage Ditches	36
Frontyards	6
Backyards	6
Open Lots	6
Wetlands	8

The depth of excavation specified for paved areas are exclusive of the thickness of the pavement.

The supplemental soil sampling conducted by Ebasco (Section 2.2.3) further identified areas of PCB contamination within individual front yards, backyards, open lots, and wetlands. More refined excavation boundaries have been established within these areas.

Exhibit 2 presents the preliminary excavation plan for contaminated soil. Based on available data in the front yards, the general contamination pattern is that most of the PCB-contamination greater than 10 mg/kg is located within a few feet of the edge of the drainage ditch on the side of the road. The preliminary excavation plan includes removal of 18 inches of soil under the roadway, 36 inches of soil in the drainage ditch, and 6 inches of soil in the front yard to 10 feet width on each side of the roadway and drainage ditch. The excavation plan and cross-section is shown in Exhibit 2. It should be noted that the plan also includes excavation of soil in the entire front yards in the southwest corner of the site since the supplemental RI data showed that PCB contaminants exceeded 10 mg/kg in these yards. The surface water drainage pattern at the site is to this area, so there is apparently some degree of PCB transport to this area in the stormwater runoff.

It should also be noted that excavation to depths greater than 6 inches is planned in several areas since samples collected at 6 to 12 inch depths also exceeded 10 mg/kg PCB concentration. These areas are also shown on Exhibit 2.

Based on the preliminary excavation plan the following preliminary excavation quantities have been developed.

	Preliminary Soil Excavation Quantities (Cubic Yards)
Roadways	6,100
Driveways	1,700
Drainage Ditches	10,100
Front Yards	3,600
Backyards	100
Open Lots*	-
Wetlands	200
Total	21,800

* Included in frontyards

It should be noted that the soil excavation quantities in the front yards include excavation of the 10 foot wide section in all the yards, even those for which PCB concentrations were less than 10 mg/kg. If front yards less than 10 mg/kg are excluded from the excavation plan the preliminary soil excavation quantity estimate would be reduced by approximately 600 cubic yards.

There is no need for major dewatering during the excavation of soil at the site since most of the excavation is to be performed above the water table. There are some areas where minor dewatering may be needed when excavating soil in the drainage ditches which represent the deepest cut at 36 inches. Accumulated water in excavated ditches, if any, will be collected for sediment removal, and will be sampled and tested for PCBs prior to its release. The New York guidelines for erosion and sediment control (Reference 11), where applicable, will be followed in developing the design.

4.5.2 Design Criteria

- o The excavation of PCB-contaminated soil from below the pavement will be sequenced with the pavement removal so as to minimize the time of exposure to the contaminated soil that can be transported through airborne dust or surface water runoff, and to minimize interference with community residents activities.

- o The locations and size of significant landscaping items in the yards to be excavated and all utilities above and below grade that can be affected by the excavation will be identified and protected as practicable.

- o Excavated PCB-contaminated materials that are not amenable to chemical treatment (vegetation, tree stumps, rocks, etc.) shall be properly disposed at a licensed RCRA landfill (see Section 3.1.2.2, Items a.2, a.5, and b.1).

  Since PCBs are not listed as hazardous wastes under RCRA, PCB-containing wastes are only subject to the RCRA Land Ban if they are mixed with or otherwise contained in wastes which are considered hazardous under RCRA. Since this is not the case at Wide beach, the RCRA Land Ban will not affect disposal of the material. This is discussed in detail in the preamble to EPA's final rule on land disposal of the so-called "California List" wastes (52 Fed. Reg. 25769-25770, July 8, 1987).

- o Post-excavation soil sampling shall be made to verify that the depths and width of excavation satisfy the soil removal criterion (Section 4.1).

- Accumulated water from runoff in the excavated areas shall be collected for sediment removal, and shall be sampled and tested for PCBs before its release.

4.6 DRAINAGE

4.6.1 Description

The current drainage system at the Wide Beach Development consists of ditches, typically on each side of the roadways, catch basins, and storm drains. The system is largely ineffective due to minimal site relief and damaged storm drains. During the wet season, ponding of water exists for long periods. An improved drainage system will be implemented in conjunction with the design considerations for the site soil excavation, filling, and grading.

Since the soils under the asphalt pavement in roadways and ditches are to be excavated to a depth of 18 in. and 36 in respectively, the site drainage can be improved by re-establishing the finished grade of the roadways lower than the existing. The improved drainage system will incorporate catch basins and interconnecting storm drains and culverts of adequate slope to facilitate flow, and will consider discharge of runoff in the vicinity of the Oval directly to Lake Erie (Reference 12).

4.6.2 Design Criteria

- A master storm drainage plan that integrates individual yard drainage, catch basins, storm drains, and culverts will be developed to provide adequate site drainage.

- The drainage system shall be designed such that interferences with the existing land scaped features or utilities are reduced to a minimum.

- The improved system will be provided with concrete catch basins and manholes at strategic locations to permit monitoring of the transported sediments. This will provide the mechanism to measure the overall effectiveness of the remedial action and also to serve to isolate problem areas.

- The design basis rainfall intensity shall be 1.9 based on a 25-year recurrence storm (Fig. 2-1). The intensity shall be assumed constant over the entire drainage area.

- Rational Formula (Q = CIA) shall be used to calculate the runoff for individual drainage areas, where

  Q = Runoff in cubic feet per second,
  C = Coefficient of runoff,
  I = Rainfall intensity in inches per hour, and
  A = Drainage areas in acres.

- Storm drains and culverts shall be concrete pipe sized and sloped to flow full and to maintain a minimum velocity sufficient to prevent sedimentation.

- The site runoff shall be discharged to Lake Erie to the extent practical. The invert of the storm drain at the point of discharge shall preferably be located above the Lake Erie High Water Level (EL. 579.09 - Reference 13). Compliance to the regulatory requirements governing this work is required (Section 3.1.2.2, Items a.7, a.8, b.3, b.4, and b.5).

4.7 BACKFILLING AND GRADING

4.7.1 Description

Post excavation backfilling and grading will be performed generally to restore the existing site conditions generally and to improve permanent site drainage. The treated soil from the chemical treatment plant will be used for backfill. The backfill materials will be supplemented from other on-site or off-site sources if needed.

4.7.2 Design Criteria

- The excavated areas of the frontyards, backyards and open lots shall be backfilled with treated soil supplemented with soil borrow as necessary, compacted, and graded to a minimum of 2% slope to improve drainage.

- Backfilling, grading and compaction for the roadways and driveways shall be to the lines and grades specified to obtain sound subgrade for asphalt pavements and to improve site drainage.

- The excavated drainage ditches will be backfilled with treated soil supplemented with soil borrow as necessary, compacted, and graded to conform with the improved drainage plan (Section 4.6). Provisions for erosion and sediment control shall be implemented (see Section 3.1.2.1, Item b.2).

- The excavated areas of the wetlands shall be restored to a degree compatible with the surrounding area of wetlands (see Section 3.1.2.1, Items a.1, a.2, and b.1; Section 3.1.2.2, Items a.7 and b.5).

4.8 ASPHALT REPAVEMENT

4.8.1 Description

The excavated roadways and driveways, upon completion of final filling, compaction, and grading, will be repaved with asphalt course(s) conforming to the requirements of the New York State Department of Transportation (NYSDOT) specifications. As the existing asphalt pavement remediation has been constructed in accordance with the NYSDOT specifications (Reference 3) and has been found uncontaminated and reusable (Section 2.2.3.7), it is advantageous to employ the same material and construction requirements of NYSDOT for the new pavement.

4.8.2 Design Criteria

- The roadway and driveway base course shall consist of well graded crushed stone free from deleterious materials compacted to a minimum of 95 percent of the maximum dry density of the materials as determined by a standard proctor test.

- The roadway asphalt pavement shall be designed to support the residential traffic based on the NYSDOT Highway Design Manual (Reference 14).

- The driveway asphalt pavement shall be designed to satisfy the requirements of the Department of the Army and the Air Force Technical Manual - Flexible pavements for roads, streets, walks, and open areas (reference 18).

- Materials and construction requirements for asphalt pavement shall conform to the New York State Department of Transportation (NYSDOT) Standard Specifications (Reference 10). The excavated asphalt pavement materials shall be recycled and reused.

- Geometric design of the roadways shall conform, to the extent practicable, to the NYSDOT Highway Design Manual (Reference 14).

4.9 REVEGETATION

All significant landscaping features excavated from the yards shall be replaced either by replanting the original or, if dammaged, by a substantially equivalent plant. Restoration shall include addition of topsoil where necessary, seeding, fertilizing and planting as needed to provide soil stabilization and to restore the area to existing conditions.

5.0 TECHNICAL BID DOCUMENTS

5.1 GENERAL

Technical bid documents shall include technical specifications, drawings, schedules, and cost estimates to be used by the USACOE for bidding for construction contracts. The technical bid documents shall be prepared and submitted for the EPA/USACOE review in accordance with the following schedule (Reference 4):

- o Preliminary Bid Package (35% completion)
- o Intermediate Bid Package (65% completion)
- o Pre-Final Bid Package (95% completion)
- o Final Bid Package (100% completion)

5.2 TECHNICAL SPECIFICATIONS

Technical specifications necessary for the implementation of the selected remedies shall be developed as an integral part of the technical bid package. The technical specifications will include, as applicable, the following items:

- o Scope of Work
- o Applicable Codes and Standards
- o Material Specifications
- o Technical Requirements

The USACOE Guide Specifications (Reference 15), where applicable, shall be utilized as the baseline in developing the technical specifications for the project. These Guide Specifications, which are designed for adaptation to projects of varying types and locations shall be modified as necessary to meet the specific project requirements. The specifications shall be prepared in accordance with the Construction specifications Institute (CSI) format.

The scope of technical specifications for site work is as follows:

1. Site Preparation
   - o Survey
   - o Clearing and Grubbing
   - o Support Facilities (see Note below)
   - o Fencing
   - o Roads
   - o Erosion and Sediment Control

2. Excavation
   - o Asphalt Pavement
   - o PCB Contaminated Soil

3. Filling and Grading

4. Drainage

5. Asphalt Pavement

6. Revegetation

7. Construction Materials
   - o Bituminous Materials
   - o Aggregates
   - o Concrete
   - o Reinforcing Steel
   - o Crushed Stone

8. Offsite Transportation and Disposal

9. Health and Safety Guidelines

NOTE: Support facilities will include trailer complex, prefab metal building, decontamination facilities, parking facilities, sanitary facilities, and utilities.

5.3 DRAWINGS

Drawings to be developed by Ebasco to support bidding for construction contracts shall provide existing site conditions, remedial design requirements, suggested construction approach, layouts, typical sections and details.

Detailed construction drawings necessary for the implementation of the selected remedy shall be developed by the general contractor (GC) based on the Technical Bid Package prepared by Ebasco. A preliminary list of drawings to be developed by Ebasco is presented in Table 5-1.

5.4 CONSTRUCTION SCHEDULE AND COST ESTIMATES

5.4.1 Construction Schedule

Upon completion of the drawings and technical specifications Ebasco will prepare a project schedule for the design and construction phases of the project. Each activity will be defined relative to its prerequisite and corequisite activities and the durations for each activity will then be estimated.

The general sequence of remediation activities outlined in Section 4.2 shall form the basis for scheduling.

TABLE 5-1

PRELIMINARY LIST OF SITE WORK DRAWINGS

Drawings

Description	Estimated No. of Drawings
Site General Arrangement	1
Site Exploration Plan	1
Site Facilities Preparation	
- Plans	1
- Sections & Details	1
Asphalt Paving Removal	
- Plans	1
- Sections & Details	1
Site Soil Excavation	
- Plans	4
- Sections & Details	1
Storm Drainage System Removal	
- Plans, Sections & Details	2
Site Drainage System	
- Plans	1
- Sections & Details	1
Site Backfill, Grading & Repaving	
- Plans	3
- Sections & Details	1

5.4.2 <u>Construction Cost Estimates</u>

Ebasco will utilize the Technical Bid Package to provide the EPA with the design and construction cost estimates. The cost estimates will be based on estimated quantities of materials, estimated equipment and manpower requirements, conceptual layouts and general construction approach.

The cost estimates shall be prepared in conformance with the USACOE requirements (Reference 16).

6.0 SITE SPECIFIC HEALTH & SAFETY CONSIDERATIONS

The Site Specific Health and Safety Plan shall include but not be limited to the following:

- Applicable Regulations/Publications
- Submittals
- Health and Safety Personnel
- General Requirements
- Levels of Protection
- Safe Work Practices/Engineering Safeguards
- Training
- Medical Surveillance
- Different Work Zone Categories
- Personnel Safety Equipment/Protective Clothing
- Personnel/Equipment Decontamination Facilities
- Personal Hygiene
- Emergency Equipment/First Aid Requirements
- Emergency Response/Contingency Planning
- Posted Regulation
- Communications
- Environmental and Personal Monitoring
- Accident Prevention Plan
- Air Monitoring
- Recordkeeping and Reporting
- Residents Evacuation Plan

7.0 REFERENCES

1) Record of Decision, Wide Beach Development Site, USEPA, Region II, September 30, 1985.

2) Remedial Investigation Report for Wide Beach Development Site, Town of Brant, Erie County, New York, by EA Engineering, Science and Technology, August 1985.

3) Engineering Feasibility Study for Remedial Action at Wide Beach Development Site, Brant, New York, By EA Engineering, Science, and Technology, August, 1985.

4) Work Plan For Remedial Design, Wide Beach Site, Wide Beach, Town of Brant, Erie County, New York, By Ebasco Services Incorporated, April 1988.

5) Sanitary Sewer Plans for Erie County Sewer District No.2 Erie County, New York, Lotus Bay Sewer District of the Town of Brant, By Edwards and Moonreiff, P.C. Engineers and Surveyors, Springville, New York.

6) Draft Field Operations Plan, Remedial design, Wide Beach Site, Wide Beach, Town of Brant, Erie County, New York, By Ebasco Services Incorporated, September 1986.

7) Draft Perched Water Treatability Study Results, Wide Beach Site, Wide Beach, Town of Brant, Erie County, New York, By Ebasco Services Incorporated, March 1988.

8) Field Data From Wide Beach Development Site Survey, Wendel Survey, February 1987.

9) Construction Criteria, Department of Defense DOD 4270.1M, December 15, 1983.

10) Standard Specficiations - Construction and Materials, New York State Department of Transportation, Office of Engineering, January 2, 1985.

11) New York Guidelines For Urban Erosion and Sediment Control, Urban Soil Erosion and Sediment Control Committee, March 1988.

12) Letter dated July 21, 1987 from Herbert H King of the Unites states Environmental Protection Agency (EPA) to Thomas Granger of Ebasco Services Incorporated in regard to Wide Beach Development Site, upgrading surface water drainage.

13) Water Data Report, NY-84-3, USGS 1984.

14) Highway Design Manual, New York State Department of Transportation, Facilities Design Division.

15) USACOE Pamphlet No. EP 310-1-5, Index of Guide Specfications, March 1985.

16) Preparation of Construction Cost Estimates for Hazardous Waste Cleanup Projects, Department of the Army, Corps of Engineers, Issue No. 1, January 1985.

17) On-Scene Coordinator's Report, Wide Beach PCB Contamination, Town of Brant, Erie County, New York, June 1986.

18) Flexible Pavements for Roads, Streets, Walks, and Storage Areas, Technical Manual TM 5-822-5, AFM 88-7, Chap. 3, Department of the Army and the Air Force, May 1980.

APPENDIX A

GEOTECHNICAL SOIL BORING LOGS

7450b

SUMMARY LOG OF BORING

PROJECT Wilde Beach
ELEVATION ______
GW DEPTH (FT) ~7ft
TOTAL DEPTH 7ft
DATE START 12/13/86
DATE COMPLETE 12/13/86
FIELD ENGINEER I. Ritthoser
BORING NO. EN-01
SHEET 1 OF 1
DRILLER Kimball
DATE/HOUR/AM-PM 12/13/86, 1510

DEPTH FEET (A)	BLOWS PER SIX INCHES (B)	SAMPLE NO. (C)	PERCENT RECOVERY (D)	GEOLOGY (E)	UNIFIED SOIL CLASSIFICATION	MATERIAL CLASSIFICATION (F)	LOWER EXPLOSIVE LIMIT (%) (G)	PHOTO IONIZATION DETECTOR HNU (PPM) (H)	ORGANIC VAPOR ANALIZER (PPM) (I)	ORGANIC VAPOR ANALIZER (PPM) (J)	LABORATORY SAMPLE NO. (K)	L	M	N	O	REMARKS (P)
1	1 2					Brown and Orange silty Clay with trace gravel										Simco 4000 Drill Rig
2	4 11		33													
3																
4																
5	15 15	EN-01-02				Top 2" wet brown silty Clay										
6	20 15		25			bottom 4". Dk grey fractured shale										
7						Water table ~ 7ft Terminate boring due to Bedrock										

BORING TERMINATE AT ______ FT

EBASCO BORING NO.

SUMMARY LOG OF BORING

PROJECT Vide Beach
ELEVATION
TOTAL DEPTH 5.5 Ft
DATE START 12/13/86
GW DEPTH (FT) not Encountered
DATE COMPLETE 12/13/86
FIELD ENGINEER T. M. Hoover
BORING NO. EN-02
DRILLER Kimball
SHEET 1 OF 1
DATE/HOUR/AM-PM 12/13/86, 14:37

DEPTH FEET	BLOWS PER SIX INCHES	SAMPLE NO.	PERCENT RECOVERY	GEOLOGY	UNIFIED SOIL CLASSIFICATION	MATERIAL CLASSIFICATION	LOWER EXPLOSIVE LIMIT (%)	PHOTO IONIZATION DETECTOR HNU (PPM)	ORGANIC VAPOR ANALIZER (PPM)	ORGANIC VAPOR ANALIZER (PPM) (SAMPLE)	LABORATORY SAMPLE NO.	RESULTS (PPM)				REMARKS
A	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P
	1	EN-02-2				4" Dk brown silt w/some clay, moist										Simco 4000 Drill
1	1					8" orange-brown silty clay										Rig
	6															
2	7		50													
3						-3.5 Ft ⇒ Hit gray weathered shale										
4	16					grey green weathered shale										
5	55/6		30													
6						Terminate boring due to B.drock										
7																
8																

BORING TERMINATE AT ______ FT

EBASCO BORING NO.

SUMMARY LOG OF BORING

PROJECT W i c Meach
ELEVATION ______ GW DEPTH (FT) NE
TOTAL DEPTH 7 ft
DATE START 12/13/86 DATE COMPLETE 12/13/86

BORING NO. EN-03 SHEET 1 OF 1
DRILLER Kimball
FIELD ENGINEER T. Mittower
DATE/HOUR/AM-PM 12/13/86, 17:20

DEPTH FEET (A)	BLOWS PER SIX INCHES (B)	SAMPLE NO. (C)	PERCENT RECOVERY (D)	GEOLOGY (E)	UNIFIED SOIL CLASSIFICATION	MATERIAL CLASSIFICATION (F)	LOWER EXPLOSIVE LIMIT (%) (G)	PHOTO IONIZATION DETECTOR HNU (PPM) (H)	ORGANIC VAPOR ANALIZER (PPM) (I)	ORGANIC VAPOR ANALIZER (PPM) (J)	LABORATORY SAMPLE NO. (K)	L	M	N	O	REMARKS (P)
1	1 2	EN-03-02	50			Top 3" DK brown moist silt w/some clay										Simco 4000 Drill Rig
2	3 8					Bottom 8" Orange and brown silty clay										
3																
4						— Shale encountered at (4.5')										
5	55/6		100			5.0-5.5 → Grey green weathered shale										
6																
7						Terminate sampling at 5.5 ft due to Bedrock/refusal										

BORING TERMINATE AT ______ FT

EBASCO BORING NO.

SUMMARY LOG OF BORING

PROJECT Wide Beach
BORING NO. EN-04 SHEET 1 OF 1
ELEVATION ____ GW DEPTH (FT) not encountered
DRILLER Kimball
TOTAL DEPTH 5.5 ft
DATE START 12/13/86 DATE COMPLETE 12/13/86 FIELD ENGINEER T. M. Howes DATE/ HOUR/ AM-PM 12/13/86, 12:5[illegible]

DEPTH FEET (A)	BLOWS PER SIX INCHES (B)	SAMPLE NO. (C)	PERCENT RECOVERY (D)	GEOLOGY (E)	UNIFIED SOIL CLASSIFICATION	MATERIAL CLASSIFICATION (F)	LOWER EXPLOSIVE LIMIT (%) (G)	PHOTO IONIZATION DETECTOR HNU (PPM) (H)	ORGANIC VAPOR ANALIZER (PPM) (I)	ORGANIC VAPOR ANALIZER (PPM) (J)	LABORATORY SAMPLE NO. (K)	L	M	N	O	REMARKS (P)
1		EN-04-02	33			moist DK brown silty ~~sand~~ clay w/trace course sand grading to orange-brown mottled silty clay										Simco 2000 Drill Rig
2																
3																
4						4.8' - Encountered bedrock										
5	55		100			grey green weathered shale										
6						Terminate spoon at 5.5' due to refusal										
7																

Column groups: DESCRIPTION (E–F); FIELD INSTRUMENTATION: BOREHOLE (G–I), SAMPLE (J); LABORATORY TESTS: RESULTS (PPM) (L–O).

BORING TERMINATE AT ______ FT

EBASCO BORING NO.

SUMMARY LOG OF BORING

PROJECT: W.le Beach
ELEVATION:
GW DEPTH (FT):
TOTAL DEPTH: 5.5 Ft
DATE START: 12/13/86
DATE COMPLETE: 12/13/86
BORING NO.: EN-05
SHEET 1 of 1
DRILLER: Kimball
FIELD ENGINEER: T. Mithower
DATE/ HOUR/ AM-PM: 12/13/86, 13:25

DEPTH FEET (A)	BLOWS PER SIX INCHES (B)	SAMPLE NO. (C)	PERCENT RECOVERY (D)	GEOLOGY (E)	UNIFIED SOIL CLASSIFICATION	DESCRIPTION — MATERIAL CLASSIFICATION (F)	FIELD INSTRUMENTATION — BOREHOLE — LOWER EXPLOSIVE LIMIT(%) (G)	BOREHOLE — PHOTO IONIZATION DETECTOR HNu (PPM) (H)	BOREHOLE — ORGANIC VAPOR ANALIZER(PPM) (I)	SAMPLE — ORGANIC VAPOR ANALIZER(PPM) (J)	LABORATORY SAMPLE NO. (K)	LABORATORY TESTS — RESULTS(PPM) (L)	(M)	(N)	(O)	REMARKS (P)
1	1					0.5'-2.5' → 2" brown silty clay, wet, rich										Simco 4000
	1					orange and grey clay w/ [illegible]										Drill Rig
2	5		75													
	10															
3																
4		EN-5-2														
5	50/[illegible]		[illegible]			5.0-5.5 → grey green weathered shale										
6						Terminate sampling at 5.5' due to										
7						spoon refusal and bedrock										

BORING TERMINATE AT ______ FT

EBASCO BORING NO.

SUMMARY LOG OF BORING

PROJECT Wide Beach
ELEVATION ______ GW DEPTH (FT) ______
TOTAL DEPTH 6Ft
DATE START 12/13/86 DATE COMPLETE 12/13/86

BORING NO. EN-06 SHEET 1 of 1
DRILLER Kimball
FIELD ENGINEER T. Mittower
DATE/HOUR/AM-PM 12/13/86, 13:45

DEPTH FEET (A)	BLOWS PER SIX INCHES (B)	SAMPLE NO. (C)	PERCENT RECOVERY (D)	GEOLOGY (E)	UNIFIED SOIL CLASSIFICATION	MATERIAL CLASSIFICATION (F)	LOWER EXPLOSIVE LIMIT (%) (G)	PHOTO IONIZATION DETECTOR HNU (PPM) (H)	ORGANIC VAPOR ANALIZER (PPM) (I)	ORGANIC VAPOR ANALIZER (PPM) – SAMPLE (J)	LABORATORY SAMPLE NO. (K)	L	M	N	O	REMARKS (P)
1–2	1, 1, 4, 5		33			0.5'–2.5' → Top 3" – dark brown silt and clay with trace roots; Bottom 5" – brown and orange silty clay										Simco 4000 Drill Rig
3																
4																
5–6	26, 65/6	EN-06-2	100			5.0'–6.0' → Top 4" brown silt w/some clay; Bottom 2" grey weathered shale										
7						Terminate boring at 6' due to refusal of spoon and Bedrock										

BORING TERMINATE AT ______ FT

EBASCO BORING NO.

SUMMARY LOG OF BORING

PROJECT Wide Beach
BORING NO. EN-07
SHEET 1 OF 1
ELEVATION ______
GW DEPTH (FT) Not Encountered
DRILLER Kimball
TOTAL DEPTH 5.5 Ft
DATE START 12/13/86
DATE COMPLETE 12/13/86
FIELD ENGINEER T. M. Hower
DATE/HOUR/AM-PM 12/13/86

DEPTH FEET	BLOWS PER SIX INCHES	SAMPLE NO.	PERCENT RECOVERY	GEOLOGY	UNIFIED SOIL CLASSIFICATION	DESCRIPTION: MATERIAL CLASSIFICATION	FIELD INSTRUMENTATION – BOREHOLE: LOWER EXPLOSIVE LIMIT (%)	BOREHOLE: PHOTO IONIZATION DETECTOR HNU (PPM)	BOREHOLE: ORGANIC VAPOR ANALIZER (PPM)	SAMPLE: ORGANIC VAPOR ANALIZER (PPM)	LABORATORY SAMPLE NO.	LABORATORY TESTS RESULTS (PPM)				REMARKS
A	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P
1	1 3					0.5-2.5 → 3" of Dark brown clay w/some silt, followed by brown and orange mottled silty Clay										Simco 4000 Drill Rig
2	5 5		33													
3																
4		EN-07-2														
5	70		100			5.0-5.5 → 1" Dark brown siltyclay followed by greygreen weathered shale										
6						Terminate boring at 5.5ft due to refusal and Bedrock										

BORING TERMINATE AT ______ FT

EBASCO BORING NO.

SUMMARY LOG OF BORING

PROJECT Wide Beach
ELEVATION ______ GW DEPTH (FT) ______
TOTAL DEPTH 10ft
DATE START 12/13/86 DATE COMPLETE 12/13/86

BORING NO. EN-08 SHEET 1 OF 1
DRILLER Kimball
FIELD ENGINEER T.M. Hoover
DATE/HOUR/AM-PM 11:05, 12/13/86

DEPTH FEET (A)	BLOWS PER SIX INCHES (B)	SAMPLE NO. (C)	PERCENT RECOVERY (D)	GEOLOGY (E)	UNIFIED SOIL CLASSIFICATION	MATERIAL CLASSIFICATION (F)	LOWER EXPLOSIVE LIMIT(%) (G)	PHOTO IONIZATION DETECTOR HNU (PPM) (H)	ORGANIC VAPOR ANALIZER (PPM) (I)	ORGANIC VAPOR ANALIZER (PPM) (J)	LABORATORY SAMPLE NO. (K)	L	M	N	O	REMARKS (P)
1	2, 5, 7, 10	EN-08-2				.5-2.5' → brown Silty Clay										Simco 4000 Drill Rig
2																
3																
4																
5	50		100			5'-6' → 4" Darkbrown silty Clay w/trace of orange silty clay followed by weathered Shale.										
6																
7																
8																
9																
10						Augered through weathered Bedrock to 10ft.										

Field instrumentation: Borehole (G, H, I); Sample (J). Laboratory tests: Results (PPM) (L, M, N, O).

BORING TERMINATE AT ______ FT

EBASCO BORING NO.

SUMMARY LOG OF BORING

PROJECT: Wide Beach
ELEVATION: ______ GW DEPTH (FT): ______
TOTAL DEPTH: ______
DATE START: 12/1/86 DATE COMPLETE: 12/1/86

BORING NO.: EN-9 SHEET 1 OF
DRILLER: Kimball
FIELD ENGINEER: P. Conde
DATE/HOUR/AM-PM: 12/1/86, 12:24

DEPTH FEET (A)	BLOWS PER SIX INCHES (B)	SAMPLE NO. (C)	PERCENT RECOVERY (D)	GEOLOGY (E)	UNIFIED SOIL CLASSIFICATION	MATERIAL CLASSIFICATION (F)	LOWER EXPLOSIVE LIMIT (%) (G)	PHOTO IONIZATION DETECTOR HNU (PPM) (H)	ORGANIC VAPOR ANALIZER (PPM) (I)	ORGANIC VAPOR ANALIZER (PPM) (J)	LABORATORY SAMPLE NO. (K)	L	M	N	O	REMARKS (P)
0–2	1, 3, 3		50			0-2 - Soil: LT Brown fine silty sand Followed by Grey and Brown mottled clay, Trace silt, Wet, Loose										Started 12:00 Drilling; SS #1 - 12:15 no recovery 2 attempts made; SS #2 - 12:45
3																
4																
5–7	6, 9, 12, 13	EN 9-02	100			5-7' - Same as above. Trace gravel Wet.										SS #3 - 12:55
8																
9																
10–12	9, 30, 30, 34		100			10-11 ft - Same as above - weathered shale encountered at 11 ft. Terminate boring due to bedrock										13:00 → Terminate Boring
13																
14																
15																

BORING TERMINATE AT ______ FT

EBASCO BORING NO. ______

SUMMARY LOG OF BORING

PROJECT: W.le Beach
BORING NO.: EN-10
SHEET 1 OF
ELEVATION:
GW DEPTH (FT): 3½ ft
DRILLER: Kimball Associates
TOTAL DEPTH:
DATE START: 12/1/86
DATE COMPLETE: 12/1/86
FIELD ENGINEER: P. Conde
DATE/HOUR/AM-PM: 12/1/86, 11:30

DEPTH FEET (A)	BLOWS PER SIX INCHES (B)	SAMPLE NO. (C)	PERCENT RECOVERY (D)	GEOLOGY (E)	UNIFIED SOIL CLASSIFICATION	MATERIAL CLASSIFICATION (F)	LOWER EXPLOSIVE LIMIT (%) (G)	PHOTO IONIZATION DETECTOR HNu (PPM) (H)	ORGANIC VAPOR ANALIZER (PPM) (I)	ORGANIC VAPOR ANALIZER (PPM) (J)	LABORATORY SAMPLE NO. (K)	L	M	N	O	REMARKS (P)
0–2	1, 3, 3, 2	EN-10 2	50			0-2ft → Brown Clayey Silt, l.ttle gravel Trace Fine Sand, ~~wet~~ moist. Loose										Simco 4000 Drill Rig. S.S.#1 -11:35
3–4						4ft → encountered a brown clay, l.ttle Fine sand. moist - Auger Cuttings										3¼" I.D. Augers
5–7	1, 1, 2, 4		80			5-7ft – Grey and Brown mottled Clay. Trace silt, Trace gravel. wet. Loose										SS#2 11:45
10–12	12, 30, 35, 41		75			10-11 ft → Same as above then turning to weathered grey shale Fragments										SS#3-12:00
12–15						Augered down to 15ft → alternating layers of Hard and decomposed grey shale. Fractures in shale introduced a lot of ~~cuttings~~ water in hole										12:18 = Terminate boring at 15ft due to Bedrock.

BORING TERMINATE AT ~~EN-~~ 15ft FT

Water at 3½ ft upon termination of Drilling

EBASCO BORING NO. EN-10

APPENDIX B

HYDROGEOLOGY OF SEWER TRENCH

8450b

APPENDIX B

Hydrogeology of Sewer Trench

Recharge to the sewer trench occurs via the bedrock in two areas. The first area is located between wells SW-5 and SW-4. The second area is located in the vicinity of well SW-3. The sewer trench lies directly in fractured shale. Groundwater in the fractured shale is essentially confined with an upward gradient into the pea gravel of the sewer trench.

Once the sewer trench is filled with water, flow into the trench ceases to be in an upward direction and the system is at equilibrium. At this point, flow assumes a horizontal direction and would conform to the site specific flow direction.

As shown in Figure B-1, surface recharge to the sewer trench occurs along South Street where the sewer trench is located directly under the drainage ditch. This is most likely the primary cause of the perched water in the sewer trench east of well SW-4. Based on hydraulic gradients in this area, groundwater flow direction in this area would flow towards well SW-4.

As shown in Table B-1, hydraulic conductivities within the sewer trench range from 5.7 (10^{-4}) to 4.7 (10^{-3}) cm/sec based on slug tests performed on wells SW-3 and SW-4 respectively. Slug tests were also performed on bedrock wells MW-6 and OW-3 with hydraulic conductivity ranging from 8.1 (10^{-6}) cm/sec to 3.4 (10^{-4}) cm/sec respectively.

A maximum gradient in the trench of 0.002 was calculated from water level data in wells SW-6 and SW-4. Assuming a porosity of 0.30 within the pea gravel and hydraulic conductivity measurements within the trench, a groundwater velocity of between 30 to 300 ft/year could be calculated. Slug tests performed in the bedrock aquifer indicate flow velocities on the order of approximately 1 foot/year although flow through fractures in the bedrock would conceivably yield much greater flow velocities in the order of feet per day. It is difficult to determine groundwater flow velocities transverse to where the trench is cut into the bedrock, although the fact that the trench was filled with water during construction, indicates high flow rates in this area.

The hydraulic conductivities were determined by the Bouwer-Rice Method where:

$$K = \frac{r_c^2 \, (\ln r_e/r_w) \quad (\ln y_o/y_1)}{2 \; L_e \quad t}$$

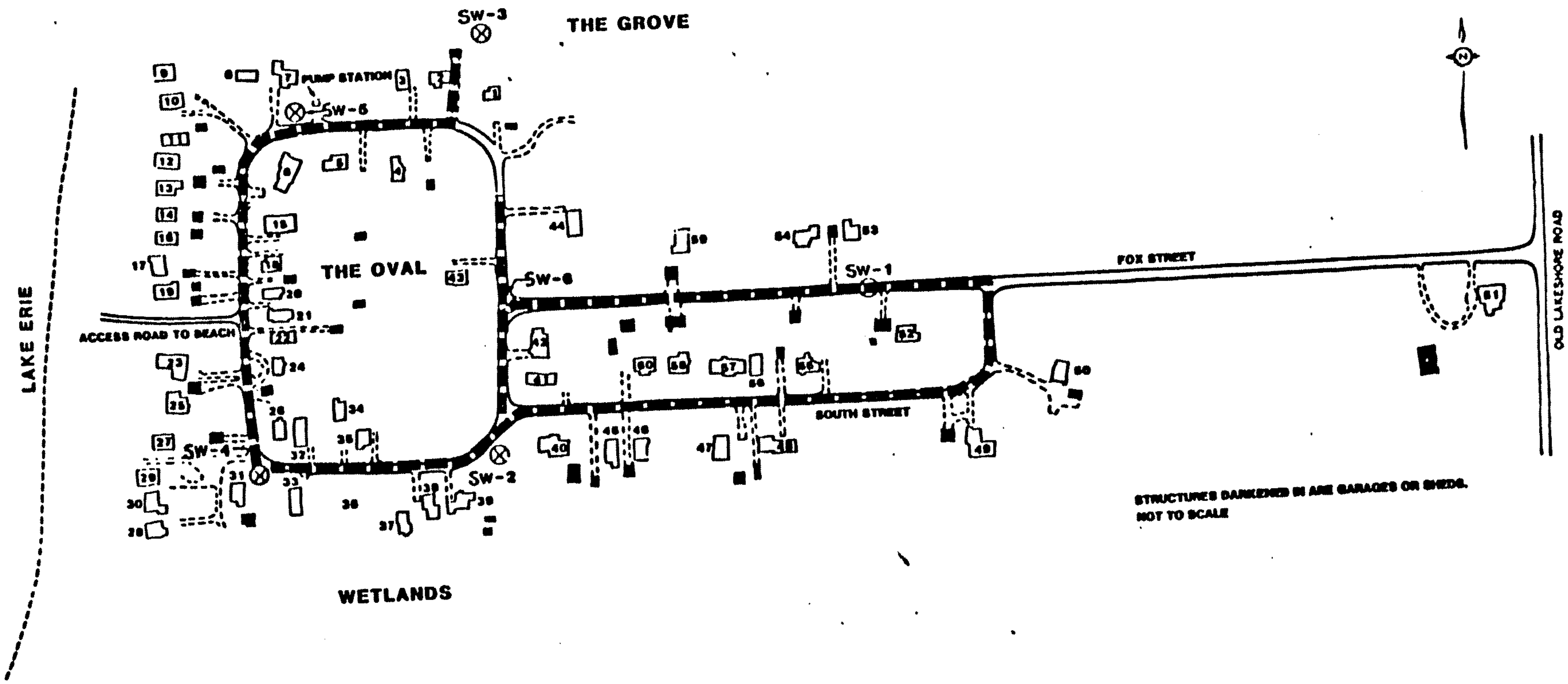
and where: r_c is radius of the well casing
r_e is effective radius of the well
r_w is radius to the sand pack or trench
y_o is displacement at time, t = 0
y_t is point of displacement
L_e is length of well screen
t is time of displacement

$$\ln {}^{re}/rw = \frac{1}{\frac{1.1}{\ln L_w/r_w} + \frac{C}{L_e/r_w}}$$

and where: L_w is length of static water column
C is a dimensional parameter relating to L_e/r_w

The data is shown in Table B-2, Slug Test Data.

(Bouwer, H., and R. C. Rice, 1976, A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells. Water Resour. Res. 12: 423-428)



SOURCE: EA ENGINEERING
REMEDIAL INVESTIGATION REPORT
AUGUST 1985

FIGURE B–1

LOCATION OF SEWER TRENCH WELLS

TABLE B-1

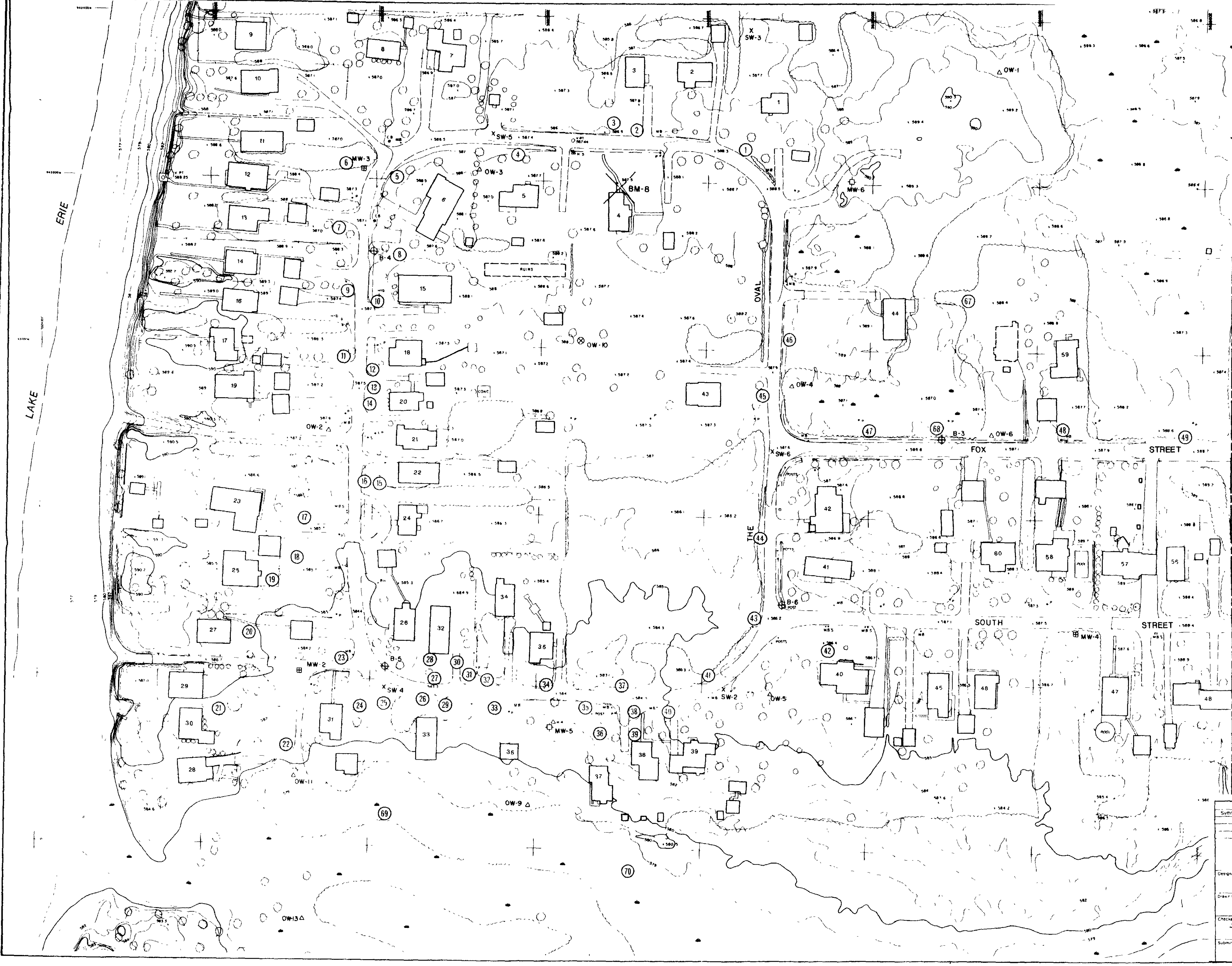
SLUG TEST RESULTS

Well No.	Hydraulic Conductivity - K
MW-6	3.4 (10^{-4}) cm/sec
OW-3	8.1 (10^{-6}) cm/sec
SW-3	5.7 (10^{-4}) cm/sec
SW-4	4.7 (10^{-3}) cm/sec

TABLE B-2

SLUG TEST DATA

WELL NO.	L_w ft	r_w ft	C	L_e ft	$\ln {}^{r_e}/_{r_w}$	Y_o ft	Y_t ft	t sec	K cm/sec
MW-6	20	0.3	2.5	15	3.20	0.45	0.01	300	3.4 (10^{-4})
OW-3	21.25	0.3	2.5	15	3.24	4.94	4.9	60	8.1 (10^{-6})
SW-3	2.58	0.09	2.5	2.5	2.50	0.07	0.01	420	5.7 (10^{-4})
SW-4	6.38	0.10	1.95	2.5	2.92	0.14	0.02	60	4.7 (10^{-3})



LEGEND

(15) SOIL SAMPLE LOCATIONS (PCB LEVEL > 10 mg/kg)

⊞ 2 in Stainless Steel Well (MW)

2 in Stainless Steel Well with Soil Sampling for Analysis (MW)

⊗ 4 in PVC Well (OW)

△ 2 in PVC Well (OW)

⊕ Test Boring (B)

X Sewer Well (SW 2, 4, 5, and 8 are buried in curb boxes marked water)

BM No 8 N E Corner of Conc Stoop on N Side of House Sta 35+55, 55 Rt Elev 588 99

SAMPLE LOCATION NO.	EBASCO SAMPLE I.D.	PCB CONCENTRATION (mg/kg) 0-6 IN.	6-12 IN.
1.	WB-SF-01-03	51.2	18.3
2.	WB-SF-03-01	37.9	
3.	WB-SF-03-02	19 7	11 3
	WB-SO-01-C	13.7	58.6
4.	WB-SF-05-02	43 9	
5.	WB-SF-06-02	11 8	
6.	WB-SF-11-02	26 5	
7.	WB-SF-13-01	74.6	
8.	WB-SF-15-06	11.9	
9	WB-SF-16-01	396 0	228 0
[illegible]	WB-SF-15-01	14.9	
	WB-SF-17-02	16.3	
[illegible]	WB-SF-18-01	13.6	
[illegible]	WB-SF-20-04	10.7	
[illegible]	WB-SF-20-02	20.5	
[illegible]	WB-SF-22-03	26 7	
[illegible]	WB-SF-22-01	16.0	
[illegible]	WB-SF-23-04	32 0	
[illegible]	WB-SF-25-05	56 6	
[illegible]	WB-SF-25-06	10.6	
[illegible]	WB-SF-27-05	11.3	
[illegible]	WB-SF-30-05	13 3	
[illegible]	WB-SF-28-01	21 6	
[illegible]	WB-SF-27-02	12.6	
[illegible]	WB-SF-31-05	59.3	13.3
[illegible]	WB-SF-31-06	196.8	
[illegible]	WB-SF-33-01	283.0	12 4
27	WB-SF-32-03	113.0	12.1
28	WB-SF-32-02	149 0	36 2
29	WB-SF-33-02	77.2	30.6
[illegible]	WB-SF-32-04	39.7	
31	WB-SF-32-05	38.0	
32	WB-SF-34-02	10.1	
33	WB-SF-33-03	82.0	175.1
	WB-SF-36 01	721 0	11.4
	WB-SF-36-02	15 7	
	WB-SF-36-03	288.0	23.1
	WB-SF-36-06	193.0	
34	WB-SF-35-03	11.6	
35	WB-SF-37-01	21.3	12 4
36.	WB-SF-37-03	14 0	
37	WB-VL-01-01	19.4	
38	WB-SF-38-01	194 1	12 3
39.	WB-SF-38-04	11 3	
40.	WB-SF-38-03	71.2	
41	WB-VL-02-01	53.8	
42	WB-SF-40-03	31 9	
43	WB-VL-03-01	42 9	
44	WB-VL-04-01	15 5	
45	WB-SF-43-01	66 0	33 0
46.	WB-SF-44-01	6 6	
47	WB-VL-05-02	991.0	
	WB-VL-05-03	232.4	
	WB-VL-05-01	222.0	
48.	WB-SF-59-02	66.3	
	WB-SF-59-07	154.0	
49	WB-VL-07-01	20.8	

NOTES:

1) WORK THIS DRAWING WITH SH 2 OF EXHIBIT 1

2) PHOTOGRAMMETRY BY LOCKWOOD SUPPORT SERVICES, ROCHESTER, N.Y

Revisions			
Symbol	Descriptions	Date	Approved

EBASCO SERVICES INCORPORATED

U S ARMY ENGINEER DISTRICT CORPS OF ENGINEERS KANSAS CITY, MISSOURI

WIDE BEACH SITE

SOIL SAMPLE LOCATIONS (PCB LEVEL > 10 mg/kg)

Designed by:

Drawn by: AZN

Checked by: DS

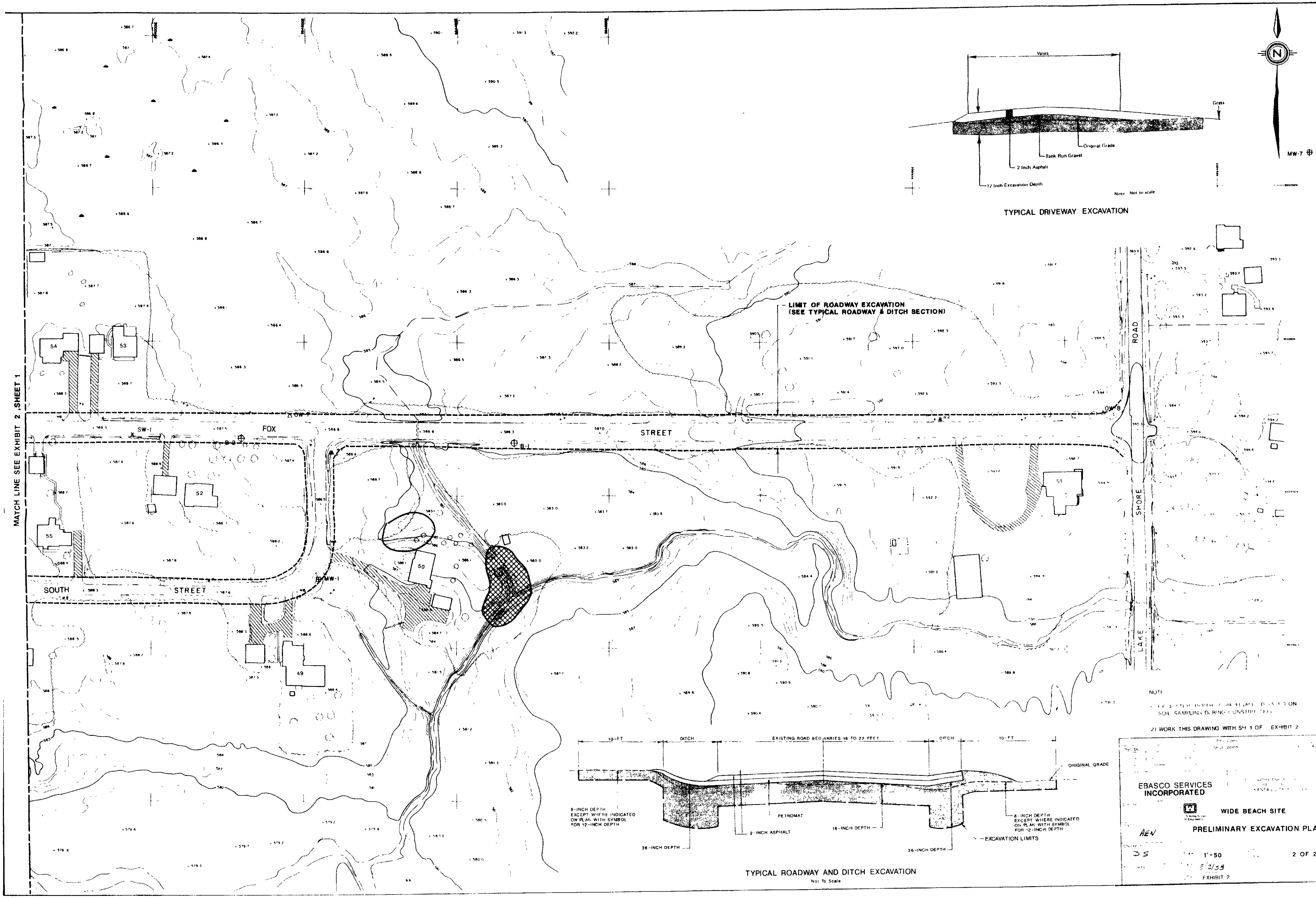
Submitted by:

Scale: 1" = 50'

Date: 5/2/88

Sheet number: 1 OF 2

Dwg: EXHIBIT 1



NOTE

2) WORK THIS DRAWING WITH SH 1 OF EXHIBIT 2

EBASCO SERVICES INCORPORATED

WIDE BEACH SITE

PRELIMINARY EXCAVATION PLAN

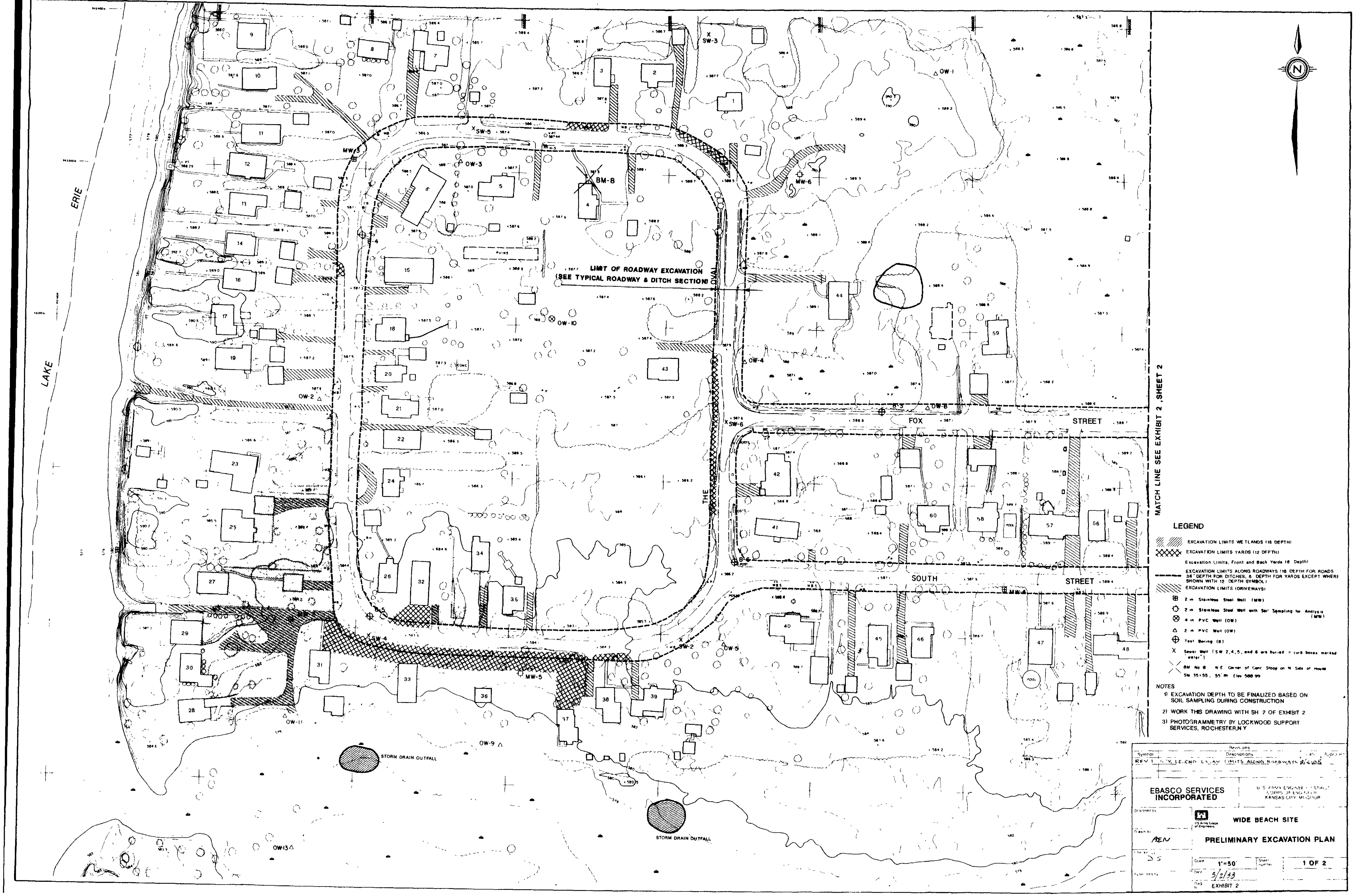
AEN

DS

1"=50

2 OF 2

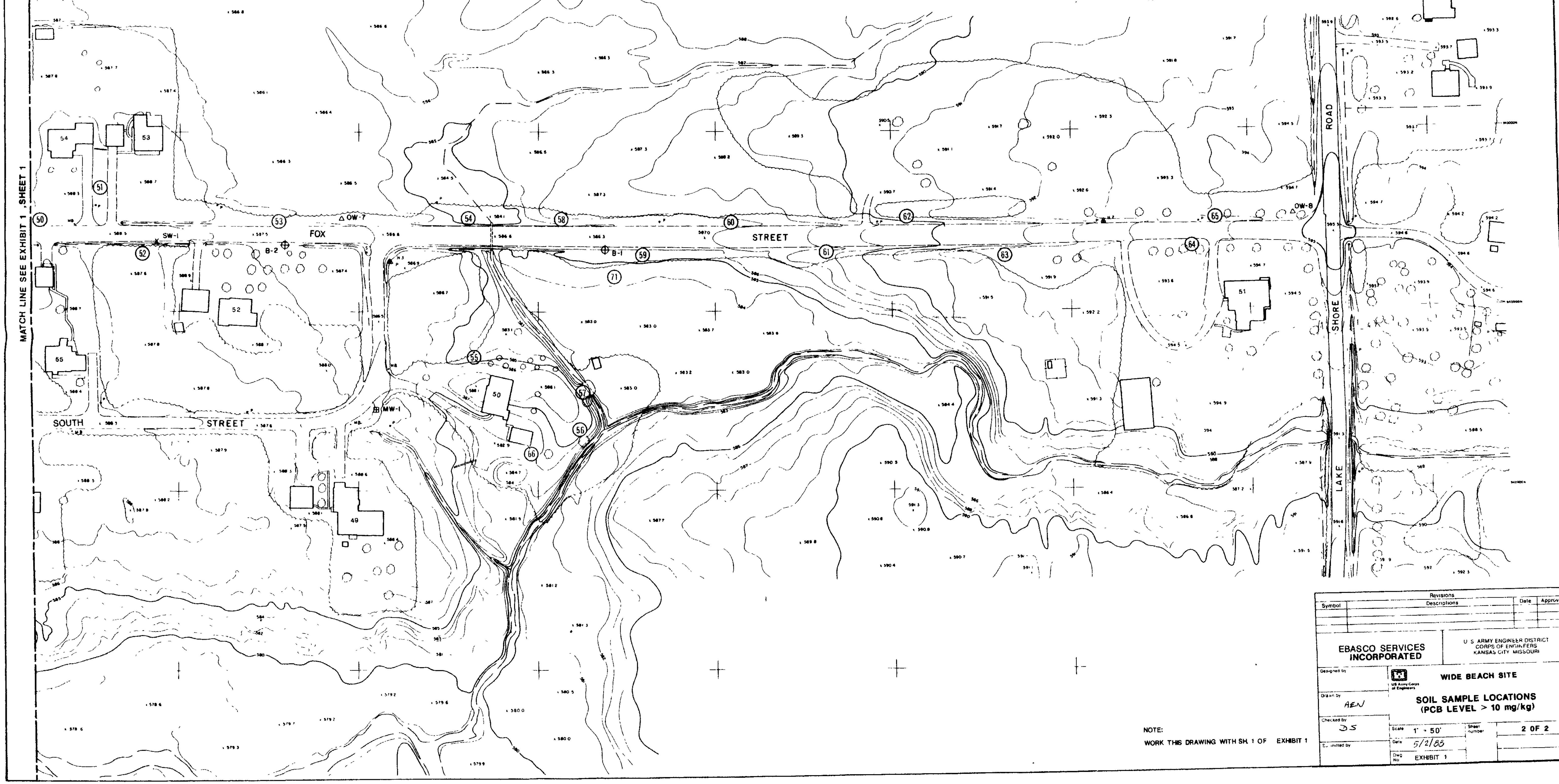
EXHIBIT 2


LAKE ERIE
THE OVAL
FOX STREET
SOUTH STREET
LIMIT OF ROADWAY EXCAVATION
(SEE TYPICAL ROADWAY & DITCH SECTION)
MATCH LINE SEE EXHIBIT 2, SHEET 2
STORM DRAIN OUTFALL
STORM DRAIN OUTFALL
LEGEND
EXCAVATION LIMITS WETLANDS (18 DEPTH)
EXCAVATION LIMITS YARDS (12 DEPTH)
Excavation Limits, Front and Back Yards (6 Depth)
EXCAVATION LIMITS ALONG ROADWAYS (18 DEPTH FOR ROADS 36" DEPTH FOR DITCHES, 6 DEPTH FOR YARDS EXCEPT WHERE SHOWN WITH 12 DEPTH SYMBOL)
EXCAVATION LIMITS (DRIVEWAYS)
2 in Stainless Steel Well (MW)
2 in Stainless Steel Well with Soil Sampling for Analysis (MW)
4 in PVC Well (OW)
2 in PVC Well (OW)
Test Boring (B)
NOTES
1) EXCAVATION DEPTH TO BE FINALIZED BASED ON SOIL SAMPLING DURING CONSTRUCTION
2) WORK THIS DRAWING WITH SH 2 OF EXHIBIT 2
3) PHOTOGRAMMETRY BY LOCKWOOD SUPPORT SERVICES, ROCHESTER,N.Y
EBASCO SERVICES INCORPORATED
WIDE BEACH SITE
PRELIMINARY EXCAVATION PLAN
1"=50'
1 OF 2
EXHIBIT 2

SAMPLE LOCATION NO.	EBASCO SAMPLE I.D.	PCB CONCENTRATION (mg/kg) 0-6 IN.	6-12 IN.
50.	WB-SF-34-02	23.2	
51.	WB-SF-44-03	11.7	
52.	WB-VL-12-02	25.4	
	WB-VL-12-01	16.3	
53.	WB-VL-08-02	54.0	
	WB-VL-08-01	29.4	
54.	WB-VL-09-01	33.9	
	WB-VL-09-02	16.7	
55.	WB-SF-50-02	16.2	
~~56.~~	~~WB-SB-50-02~~	14.4	
57.	WB-SB-50-01	17.0	10.7
58.	WB-VL-15-01	187.0	
59.	WB-VL-16-01	162.0	
	WB-VL-16-02	15.2	
60.	WB-VL-17-01	371.0	
61.	WB-VL-18-01	13.5	
62.	WB-VL-19-01	147.0	
63.	WB-VL-20-02	89.5	
	WB-VL-20-01	12.5	
64	WB-SB-51-01	25.7	
65.	WB-VL-21-01	154.0	
	WB-VL-21-02	126.0	
66.	WB-SB-50-05	19.2	28.2
67.	WB-SB-44-01	39.2	
68.	WB-VL-06-01	102.0	
	WB-VL-06-02	10.7	
69.	WB-SW-01	11.0 (at 0-8 IN.)	
	WB-SW-02	26.5 (at 0-8 IN.)	
	WB-SW-03	24.5 (at 0-8 IN.)	
70.	WB-SW-04	26.7 (at 0-8 IN.)	
	WB-SW-04	12.7 (at 8-16 IN.)	
71.	WB-EN-07	122.0 (at 0-6 IN.)	

LEGEND

- (15) SOIL SAMPLE LOCATIONS (PCB LEVEL > 10 mg/kg
- ⊞ 2-in Stainless Steel Well (MW)
- ⌖ 2-in Stainless Steel Well with Soil Sampling for Analysis (MW)
- ⊗ 4 in PVC Well (OW)
- △ 2-in PVC Well (OW)
- ⊕ Test Boring (B)
- X Sewer Well (SW 2,4,5, and 6 are buried in curb boxes marked "water")
- ╳ BM No 8 N E Corner of Conc Stoop on N Side of House Sta 35+55, 55' Rt Elev 588 99



NOTE:
WORK THIS DRAWING WITH SH. 1 OF EXHIBIT 1

Symbol	Revisions Descriptions	Date	Approved

EBASCO SERVICES INCORPORATED

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI

US Army Corps of Engineers

WIDE BEACH SITE

SOIL SAMPLE LOCATIONS
(PCB LEVEL > 10 mg/kg)

Designed by
Drawn by AEN
Checked by DS
Submitted by
Scale 1" = 50'
Date 5/2/85
Dwg No EXHIBIT 1
Sheet number 2 OF 2