Con Edison
Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, N.Y. 10003

February 17, 1993

BY CERTIFIED MAIL

Mr. Michael J. O'Toole, Jr., P.E.
Director, Division of Hazardous
Waste Remediation
New York State Department of
Environmental Conservation
50 Wolf Road - Room 212
Albany, New York 12233-7010

Subject: Consolidated Edison - Echo Avenue Site
Site # 3-60-016
Order on Consent Index # W3-0531-91-02

Dear Mr. O'Toole:

Pursuant to Article XXVI of the subject Order on Consent ("Order"), we are herewith submitting to you six (6) copies of our report on the Phase II Investigation conducted at the Echo Avenue Site in 1992 in accordance with the Order. On the basis of our recent discussion with Mr. Louis Oliva of the NYSDEC's Division of Environmental Enforcement, we are submitting the report's Appendices (Volumes II through VI of the report), which contain references, various field logs, Quality Assurance Report, laboratory analytical data sheets, Validation Report, etc., in one copy only. The Phase II Investigation was performed and the report was prepared by Lawler, Matusky & Skelly Engineers of Pearl River, New York, our consultant for this project.

The Phase II Investigation indicated either non-detectable or low concentration levels of PCBs in all media sampled. However, one soil sample (collected from a small pile of dirt) contained 12 mg/kg PCBs, a sediment sample collected from electrical manhole MH-3 contained 12.7 mg/kg PCBs, and wipe samples collected in two areas of the concrete floor of vacant halls (inside the retired substation building) indicated PCBs ranging between 32 ug/100 cm^2 and 39 ug/100 cm^2. Pursuant to Article XV of the Order, Con Edison proposes to undertake interim remedial measures ("IRMs") to clean all these PCB-contaminated areas. Accordingly, we are also submitting to you six copies of a Work Plan for these IRMs for review and approval by NYSDEC.

tal of the Hazardous Ranking System
Score to NYSDEC with the report on
Plan.

son to supply NYSDEC, within 30 days of
on Edison's possession or control regarding
and other information related to the Site, to
been provided to NYSDEC. After our initial
ata and information required in Article II had
ough we had previously provided NYSDEC with
of the PCB-Contaminated electrical equipment
iscovered that we had not provided NYSDEC with
nalytical results for all oil-filled equipment that was
e, we are supplying these data sheets herein.

edient review of the Work Plan for the proposed IRMs
te these IRMs as soon as possible. Please contact me if
the documents that are being transmitted to you with this

Very truly yours,

Robert T. Keegan, Ph. D.
Director
Water and Waste Management
Environmental Affairs

P. Oliva, Esq. (NYSDEC Division of Environmental Enforcement)
Hari Agrawal (NYSDEC - Region 3)

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
New York, New York

PHASE II INVESTIGATION AT ECHO AVENUE SITE

Volume I - Report

February 1993

LMS-93/0104&115/155

LAWLER, MATUSKY & SKELLY ENGINEERS
Environmental Science & Engineering Consultants
One Blue Hill Plaza
Pearl River, New York 10965

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CHAPTER 1

EXECUTIVE SUMMARY

The Echo Avenue site is located in the City of New Rochelle on Echo Avenue, in Westchester County, New York (Figure 1-1). The property is owned by Consolidated Edison Company of New York, Inc. (Con Edison). Figure 1-2 shows the pertinent physical features of the site, the Phase II monitoring well locations, and the location and orientation of photographs taken during this investigation. Photographs 1-6 follow Figure 1-2. The site is bordered by Echo Bay to the north, Sentinel Fuel Oil Company (currently Shoreline Oil Company) to the northwest, Echo Avenue to the west, and commercial and residential properties to the south and east. The site is approximately 2.35 acres in size. Tidal fluctuations in Echo Bay, which is part of Long Island Sound, vary up to 10 ft.

The site was originally owned by Westchester Lighting Company and was sold in the 1930s to Con Edison, which used it as an electrical distribution substation until it was retired in 1981. From 1985 to 1987, Con Edison voluntarily sampled and cleaned the site of residual polychlorinated biphenyl (PCB) contamination. Because the site is adjacent to residential areas, the areas remediated were cleaned up in compliance with nonrestricted access area PCB cleanup levels as stipulated in the U.S. Environmental Protection Agency (EPA) spill cleanup policy (i.e., 10 mg/kg in soils, gravel, and other similar substances, and 10 $\mu g/100\ cm^2$ on solid surfaces). The New York State Department of Environmental Conservation (NYSDEC) placed the site on its Registry of Inactive Hazardous Waste Disposal Sites in January 1988 and classified the site as 2A, a temporary classification assigned to sites that have inadequate and/or insufficient data to otherwise classify the site. Con Edison then submitted a report documenting the sampling and cleanup undertaken by them and requested that the site be delisted. NYSDEC required that additional sampling be conducted. Subsequently, Con Edison entered into a Consent Order with NYSDEC in June 1992 that included a Phase II investigation of the site.

The work plan for the 1992 investigation required the completion of the following tasks: drilling of soil borings; installation of one additional monitoring well; sampling of the

NEW YORK

QUADRANGLE LOCATION

SITE COORDINATES

Latitude: 40°54' 42.3" N

Longitude: 73°46' 27.1" W

0 2000 ft

SCALE

1 in. = 2000 ft

Map source:

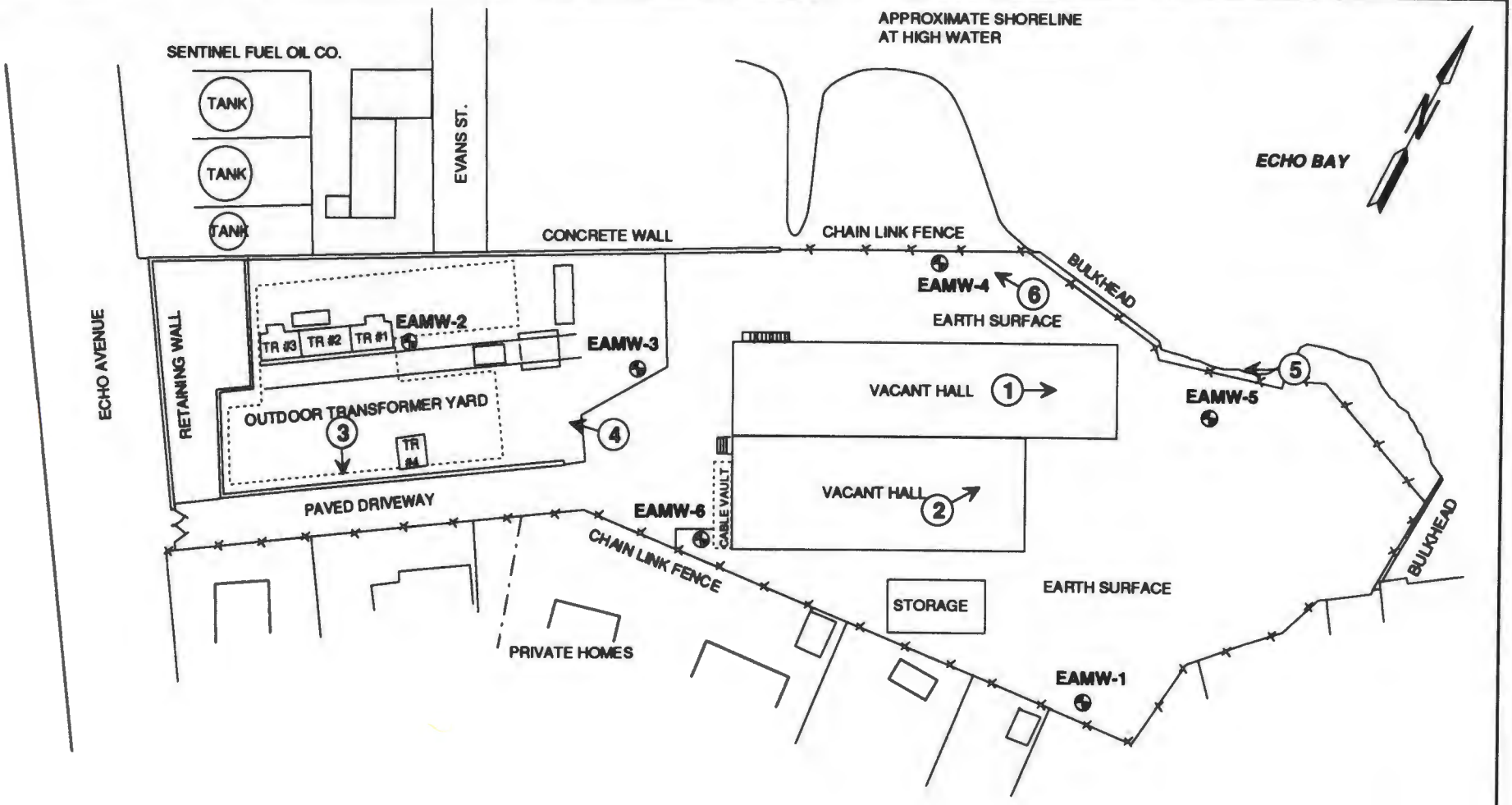
USGS 7.5 min quadrangle map, Mount Vernon, NY, 1966, photorevised 1979.

FIGURE 1-1

SITE LOCATION

ECHO AVENUE SITE
NYSDEC No. 360016
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



LEGEND

- Monitoring well
- 1 Photo location and orientation

0 80 160 ft

SCALE
1 in. = 80 ft

FIGURE 1-2

SITE SKETCH AND PHOTO ORIENTATION

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

PHOTO 1. Looking at east end of north vacant hall.

PHOTO 2. Looking at north and east walls of south vacant hall.

PHOTO 3. Looking south at outdoor transformer yard.

PHOTO 4. Looking west at out door transformer yard; double manhole MH-3 is in foreground.

PHOTO 5. Drainage pipe No. 3; Echo Bay is to right.

PHOTO 6. Existing monitoring well MW-4.

groundwater, shallow soil, Echo Bay, drainage pipes, and manhole MH-3 sediments; concrete coring and sampling throughout the outdoor transformer yard; wipe sampling of various rooms in the substation building; and report preparation.

The results of the investigation indicated that the site is clean, with the vast majority of the site meeting the EPA cleanup levels of 10 mg/kg for soils and 10 $\mu g/100\ cm^2$ for structures. All areas are clean except for the presence of low levels (<1 mg/kg) of PCBs in the sediments in Echo Bay, in the drainage pipes, in the concrete in the outdoor transformer yard area, in several soil areas on the property, and in isolated areas within the building. One soil sample contained over 10 mg/kg of PCBs and several scattered areas of the floor of the vacant halls within the substation building showed PCB concentrations over 10 $\mu g/100\ cm^2$. The PCB concentrations in the manhole on the site were also in excess of 10 mg/kg. The bay water had low levels of VOCs and no PCBs. Soils on the site also had low levels of polycyclic aromatic hydrocarbons (PAHs), phthalate acid esters (PAEs), naphthalene, and some heavy metals, including mercury, lead, arsenic, cadmium, chromium, and zinc. The PAH, naphthalene, and lead contamination is most likely associated with fuel products.

Five monitoring wells had been previously installed on site; one new well was installed as part of this Phase II investigation. Each of these six wells and the bay water were sampled twice. The second round of analyses were conducted using methodologies to determine whether low levels of PCBs and volatile organic compounds (VOCs) existed. No PCBs or PAHs were detected in any of the wells on the site. One VOC, toluene, was detected during the first round at an estimated concentration which was below the groundwater standard. The metals results showed concentrations of arsenic, beryllium, cadmium, chromium, iron, manganese, magnesium, sodium, and zinc in excess of groundwater standards. Although the metals are in excess of the groundwater standards, the saline content of the water precludes its use as drinking water. The metal contamination in the groundwater appears to be associated with particulate matter as opposed to being dissolved. The high magnesium and sodium concentrations appear to be the result of saline water intrusion from the bay; a tidal influence was observed in all wells, with the greatest effect seen in the two wells near Echo Bay. Groundwater flows generally from south to north (toward Echo Bay).

Based on the findings of the Phase II investigation, the following recommendations are made for the site:

- Delineate the area of shallow soil contamination where over 10 mg/kg of PCBs were found. Excavate contaminated soil to a depth of 10 in., conduct post-cleanup monitoring, and backfill with clean fill.
- Dewater the manhole and remove and dispose of the sediments in MH-3; fill the manhole with concrete.
- Double pressure wash scattered areas on the floor in the vacant halls showing moderate concentrations of PCBs. Verify the cleanup with wipe sampling.
- Fill in and restore the area where the storage shed was located to the east of the office/storage building.
- Fill in and restore the area southeast of the office/storage building.

CHAPTER 2

OBJECTIVES

Lawler, Matusky & Skelly Engineers (LMS), under contract to Consolidated Edison Company of New York, Inc. (Con Edison), conducted a Phase II investigation of the Echo Avenue site, located in the City of New Rochelle, Westchester County, New York. Con Edison had signed an Order on Consent with the New York State Department of Environmental Conservation (NYSDEC) to implement a Phase II investigation of the site. The investigation was targeted to gather data and enable NYSDEC to further evaluate the site and make a determination as to whether the site constitutes a significant threat to the public health or environment that may necessitate remedial work. Con Edison was required by the Order on Consent to submit a work plan providing a detailed description of the proposed Phase II investigation. LMS prepared the work plan, which was accepted and approved by NYSDEC in June 1992. The rationale for the sampling program developed in the work plan was to sample areas that were not sampled previously and conduct additional sampling at other selected areas of the site. These areas to be sampled included:

- Wipe samples from inside the substation building
- Surface and subsurface soil samples from around the site
- Sediment samples from Echo Bay and from drainage pipes that discharge to the bay
- Core and/or chip samples from concrete in the outdoor transformer yard
- Sediment and water samples from an on-site manhole
- Drilling of an additional groundwater monitoring well and collection of two rounds of samples from each of the wells on the site
- Collection of a water sample from Echo Bay

After completion of the sampling programming a report describing the results was to be prepared that included:

- A geological and hydrogeological site assessment, including determination of the depth to groundwater and aquifers of concern
- An identification and evaluation of the presence, concentration, and nature and extent of contamination
- A determination of the significance of any release and the degree to which it may threaten surrounding areas
- Any recommendations for possible future investigation or remediation on site

The Phase II investigation conducted for the Echo Avenue site is discussed in detail in Chapters 3 and 4 and documentation appears in the following appendices:

A - Reference Documentation
B - Site Inspection/Air Monitoring Data
C - Health and Safety Plan
D - Boring/Well Logs
E - Well Development Data
F - Sampling Logs
G - Analytical Data Summary Sheets
H - QA/QC Report
I - Applicable Records

CHAPTER 3

DESCRIPTION OF PHASE II INVESTIGATION

3.1 LITERATURE REVIEW

LMS completed an extensive literature review of the Echo Avenue site prior to submittal of the work plan. This included a review of the "Report on Consolidated Edison Company's Echo Avenue Site, New Rochelle, New York," submitted to NYSDEC in February 1988. The sampling results and cleanup procedures documented in this report are summarized in section 4.1, Site History.

3.2 SITE RECONNAISSANCE

A site reconnaissance was conducted prior to preparation of the work plan. The purpose of the reconnaissance was to:

- Monitor the air at the site to determine the level of personnel protection required during future activities.
- Locate potential sites for soil samples.
- Locate a potential site for one new monitoring well.
- Locate potential sites for concrete core samples.
- Locate potential sites for sediment samples.
- Locate potential sites for wipe samples.
- Determine any obstacles to drilling.
- Determine the structural integrity of the substation building.

Air monitoring at the site was conducted using an HNu photoionization detector (PID). Measurements were taken at upwind and downwind locations in the breathing zone, 4 to 6 ft above the ground. Information collected during the air monitoring is found in Appendix B. Also presented in Appendix B are additional photographs not included in Chapter 1.

Based on the information gathered during the site reconnaissance, LMS prepared a site-specific health and safety plan (HASP) that was followed by all personnel during activities on the site. A copy of the HASP is included as Appendix C.

3.3 GROUNDWATER INVESTIGATION

An investigation was implemented to determine whether any contaminants had entered local groundwater from the Con Edison site. The study included the installation of a new monitoring well (EAMW-6) followed by sampling of the groundwater from the new well and the five existing wells. Before work on the site commenced, Con Edison was informed of the proposed drilling location so that underground utility lines could be marked. Locations of monitoring wells EAMW-1 through -6 are shown on Figure 3-1.

3.3.1 Water Elevation Measurements

Water elevations in the wells were measured to define the groundwater table in order to determine the depth and movement of groundwater and its influence on contaminant mitigation.

Groundwater elevations in coastal areas are commonly influenced by fluctuating tidal cycles of nearby water bodies. LMS believed that tidal fluctuations might influence groundwater elevations at the Echo Avenue site. To determine the degree of tidal influence of the bay on on-site groundwater, levels in MW-1 through MW-5 were measured for 24 hrs to determine the depth for placement of the well screen of EAMW-6. Water levels were simultaneously monitored with Stevens meters that continuously plotted water elevations.

The results of the tidal monitoring showed that tidal influences were present but that the effects were very localized. Significant fluctuations in groundwater elevation were observed in EAMW-4 and EAMW-5. These two wells are located very close to Echo Bay (30-40 ft). Groundwater elevation in EAMW-4 varied 6.2 ft from low to high tide and in EAMW-5 the tidal range was 4.5 ft. Wells EAMW-1, -2, and -3, positioned further inland, were only slightly influenced by tidal changes in Echo Bay (Table 3-1 and Figures 3-2 to 3-5).

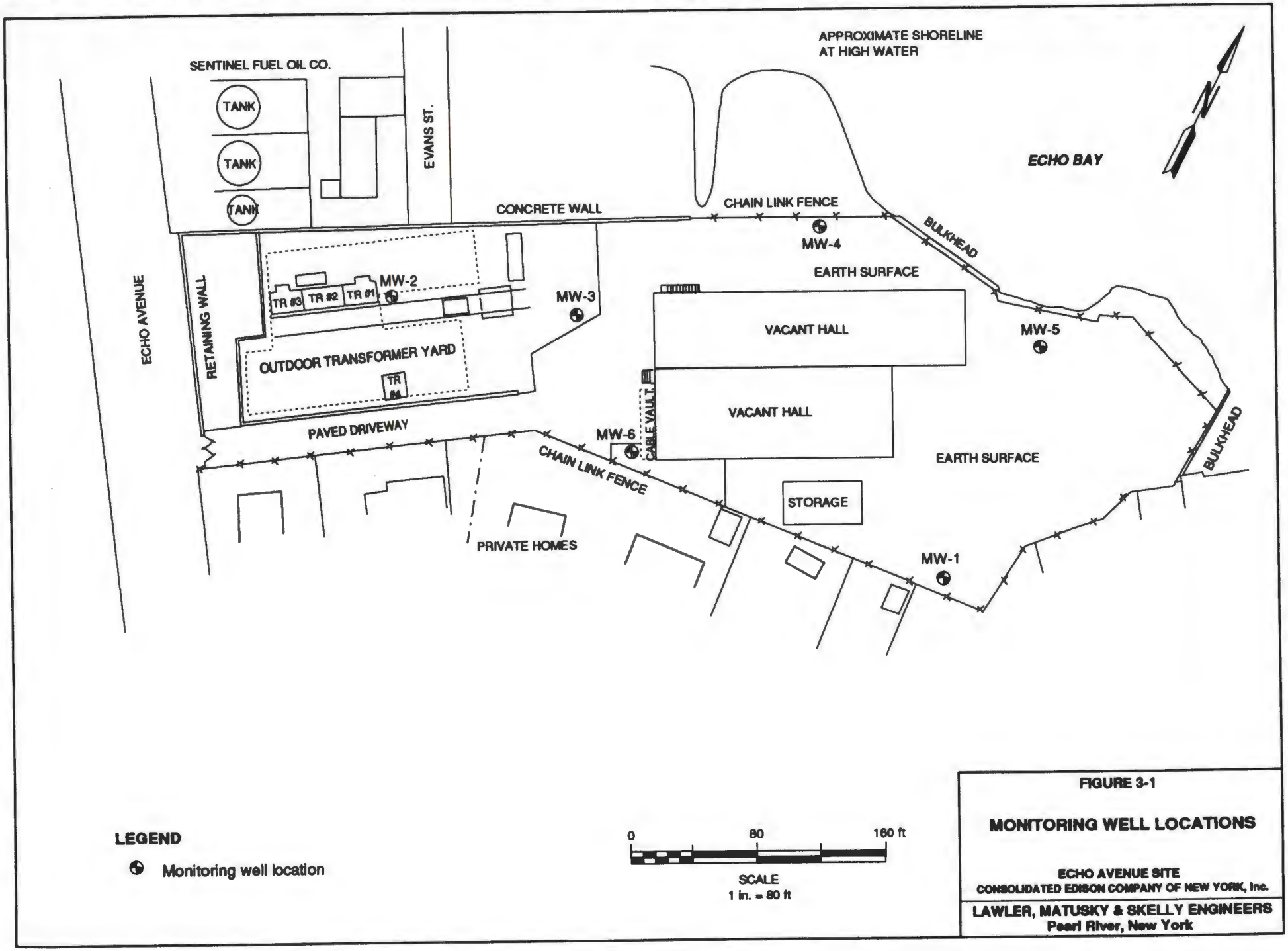


FIGURE 3-1

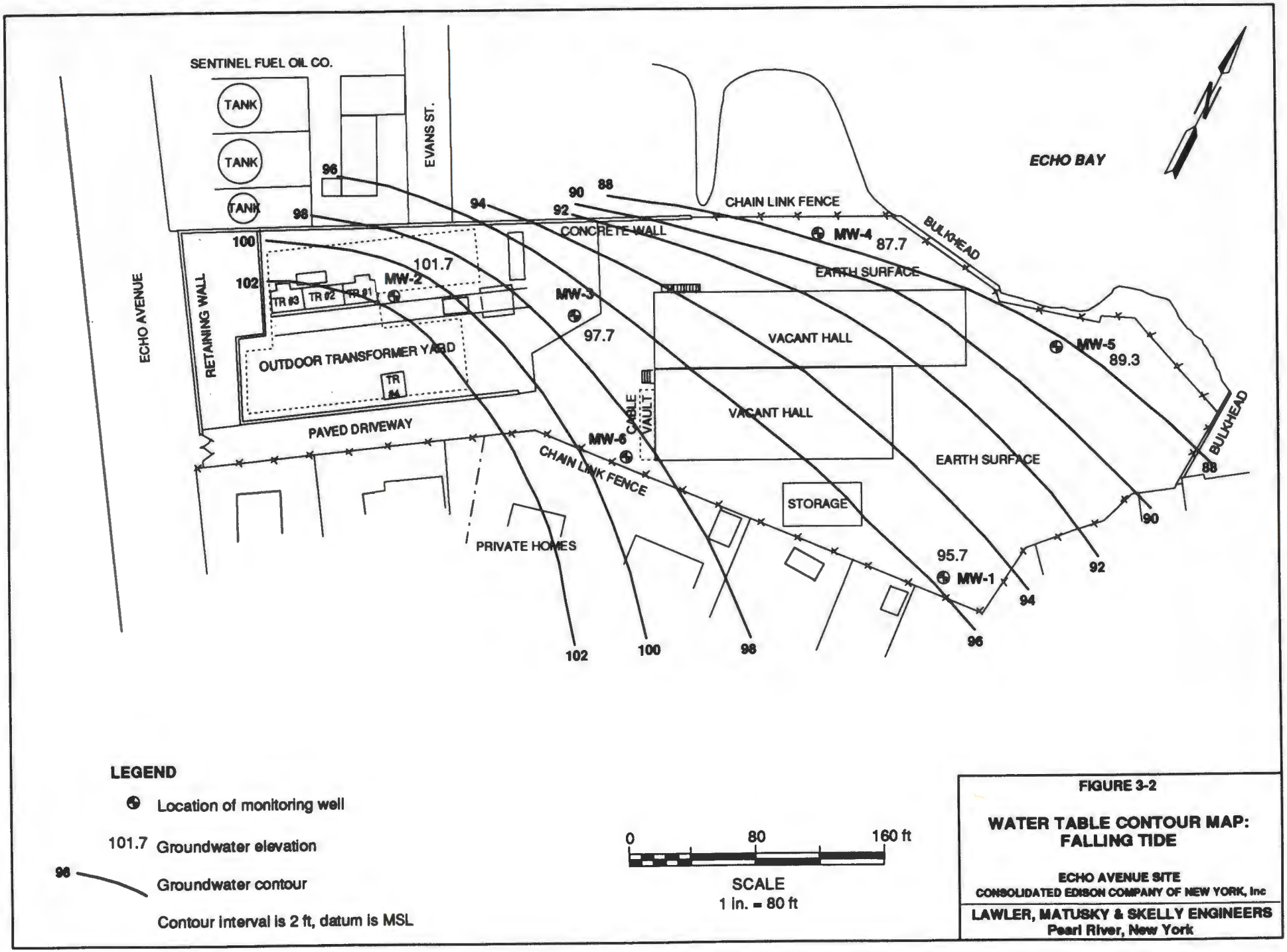
MONITORING WELL LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 3-1
INFLUENCE OF ECHO BAY TIDAL CYCLE ON WATER ELEVATIONS
wells monitored for 24 continuous hours

WELL	DATE July 1992	GROUNDWATER ELEVATION FLUCTUATIONS (ft)					
		HIGH	LOW	HIGH	LOW	MEDIAN	RANGE
EAMW-1	16 to 17	95.7	95.65	95.6	95.45	95.6	0.25
EAMW-2	16 to 17	102.05	102.26	102.29	102.3	102.23	0.25
EAMW-3	15 to 16	97.65	97.58	97.59	97.59	97.6	0.07
EAMW-4	14 to 15	93.77	87.82	93.89	87.68	90.79	6.21
EAMW-5	14 to 15	93.4	89.33	93.7	89.25	91.42	4.45



LEGEND

- Location of monitoring well
- 101.7 Groundwater elevation
- 96 Groundwater contour
- Contour interval is 2 ft, datum is MSL

0 80 160 ft

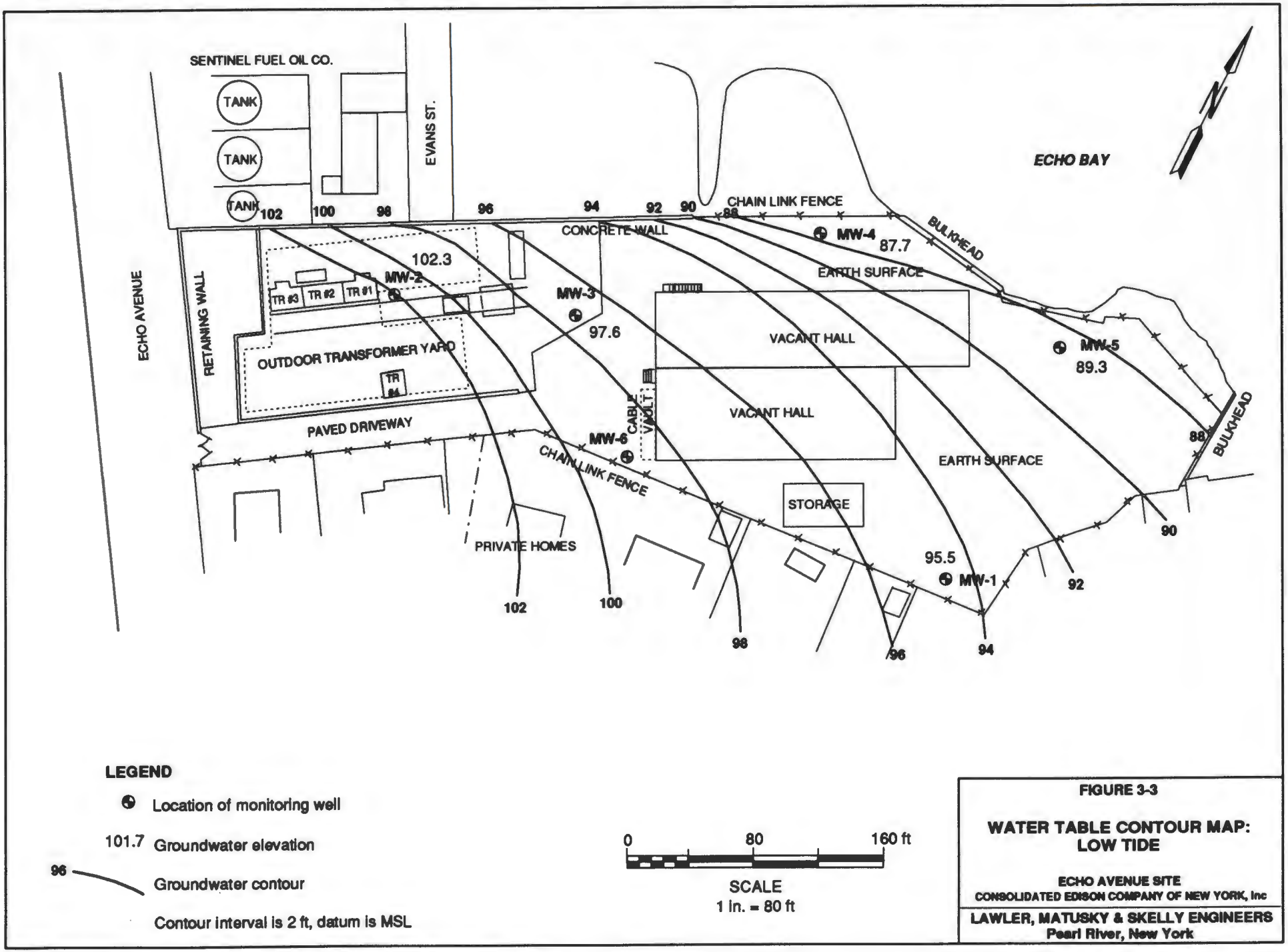
SCALE
1 in. = 80 ft

FIGURE 3-2

WATER TABLE CONTOUR MAP: FALLING TIDE

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



LEGEND

- Location of monitoring well
- 101.7 Groundwater elevation
- 96 Groundwater contour
- Contour interval is 2 ft, datum is MSL

0 80 160 ft

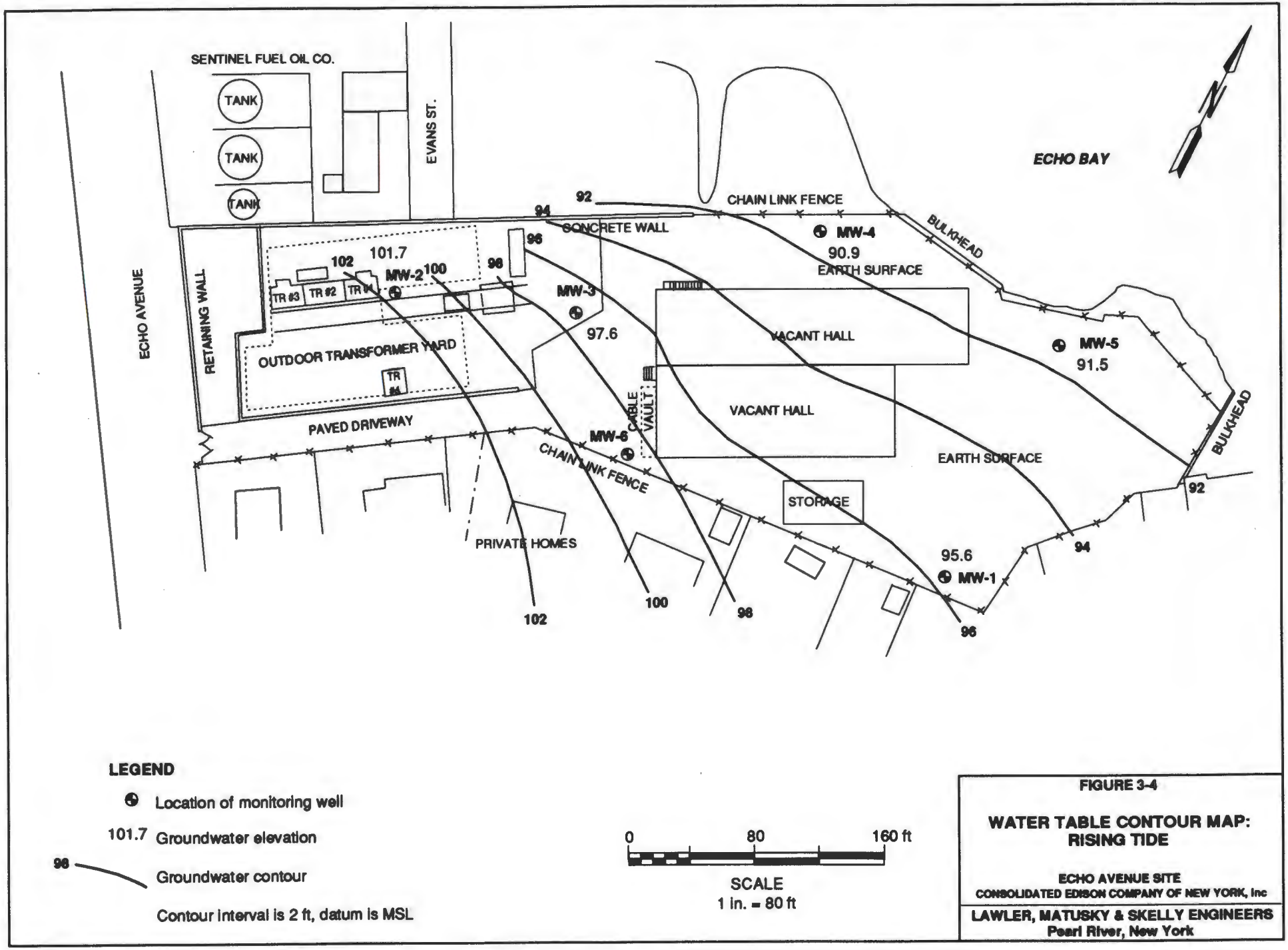
SCALE
1 in. = 80 ft

FIGURE 3-3

WATER TABLE CONTOUR MAP: LOW TIDE

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



LEGEND

- Location of monitoring well
- 101.7 Groundwater elevation
- 98 Groundwater contour
- Contour interval is 2 ft, datum is MSL

0 80 160 ft

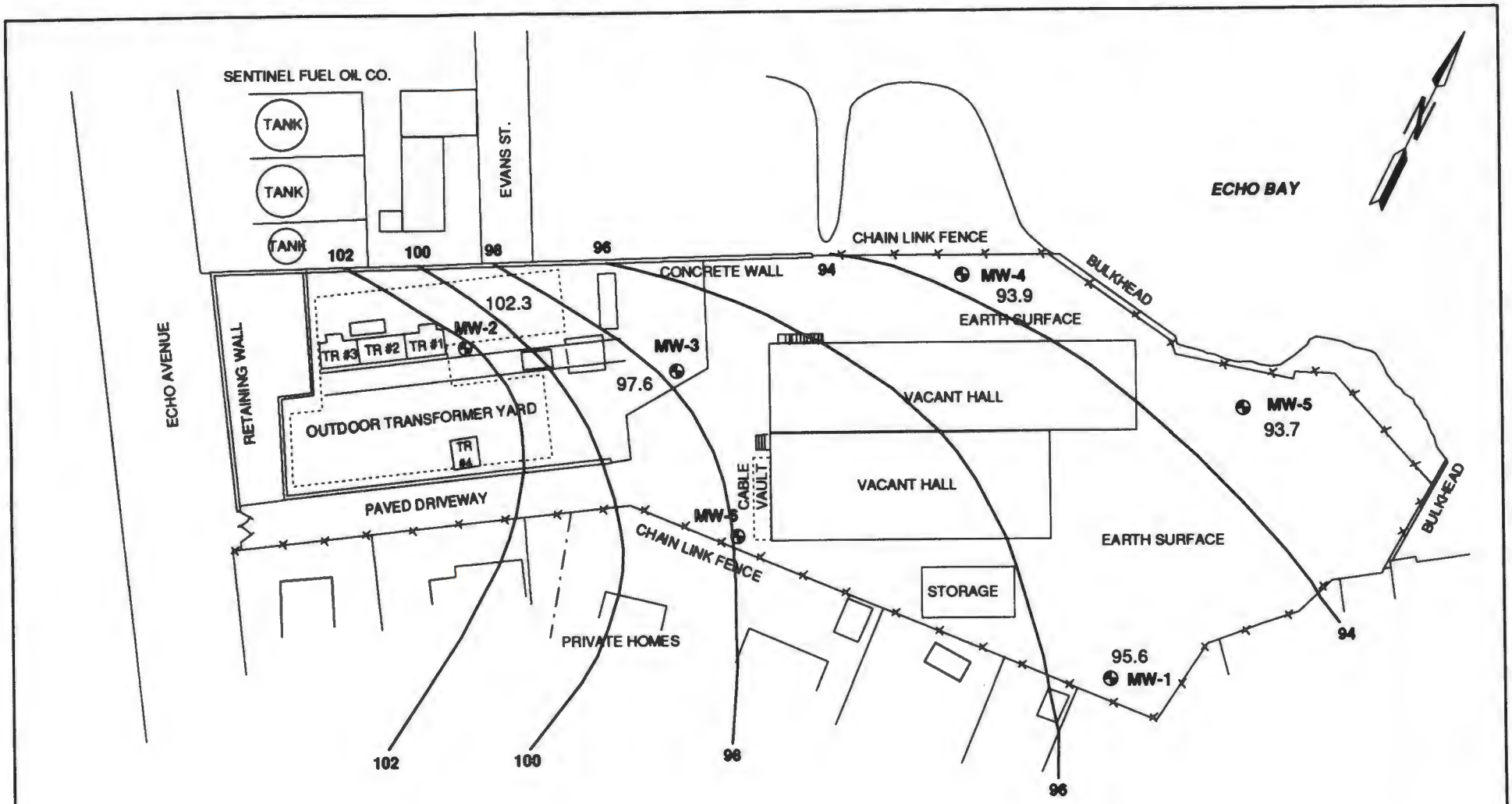
SCALE
1 in. = 80 ft

FIGURE 3-4

WATER TABLE CONTOUR MAP: RISING TIDE

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



LEGEND

- Location of monitoring well
- 101.7 Groundwater elevation
- 98 Groundwater contour
- Contour interval is 2 ft, datum is MSL

0 80 160 ft

SCALE
1 in. = 80 ft

FIGURE 3-5

WATER TABLE CONTOUR MAP: HIGH TIDE

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

3.3.2 Monitoring Well/Boring Details

EAMW-6 was installed on 21 July 1992 off the southwest corner of the south vacant building, about 8.5 ft north of an east-west running property fence (Figure 3-1) because the static water level in the nearest well (EAMW-3) showed that the tidal cycle in Echo Bay had no significant influence on groundwater in that area.

The borehole was advanced with 4.25-in. inside diameter (I.D.) hollow-stem augers. The soil was sampled ahead of the augers, using 2-ft-long, 2- and 3-in. I.D. split-spoon samplers. The 3-in. spoon was used to collect additional soil if needed to sufficiently fill sample jars. Immediately upon removal, each spoon sample was scanned with a 10.2-eV HNu PID and Foxboro OVA 128 flame ionization detector (FID). All auger cuttings and spooned soil were containerized in a labeled 55-gal drum.

The borehole was advanced through lightly laminated silt mixed with small amounts of sand and fine gravel. Soil color varied from dark brown at the surface, to orange at 8.5 ft (where water was encountered), to dark reddish-orange sand encountered at 12.5 ft. Black mica flakes (biotite) were present beginning at 6 ft, increasing in abundance with depth. The sequence of silt, sand, and gravel coarsened with depth and ended with refusal at 12.5 ft. A sample of the material from this depth contained greater quantities of mica with quartz sand and gravel. The augers continued to 15.5 ft, where competent bedrock was encountered (see well boring logs, Appendix D).

A monitoring well was constructed in the borehole, and prior to installing the screen a 1-ft layer of No. 0 Morie sand was poured in to a depth of 14.5 ft. The well was constructed with 10 ft of 2-in. I.D. Schedule 40 PVC 10-slot (0.010-in.) screen, and 5 ft of 2-in. Schedule 40 PVC riser. No. 0 Morie sand was poured into the annulus to 3.5 ft below grade. The well was then pumped to allow the sand pack to settle, closing any cavities that may have been present. The pumped water was drummed.

Bentonite pellets were emplaced and hydrated from 3.5 to 2 ft below grade. The remainder of the annulus was filled with a portland cement-bentonite mixture and a watertight flush-

mount curb box was emplaced in the grout. The PVC riser was sealed with a locking cap. A sloping cement wellhead was shaped around the curb box to direct rain water away from the wellhead. The well construction log is in Appendix D.

Static water level was measured at 6.66 ft below grade following the completion of construction on 21 July 1992.

3.3.3 **Well Development**

LMS developed the newly installed well, EAMW-6, on 28 July 1992. The well was developed with a peristaltic pump, dedicated tubing, and a Teflon bailer, with the purged water contained in drums on site. The well was alternately pumped and bailed. The bailer was rigorously surged up and down throughout the water column to act as a surge block and develop the entire sand pack. Specific conductance and turbidity were monitored during development. A total of 75 gal of groundwater was removed from the well. Turbidity values decreased to below 1 nephelometric turbidity unit (NTU) each time the well was pumped after surging it with the bailer. The development log for the well is presented in Appendix E.

3.4 SAMPLING

3.4.1 **Groundwater Sampling**

The newly installed monitoring well (EAMW-6), and five existing monitoring wells (EAMW-1, 2, 3, 4 and 5) were purged and sampled according to NYSDEC protocols; the samples were submitted to H2M Labs Inc. of Melville, New York, for analysis. All groundwater samples were analyzed for target compound list (TCL) organics (volatile and semivolatile fractions), TCL pesticides/PCBs, target analyte list (TAL) metals, and cyanide in accordance with NYSDEC Analytical Services Protocol (ASP).

Prior to sampling, the initial static water levels and monitoring well depths were measured with an electronic water level indicator to the nearest 0.01 ft. The volume of groundwater

to be purged from each well was calculated based on a borehole diameter of 8.5 in., a sand pack porosity of 32%, and the height of the water column. The monitoring wells were purged with a vacuum pump or centrifugal pump and dedicated polyethylene tubing. Because of tidal influences on the groundwater in EAMW-4 and 5, these monitoring wells were purged and sampled during a descending tidal cycle to ensure that groundwater collected from them was flowing from the site rather than from the bay. A staff gauge was placed in the bay near the northeast corner of the site to monitor the tidal fluctuations. Purged groundwater was drummed and staged on site.

Wells were initially purged from the bottom to remove any accumulated fines, and then the pumping rate was adjusted to maintain a steady recovery, if possible. The tubing was surged up and down in the water column and gradually raised through the water to the surface to ensure that the entire water column and sand pack were thoroughly purged. If the well purged dry before the calculated purge volume was achieved, the well was considered to be sufficiently purged. Turbidity, specific conductance, pH, and temperature were measured at various intervals during the purge process with calibrated instruments. The objective of the purging procedure is to ensure the presence of representative groundwater samples with turbidity values of 50 NTU or less to meet NYSDEC requirements of water clarity for sample analysis.

Following the purge process the monitoring wells were allowed to recover to at least 70% of the initial water column before sampling commenced. The monitoring wells influenced by tidal fluctuations did not recover fully because of the descending tide. EAMW-2 has a very slow recovery rate and only recovered 45% in 8 hrs during the first round of groundwater sampling. Samples were collected with dedicated, laboratory-cleaned, Teflon bailers from the water column surface. Temperature, pH, specific conductance, and turbidity measurements were collected at the start and end of sampling. Samples were placed in precleaned containers/vials provided by H2M. All sample bottles were labeled with the site name, job number, sample ID, date/time, and parameters for analysis. Preservatives were added in the field where applicable. Sample containers were packed in iced coolers to maintain a temperature of 4°C and delivered under chain-of-custody protocol to H2M for analysis via an overnight courier each day of sample collection.

3.4.1.1 ***First Round.*** Six groundwater monitoring wells and an Echo Bay surface water location were sampled by LMS on 30 and 31 July 1992. All sample locations and techniques were discussed with and approved by on-site NYSDEC oversight personnel before sampling commenced. During the first round of groundwater sampling all of the wells were purged with a vacuum pump and dedicated polyethylene tubing. For sample locations, see Figure 3-1. Sample data sheets and other associated logs are presented in Appendix F. Table 3-2 summarizes the chemical measurements made during purging and Table 3-3 presents the measurements made during sampling.

EAMW-1 was purged of 45 gal (3.4 well/borehole annulus volumes). Initially the water was very turbid and orange with iron-staining bacteria floc. The tubing was surged throughout the water column to clear the bacteria and fines from the well and sand pack. The groundwater turbidity ranged from 55 to 60 NTU during sample acquisition.

EAMW-2 was a very low-yielding well and was purged dry after 5.5 gal were removed (1 well/annulus borehole volume). A slight sulfur-type odor was noted during sampling. The well recovered 45% in 8 hrs. Turbidity of the samples used for analysis of metals and PCBs/pesticides was 98 NTU.

EAMW-3, another low-yielding well, was purged dry after 6 gal of groundwater were removed from the well (0.7 well/borehole annulus volumes). Prior to sample collection at this well, a field blank was collected using the Teflon bailer. EAMW-3 was then sampled with the same bailer. During sampling the turbidity quickly increased above 100 NTU. Because of this high turbidity, additional samples for dissolved TAL metals and dissolved TCL pesticides/PCBs were collected and filtered through a 0.45-micron filter for analyses to determine whether elevated metals and pesticides/PCBs concentrations were associated with silts and fines rather than the groundwater. A musty-type odor was detected in the groundwater samples.

EAMW-4 was purged of 38 gal of groundwater (3.5 well/borehole annulus volumes). The purge water was initially very silty and black, with orange iron bacteria floc. The groundwater cleared up slowly as purging continued. Turbidity ranged from 2 to 45 NTU during actual

TABLE 3-2
PURGE CHEMISTRIES
Con Edison Echo Avenue, New Rochelle, NY. July 30, 31, 1992

WELL	GALLONS PURGED	TEMP (C)	pH	CONDUCTIVITY (micro mhos/cm)	TURB (NTU)
EAMW-1	5	14.2	6.6	695	>1000
	12	14.3	6.8	715	50
	16	14.1	6.8	645	50
	23	13.8	6.5	652	13
	30	13.5	6.4	658	6.5
	35	13.1	7	695	23
	40	13.3	6.8	683	35
	45	13.1	6.9	693	22
EAMW-2	3	22	6.8	535	7
	5	20.8	6.9	528	35
	5.5	20.8	7.1	507	25
EAMW-3	3	18.2	7.2	442	45
	5	18	7.4	412	>1000
	6	17.4	7.3	403	200
EAMW-4	5	19.5	6.3		>1000
	12	19.8	6.6		59
	19	19.5	6.7	23200	63
	26	19.3	6.7	23900	20
	33	19.1	6.7	23900	13
	38	19	6.7	23700	3.5
EAMW-5	3	16.9	6	19800	80
	11	18.2	6.1	26400	16
	18	17.9	6.2	21000	45
	25	18.2	6.3	25000	30
	32	18	6.3	23200	20
	39	18.5	6.3	24200	4
	46	19.3	6.4	27200	5
	53	19.2	6.4	26700	20
EAMW-6	3	16	7	958	85
	8	15.8	7	937	15
	15	15.8	7	913	9.5
	19	15.6	7	928	11
	23	15.6	7	914	8.5
	29	15.7			15

TABLE 3-3
WATER CHEMISTRIES PRIOR TO AND FOLLOWING SAMPLING
Con Edison Echo Avenue, New Rochelle, NY. July 30, 31, 1992

WELL	TIME	TEMP (C)	pH	CONDUCTIVITY (micro mhos/cm)	TURB
EAMW-1	START	17.2	7	635	60
	FINISH	14.3	7	706	55
EAMW-2	START	conserved water for sampling			
	FINISH	20.2	7.2	568	275
EAMW-3	START	17.7	7.1	432	40
	FINISH	17.2	7	408	350
EAMW-4	START	20.2	6.6	23900	2
	FINISH	18.6	6.6	23100	40
EAMW-5	START	19.9	6.6	25900	20
	FINISH	19.5	6.7	29000	2.5
EAMW-6	START	18	7.1	892	5.5
	FINISH	17.1	6.6	957	42

sampling. A small sinkhole on the west side of the well exposing some of the concrete collar below grade was noted, but the well appeared intact.

EAMW-5 was purged of 3.75 well/borehole annulus volumes (56 gal). It was initially very turbid, with silts and iron-staining bacteria floc noted. To clean out the sand pack and accumulated fines the tubing was surged up and down throughout the water column and in the process the turbidity decreased slowly. The turbidity remained below 25 NTU during the sample collection procedures. A large depression, 2 ft deep and 6 ft in diameter, exposes the concrete seal on the west side of the well but does not appear to effect the overall integrity of the well.

EAMW-6 was purged of 29 gal of groundwater (3.5 well/borehole annulus volumes). During sampling the water turbidity remained below 50 NTU. A blind duplicate sample set of samples was taken at this well. The sample containers for each analytical parameter (volatile organics, metals, etc.) from both sets of bottles, labeled EAMW-6 and EAMW-7, were filled together to ensure that both sets of samples were homogeneous.

A surface water sample was collected from the bay (EAEBSW-1), offshore between EAMW-4 and EAMW-5. The sample was collected with a stainless steel dip bucket attached to a long pole to avoid disturbing the sediment during sample acquisition. Additional samples were collected at this location for matrix spike and matrix spike duplicate (MS/MSD) analyses.

3.4.1.2 ***Second Round***. LMS collected the second round of groundwater samples on 24 and 25 September 1992. A corresponding Echo Bay surface water sample was also obtained at that time. Monitoring wells with faster recovery rates were purged with a centrifugal pump rather than a vacuum pump for this round of sampling. Sample data sheets and other associated field logs are presented in Appendix F. Tables 3-4 and 3-5 summarize the chemical measurements made during purging and during sampling, respectively.

EAMW-1 was purged of 3.6 volumes of water (50 gal) before sampling commenced. The purged water was initially orange due to the presence of iron-staining bacteria floc, and a

TABLE 3-4
PURGE CHEMISTRIES
Con Edison Echo Avenue, New Rochelle, NY. September 24, 25, 1992

WELL	GALLONS PURGED	TEMP (C)	pH	CONDUCTIVITY (micro mhos/cm)	TURB (NTU)
EAMW-1	3	15.3	6.3	420	190
	10	15.2	6.1	356	3
	20	15.1	6.1	363	15
	30	15.1	6.1	382	2
	40	15.1	6.1	396	1.5
	50	15.1	6.1	403	1
EAMW-2	3	20.2	6.6	517	15
	4	19.7	6.6	524	30
	5	19.8	7	430	21
EAMW-3	3	17.3	7.4	444	45
	4	16.3	7.3	443	220
	5.5	18.2	7.3	534	9
EAMW-4	5	16.2	6.1	23818 @ 25C	40
	10	17	6.1		4.5
	15	17.8	6.1		0.8
	20	17.6	6.1		0.6
	25	17.6	6.1		0.5
	30	17.4	6.1	22730 @ 25C	3
EAMW-5	1	20.6	6.5	19295 @ 25 C	25
	10	19.9	6.3		0.5
	22	18.9	6.19		40
	27	19.7	6.12		2.5
	36	19.8	6.1		1
	46	20.2	6.12	14644 @ 25 C	1.1
EAMW-6	3	15.2	6.8	1.007	7
	6	15.5	6.8	0.986	3.5
	12	15.3	6.8	0.998	17
	15	15.5	6.8	1.008	2.5

TABLE 3-5
WATER CHEMISTRIES PRIOR TO AND FOLLOWING SAMPLING
Con Edison Echo Avenue, New Rochelle, NY. September 24, 25, 1992

WELL	TIME	TEMP (C)	pH	CONDUCTIVITY (micro mhos/cm)	TURB
EAMW-1	START	15.8	6.1	405	43
	FINISH	14.7	6.2	392	24
EAMW-2	START	18.2	7.2	445	9.6
	FINISH	18.8	7	250	76
EAMW-3	START	18.2	7	390	8
	FINISH	17.9	6.8	429	55
EAMW-4	START	17.4	6.2	23709 @ 25 C	0.5
	FINISH	17.2	6.2	23773 @ 25 C	5
EAMW-5	START	19.8	6.2	27860 @ 25 C	0.3
	FINISH	18.9	6.2	27813 @ 25 C	0.3
EAMW-6	START	15.7	6.5	982	11
	FINISH	15.8	6.4	951	75

slight sulfur-type odor was noted. Turbidity decreased quickly during the purge process. Turbidity values ranged between 20 and 45 NTU during sample acquisition.

EAMW-2 was purged dry after 5 gal were removed (1 well/borehole volume). This well had a very slow recovery and was allowed to recover 17 hrs before sampling commenced. A strong petroleum-type odor was noted from the well and purge water. An HNu PI-101 PID with a 10.2-eV lamp measured 500 HNu units when placed over the bucket holding the purge water. The purged water was light brown in color and turbidity measurements ranged from 15 to 30 NTU. During the sample collection procedure the turbidity increased from 10 to 76 NTU.

EAMW-3, another low-yielding well, was completely evacuated after removing 5.5 gal of groundwater (0.7 well/borehole volumes). A slight petroleum-type odor was noted during the purge process. Prior to sample acquisition a field blank was performed on the Teflon bailer. During sample acquisition the water turbidity increased from 8 to 55 NTU.

EAMW-4 was purged of 35 gal (3.3 well/borehole volumes) with a centrifugal pump. Initially it contained some iron-staining bacteria and had a slight petroleum-like odor. The HNu read 3 units above background over the well and purge water. Turbidity decreased and measurments, including pH, temperature, and specific conductance, stabilized quickly during the purge process. Sample water turbidity remained below 6 NTU during the collection procedures.

EAMW-5 was purged of 46 gal (3.1 well/borehole volumes) prior to sample acquisition. Turbidity decreased quickly during the purge process. An HNu reading of 25 units from the headspace inside the purge water drum was measured. Throughout the sample acquisition process the turbidity remained below 1 NTU.

EAMW-6 was evacuated with a vacuum pump. A total of 15 gal of groundwater was removed (1.9 well/borehole volumes); pH, temperature, and specific conductance stabilized quickly and turbidity values were low throughout the process. Turbidity values increased from 11 to 75

NTU during sample collection. A blind duplicate sample set labeled EAMW-7 was collected at this well.

An Echo Bay surface water sample, EAEBSW-1, was collected just off shore between EAMW-4 and EAMW-5. The sample was procured with a stainless steel dip bucket attached to a long pole to avoid disturbing the sediment during sample acquisition. Additional samples were collected here for MS/MSD analysis.

Because of a laboratory oversight the volatile organic samples from this second round of sampling were analyzed after the holding times had expired. On 15 and 16 December 1992 volatile organic samples from each of the wells and the bay surface water were collected following the same sampling procedures as used in the second round. The well logs and other associated field logs of this third sampling are presented in Appendix F. Tables 3-6 and 3-7 present the chemical measurements during purging and during sampling, respectively.

3.4.2 **Shallow Soil Sampling**

Twenty-five surface soil samples were taken throughout the site on 20 and 21 July 1992. The locations were approved by NYSDEC before sampling commenced. The composite depth intervals alternated from 0-3 in. and 0-6 in. between adjacent sample locations, except for the specific sample locations selected by NYSDEC, which were all 0- to 6-in. depth composites. This alternating sample composite depth procedure was selected because of the age and inactivity of the site. Potential PCB contamination could be found at varying depths, depending on recent soil deposition or removal and PCB contamination migration and transport routes. All the soil sampling logs are presented in Appendix F.

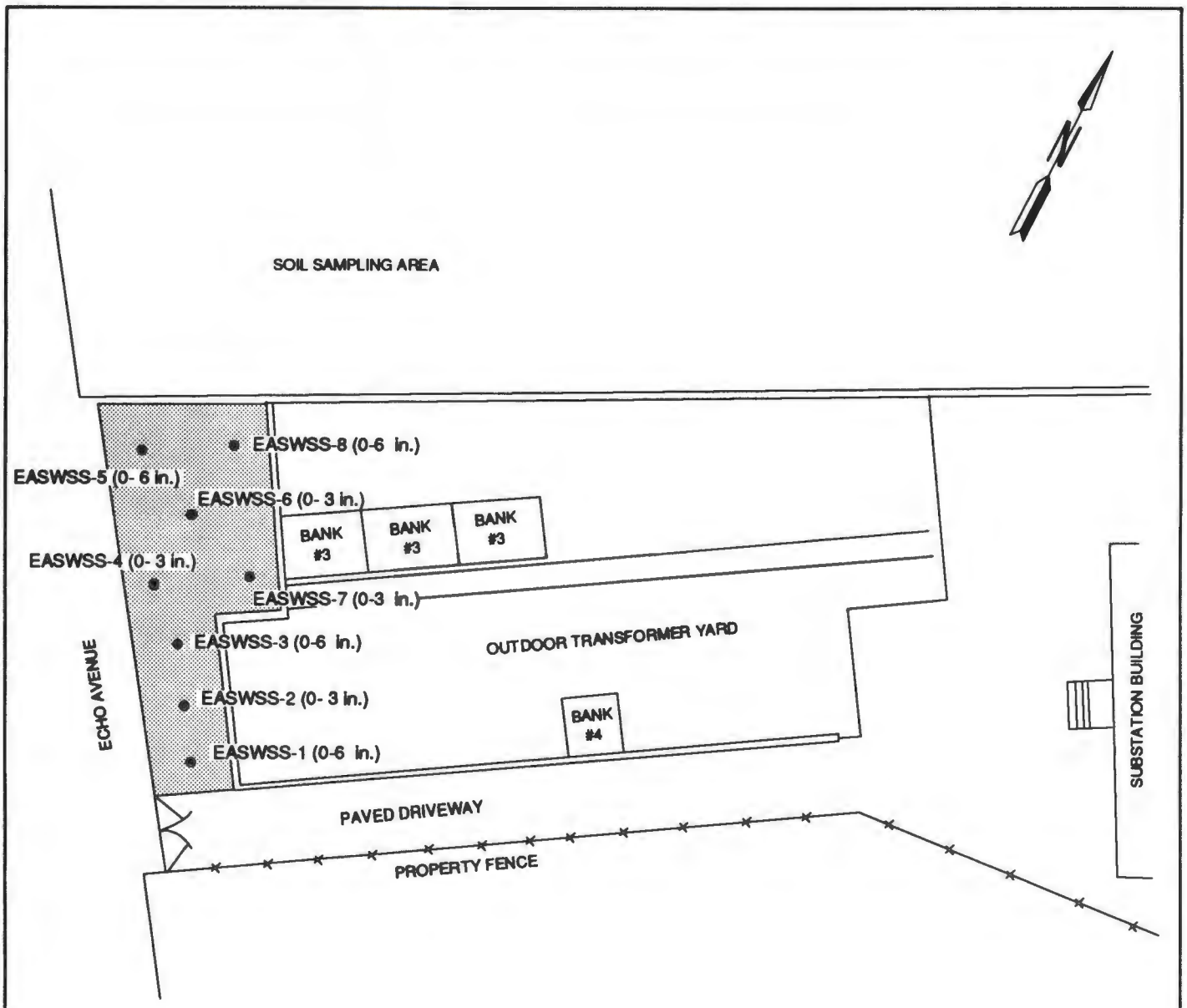
Eight soil samples were collected from the steeply sloping, unpaved area immediately southwest of the transformer yard bordered by Echo Avenue (Figure 3-6). Con Edison had the vegetative overgrowth from this area removed before sampling commenced. These composite samples were collected from 0-3 in. or 0-6 in. below grade as required and were labeled EASWSS-1 through -8.

TABLE 3-6
PURGE CHEMISTRIES
Con Edison Echo Avenue, New Rochelle, NY. December 15, 16, 1992

WELL	GALLONS PURGED	TEMP (C)	pH	CONDUCTIVITY (micro mhos/cm)	TURB (NTU)
EAMW-1	0	8.6	6.4	626	>200
	10	11	6.3	583	8
	20	10	6.3	581	3.5
	30	10.8	6.3	556	3
	40	10.9	6.3	552	3
	47	10.7	6.3	528	3.5
EAMW-2	1	18.1	7.4	933	450
	3	9	7.4	462	90
	6	9.1	7.4	438	90
EAMW-3	1	10.1	7.2	435	460
	4	11.5	7.1	457	550
	6.5	11.7	7.3	401	170
EAMW-4	1	18.5	6.8	16000	>200
	6	7	6.8	17500	110
	12	7.5	6.8	17500	9.5
	18	7	6.9	16900	6
	21	8	6.8	17500	2.5
EAMW-5	4	8	6.7	6900	120
	10	10.6	6.6	7000	67
	18	11	6.6	6800	16
EAMW-6	1	11.4	6.7	894	15
	10	11.5	6.6	916	4.5
	20	11.7	6.6	906	6
	32	11.8	6.7	912	7.5

TABLE 3-7
WATER CHEMISTRIES PRIOR TO AND FOLLOWING SAMPLING
Con Edison Echo Avenue, New Rochelle, NY. December 15, 16, 1992

WELL	TIME	TEMP (C)	pH	CONDUCTIVITY (micro mhos/cm)	TURB
EAMW-1	one chemistry taken after VOA collection				
		9	6.1	617	8
EAMW-2	one chemistry taken after VOA collection				
		9.4	7.4	429	125
EAMW-3	one chemistry taken after VOA collection				
		10.6	7	414	175
EAMW-4	one chemistry taken after VOA collection				
		8	6.8	17500	8
EAMW-5	one chemistry taken after VOA collection				
		10	6.7	9500	20
EAMW-6	one chemistry taken after VOA collection				
		9.9	6.8	931	250



LEGEND

- Soil sample point

0 50 100 ft

SCALE
1 in. = 50

FIGURE 3-6

SHALLOW SOIL SAMPLING AT SOUTHWESTERN END OF PROPERTY

ECHO AVENUE SITE
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Eleven sample locations were sampled from the area along the south and east property fence line (Figure 3-7). Again composite depth intervals alternated from 0 to 3 in. and 0 to 6 in. Five of these sample locations corresponded to five soil borings (continuously sampled from 1 to 4 ft below grade with split spoons) advanced at approximately the same location. A sixth boring was to be advanced along the fence near the south corner of the substation building, but because of possible underground utilities in this area and overhead restrictions the drill rig could not be safely employed. Instead, this sample location was dug with a shovel and stainless steel spoon to a depth of 4 ft to collect the samples. The sample locations along this property fence line were labeled EASESS-1 through -11 with a suffix for the appropriate depth interval.

Six soil samples were located by a NYSDEC representative at the site (Figure 3-8). All six of these samples were composites from 0 to 6 in. below grade. These soil samples were labeled EADEC-A through F. Prior to sampling NYSDEC-F, a field blank was taken from the stainless steel spoon; analyte-free water provided by H2M was poured over the spoon into a clean set of bottles. The field blank sample was analyzed for PCBs.

All but three of the soil samples were analyzed for PCBs and total solids in accordance with NYSDEC ASP. Three samples were analyzed for TCL organics (volatile and semivolatile fractions), TCL pesticides/PCBs, TAL metals, and cyanide in accordance with NYSDEC ASP. At one of the full TCL sample locations, EADEC-D, additional sample material was collected for MS/MSD analyses. H2M performed the analysis.

The shallow soil samples were collected by excavating a 3- or 6-in.-deep hole with a dedicated laboratory-cleaned stainless steel spoon. When the hole was deep enough and of sufficient diameter it was cleared of all loose soil. The walls of the hole were then scraped with the stainless steel spoon throughout the depth interval so that a composite sample of soil collected at the bottom of the hole where it was homogenized. The soil sample was then transferred with the spoon directly into the appropriate sample container(s).

At the three sample locations where TCL organic analyses were required, the hole was advanced to the required depth and cleared of loose soil. The undisturbed soil from the

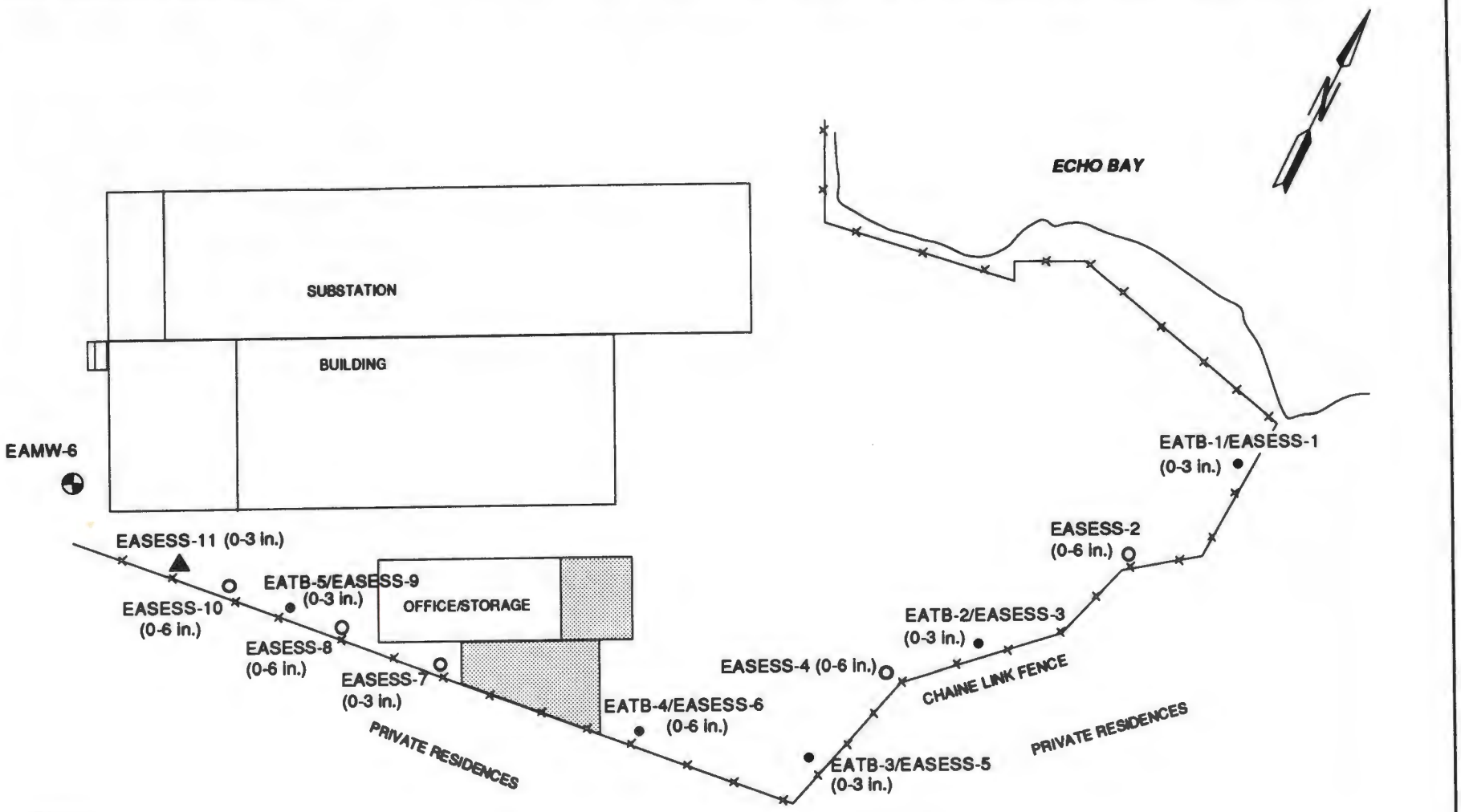

FIGURE 3-7

BORINGS AND SHALLOW SOIL SAMPLING ALONG SOUTHEASTERN EDGE OF PROPERTY

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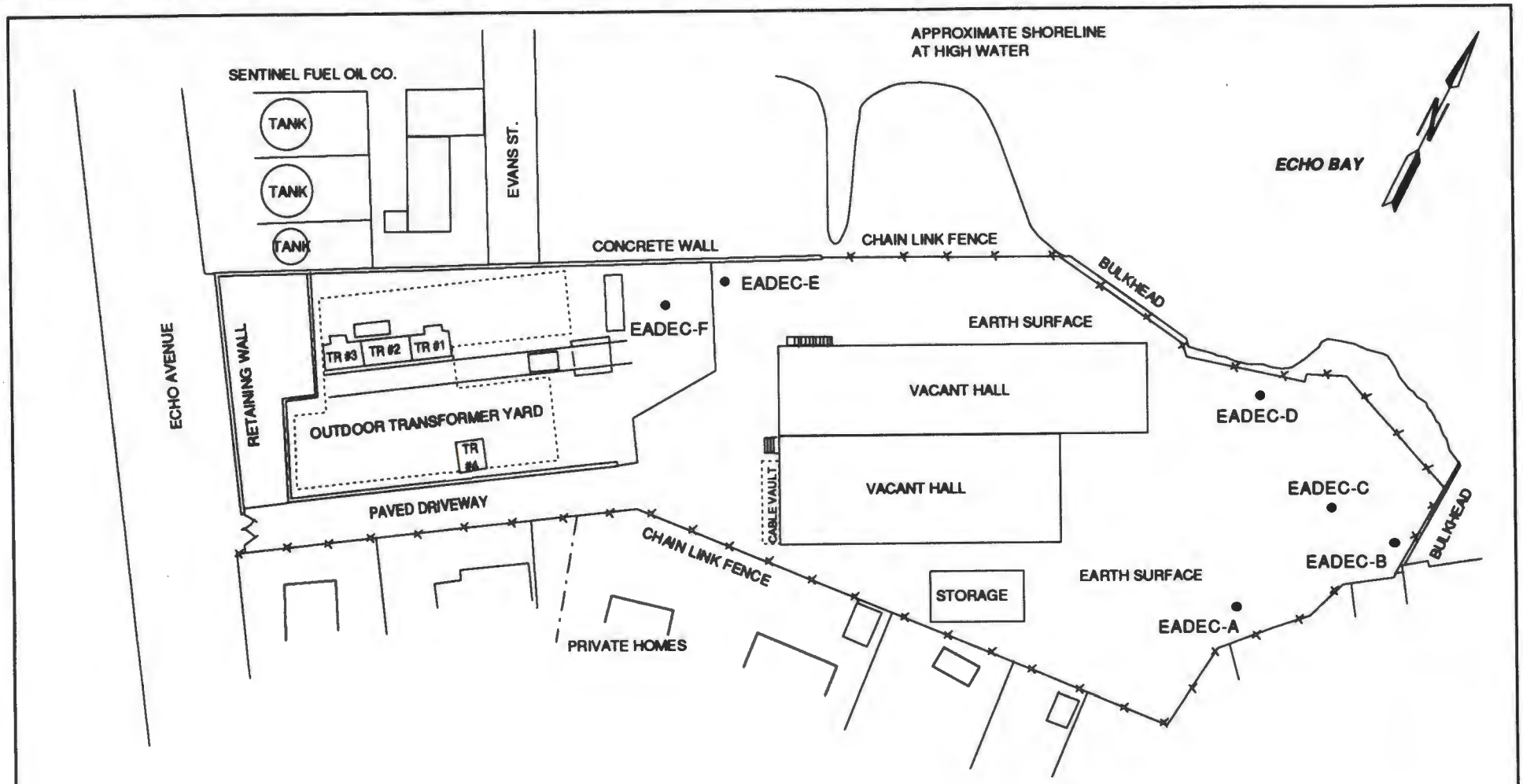

LEGEND

- Soil sample point

0 80 160 ft

SCALE
1 in. = 80 ft

FIGURE 3-8

NYSDEC SHALLOW SOIL SAMPLE LOCATIONS

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bottom of the excavated hole was then removed, quickly placed in sample vials, and sealed for volatile organic analysis. The composite sample procedure described above was then used to obtain the rest of the sample materials. Labeling, preservation, chain-of-custody, and shipping procedures were identical to those described for the groundwater samples.

3.4.3 Test Boring Sampling

Six shallow test borings (EATB-1 through -5 and EASESS-11) were installed along the southern and eastern property fences on 20 and 21 July 1992 (Figure 3-7). Each boring was advanced to a depth of 4 ft. Four borings (EATB-1, -2, -4, and -5) were advanced by an Associated Drilling of Meriden, Connecticut, drill rig equipped with a 2-in. I.D. split-spoon sampler driven by a 140-lb hammer that fell a distance of 30 in. (Standard Penetration Test ASTM D-1586).

EATB-3 was initially advanced with the drill rig. When split spoons yielded poor soil recoveries, the hole was relocated 5 ft west of the original location. Once again, the recoveries were small. This was attributed to large fill fragments (i.e., cobbles, bricks, cement), which blocked the opening of the split-spoon, preventing fine-grained material from entering. After the second attempt to use the split spoon was unsuccessful the soil was excavated with a hand shovel.

EASESS-11 was dug with a hand shovel because the location of the buildings and overhead and buried utilities made access impossible for the drill rig.

Where test borings were advanced with the drill rig, soil was continuously sampled in 1-ft increments with the split spoons. Normally, a 2-ft interval of soil is sampled with a 2-ft spoon, but small soil recoveries cannot be precisely located within the interval. Sampling in 1-ft intervals allows small recoveries to be identified within a particular 1-ft interval, which in turn allows a more precise soil boring log to be developed. This sampling method also facilitated collection of analytical samples from more specific intervals.

Split-spoon samples were scanned for organic vapors with a Foxboro OVA-128 FID and an HNu PID. Soil samples for laboratory analysis were collected from 1-2 ft, 2-3 ft, and 3-4 ft in each boring. Samples were submitted for PCB analysis to H2M.

Each sample was placed in laboratory-cleaned, amber-colored glass jars with Teflon-lined lids. The soil was handled with dedicated, laboratory-cleaned, stainless steel spoons.

3.4.4 **Echo Bay Sediment Sampling**

Eighteen Echo Bay sediment sample locations were sampled during low-tide periods at 20-ft increments along the property boundary bordering the bay on 15-17 and 20 July 1992 (Figure 3-9). Most of the samples were located 8-12 ft out from the high-water mark into Echo Bay. Some locations were moved with respect to the high tide mark (closer or further than 10 ft away) because of physical restrictions such as rocks and pilings. At three locations where there was a rock outcrop and no sediment flats exposed at low tide, the samples were collected approximately 3 ft out off the rock outcrop. In the drainage pipe area the samples were moved closer to the drain pipes where possible. Sample EAEBSD-18 was located just below the rock and wooden crib at the base of drainage pipe EADPSD-4. The sediment samples were analyzed by H2M for PCBs and total solids.

The bay sediment samples were collected with a stainless steel corer and dedicated laboratory-cleaned, stainless steel, core liners. In areas where the sediment appeared to be soft a styrene-core catcher was utilized to retain the sediment when the corer was retrieved. The corer was driven either by hand or with a metal pounder to a depth of 2 ft. After retrieval, the core liners were capped, labeled, and kept upright in a container with ice. Each night after sample collection the cores were extruded, examined, and described in the logs. The cores were then divided into four sections with dedicated stainless steel spoons and placed in sample containers for subsequent analysis by H2M. Due to compaction and possible loss upon penetration as materials were pushed out of the way, not all of the cores were 2 ft in length; therefore, the cores were divided into four equal sections (0-6 in., 6-12 in., 12-18 in., and 18-24 in.) regardless of recovery length.

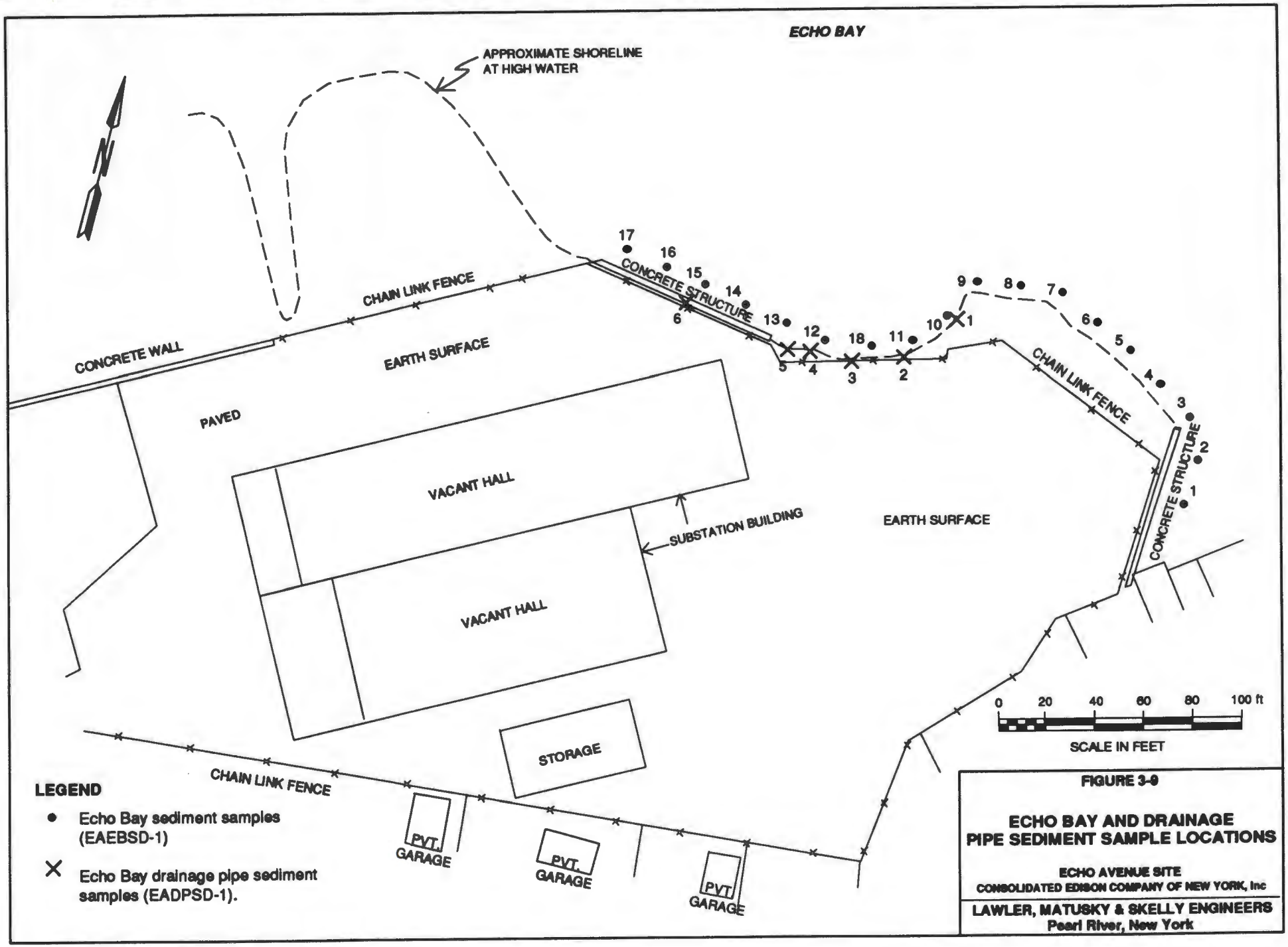

FIGURE 3-9

ECHO BAY AND DRAINAGE PIPE SEDIMENT SAMPLE LOCATIONS

ECHO AVENUE SITE
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Labeling, preservation, chain-of-custody, and shipping procedures were consistent with those described for the groundwater samples.

A field blank was performed on a laboratory-cleaned core liner before using it to sample EAEBSD-7. Field blank water provided by H2M was poured through the core liner inserted in the corer into a clean set of sample containers and analyzed for PCBs. At EAEBSD-10 an additional core was collected to supply the analytical laboratory with additional material for MS/MSD analysis.

3.4.5 **Drainage Pipe Sampling**

The sediment from six drain pipes that originate from the site were sampled on 15, 16, and 17 July 1992. The drain pipes emerged from the bank, and in one case the bulkhead, along the northern section of the property (Figure 3-9). The samples were analyzed by H2M for PCBs and total solids.

The drain pipe sediments were collected with dedicated laboratory-cleaned, stainless steel spoons attached to a long wooden pole. The sediment was scraped out of the pipe into a dedicated stainless steel bowls where it was homogenized in the bowl and transferred into the appropriate sample containers. Labeling, preservation, chain-of-custody, and shipping procedures were identical to those described for the groundwater samples.

EADPSD-1, an old 2.5-in.-diameter metal pipe, emerges from the bank at the eastern edge of the drainage pipe area. The sampling pole was only able to penetrate 12 ft into the pipe. Visually, the pipe runs east toward the concrete structure at the mouth of the inlet at the northeast edge of the property.

EADPSD-2 is a 6-in. diameter rusty metal pipe that appears to run toward the rectangular catch basin near EAMW-5. The sample pole was able to reach 16 ft into the pipe and scrape out material; very little sediment was found in the first 6 ft of the pipe. Additional material was collected from this pipe for MS/MSD analysis.

EADPSD-3 is an old, metal, 4-in.-diameter pipe running almost parallel with the bank below where the other pipes emerge toward the north corner of the north hall of the substation. The sampling pole was able to reach 16 ft into the pipe and scrape out sediment. Very little material was found in the first 4 ft of the pipe.

EADPSD-4 is a 12-in.-diameter concrete pipe with a rock and timber crib below its discharge end. It appears to make a slight bend toward the substation building 6 ft back from the edge of the bank. During a subsequent visit, stormwater was observed discharging from this drain pipe. The sampling pole was able to reach 16 ft into the pipe to collect the sediment. There was very little material in the first 6 ft of the pipe.

EADPSD-5, a 6-in.-diameter, old, metal pipe emerges from the bank near the metal bulkhead at the western edge of the drainage area and appears to extend toward EAMW-1, assuming there are not bends or turns in it. Prior to collecting this sample, a field blank was collected from the sampling spoon. Analyte-free water provided by H2M was poured over the spoon into a clean set of bottles and sent to the laboratory for PCB analysis. The sampling pole was able to collect material 16 ft into the pipe; there was very little material in the 0- to 3-ft section. Additional sample material was collected from this pipe for MS/MSD analysis.

EADPSD-6 is a pair of 4-in.-diameter rusty metal pipes emerging from a hole cut into the metal bulkhead west of the drainage area. These pipes discharge 7 ft above the sediment at the base of the bulkhead and appear to extend toward a catch basin inside the north hall of the substation. Only one of the pipes was able to be sampled because of the proximity of the pier structure on the adjoining property, which inhibited insertion of the long pole. The other pipe appears to have a constriction or blockage 6 ft back into the pipe. Enough sediment from the 0- to 6-ft section of the pipe was obtained for the PCB analysis and MS/MSD (PCB) analysis.

3.4.6 **Manhole Water and Sediment Sampling**

The former electrical manhole (MH-3) is a two-chamber underground structure located northeast of the No. 4 transformer moat (Figure 3-10). The two chambers are interconnected

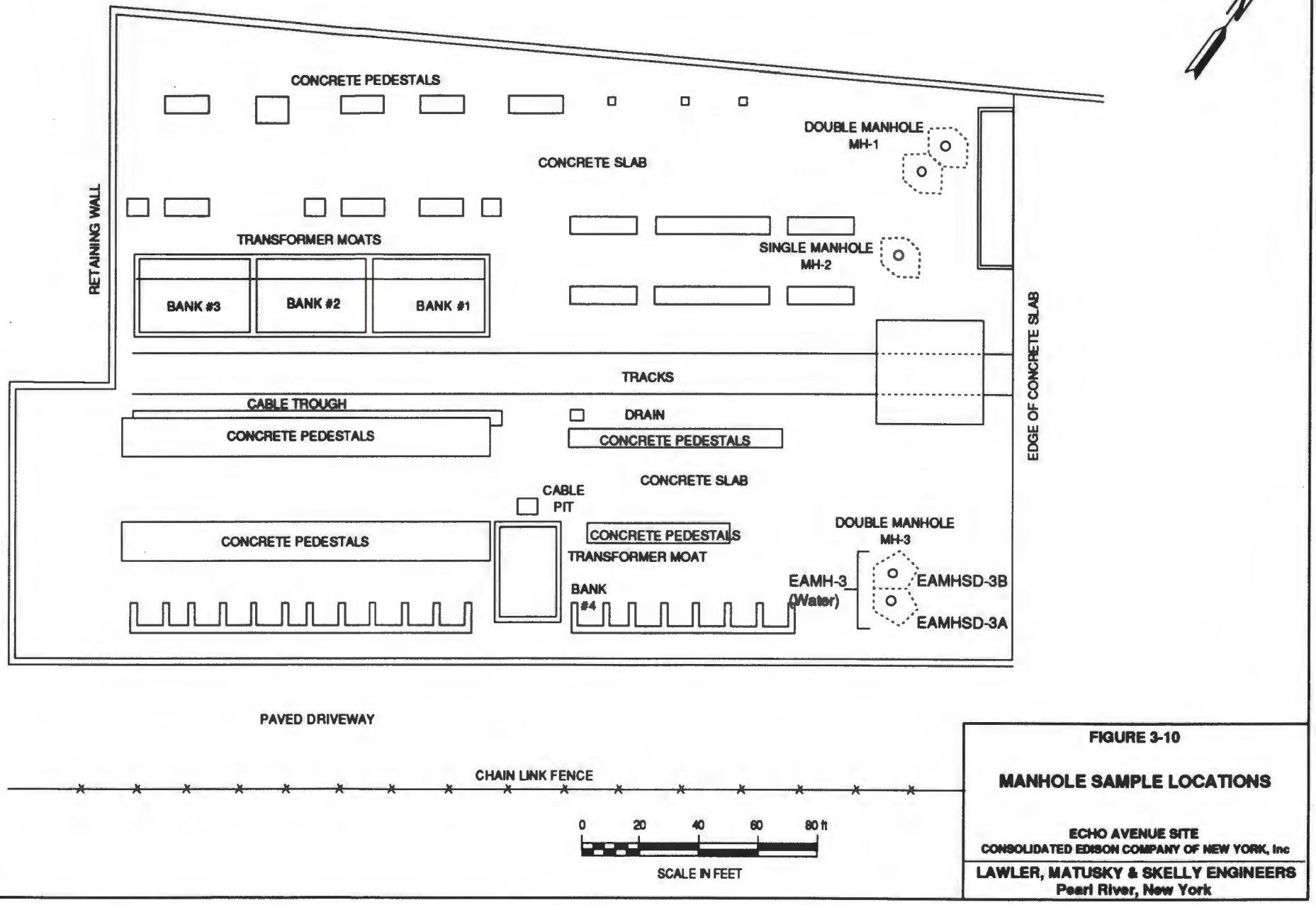

FIGURE 3-10

MANHOLE SAMPLE LOCATIONS

ECHO AVENUE SITE
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via openings in a common wall. A water sample and two sediment samples, one from each of the two chambers, were collected on 14 July 1992. The samples were submitted to H2M for PCBs analyses according to NYSDEC ASP. The sediment samples were also analyzed for total solids.

The water sample, EAMH-3, was collected with a dedicated laboratory-cleaned stainless steel dip bucket lowered into the water with a nylon rope. A musty, fetid odor was noted from the water and some sheen on the water surface was observed. The sediment samples, EAMHSD-3A and EAMHSD-3B, were collected with dedicated stainless steel ladles attached to a long wooden pole. Both chambers (EAMH-3A and EAMH-3B) contained 0 to 2 in. of fluffy decayed material with some silt and sand. Scraping the bottom appeared to release some oil because the sheen on the water surface and petroleum odor became stronger during sample acquisition. The samples were placed in properly labeled sample containers and stored in an iced cooler under chain-of-custody protocol and shipped out via courier to the analytical laboratory.

3.4.7 **Concrete Sampling**

Forty-two concrete samples and one soil sample were collected from the transformer yard on 22-24 July 1992. NYSDEC preferred the use of core/chip sampling for sampling concrete surfaces (Ref. 1, Appendix A). The former transformer yard is located in the western section of the site (see Figures 3-11 and 3-12). The sample sites included five transformer moats and oil-stained areas of the concrete slab and structures in the yard. The samples were submitted to H2M for PCBs analysis according to NYSDEC ASP.

The samples were collected by drilling into the concrete with a hammer drill and drill bit to a depth of 1 in.; because the analytical laboratory required pulverized sample material to facilitate analysis procedures, the concrete corer discussed in the work plan was not used. The on-site NYSDEC representative approved this modified concrete sampling method. The drill bit was decontaminated between sample locations according to field decontamination procedures outlined in the work plan. Several holes were drilled in each location to procure enough sample material to fulfill the analytical laboratory requirements. On horizontal

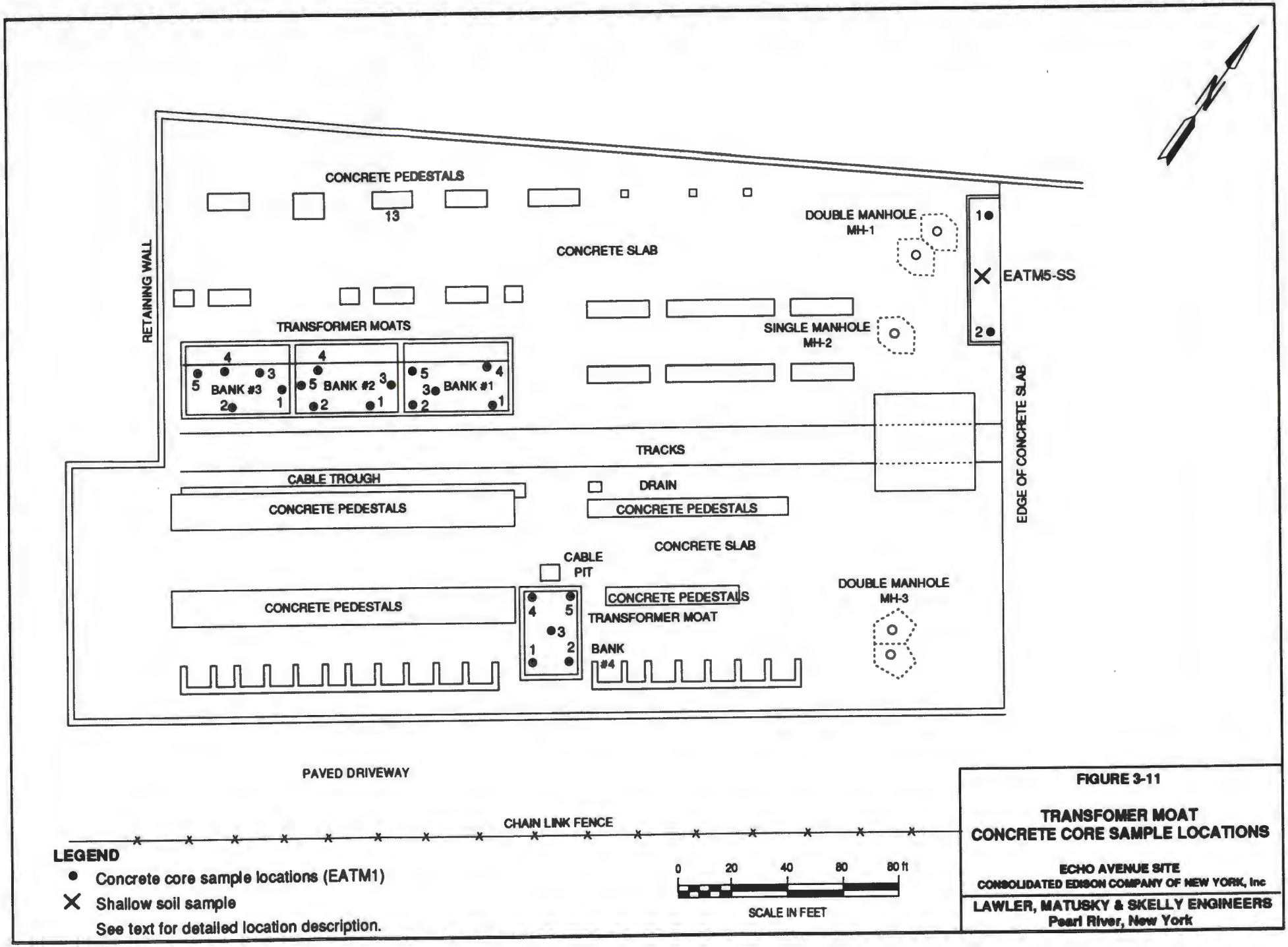

FIGURE 3-11

TRANSFOMER MOAT
CONCRETE CORE SAMPLE LOCATIONS

ECHO AVENUE SITE
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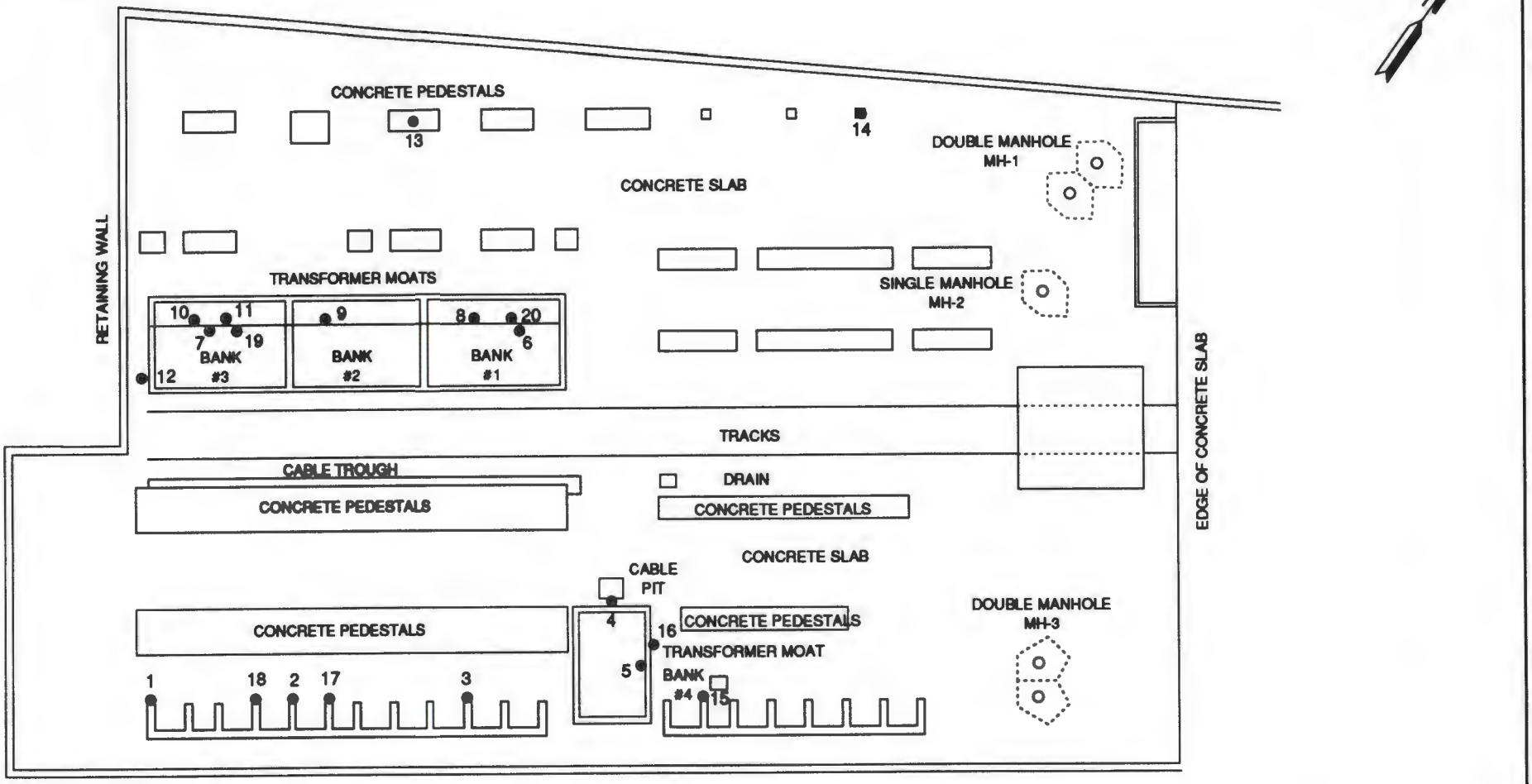

LEGEND

- Concrete core sample locations (EATAS-1)

See text for detailed location description.

0 20 40 60 80 ft

SCALE IN FEET

FIGURE 3-12

TRANSFOMER AREA STAINS
CONCRETE CORE SAMPLE LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

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Pearl River, New York

surfaces the pulverized material was collected with laboratory-cleaned dedicated stainless steel spoons and placed in the sample container. At vertical surface samples a pan, lined with dedicated autoclaved aluminum foil, was placed below the sample location to catch the material as it fell from the holes. This material was then placed in an appropriate sample container with a dedicated stainless steel spoon. Labeling, preservation, chain-of-custody, and shipping procedures were consistent with those described in the groundwater sampling section.

Five 1-in.-deep samples were collected from each of the four former concrete transformer moat floors as described in the work plan. A five-point grid was set up in each of the moats. Sample locations were moved where necessary to encompass the stained areas. The concrete structure at the north corner of the transformer yard was also found to be a transformer moat (EATM-5) that had not been included in the cleanup performed by Con Edison in 1987 and was still filled with crushed stone and dirt. Two concrete samples were collected from the floor in this moat below the crushed stone and dirt, and a sample of the dirt and crushed stone mixture was also sampled. Figure 3-11 indicates the locations of the transformer moat samples.

Twenty stained areas in the transformer yard were also selected for concrete sampling (Figure 3-12). These surfaces included moat walls, interior and exterior columns, and pedestals where stains were evident. The same sampling methods used for the transformer moats were used to sample these stained areas. During concrete sampling, two field blanks were collected from the sample equipment. Analyte-free water provided by H2M was poured over the decontaminated drill bit and sampling spoon into a clean set of bottles. When the field blank was performed for the stained area samples the field blank water was also poured over the autoclaved aluminum foil. The field blank samples were analyzed for PCBs.

3.4.8 **Structures Sampling**

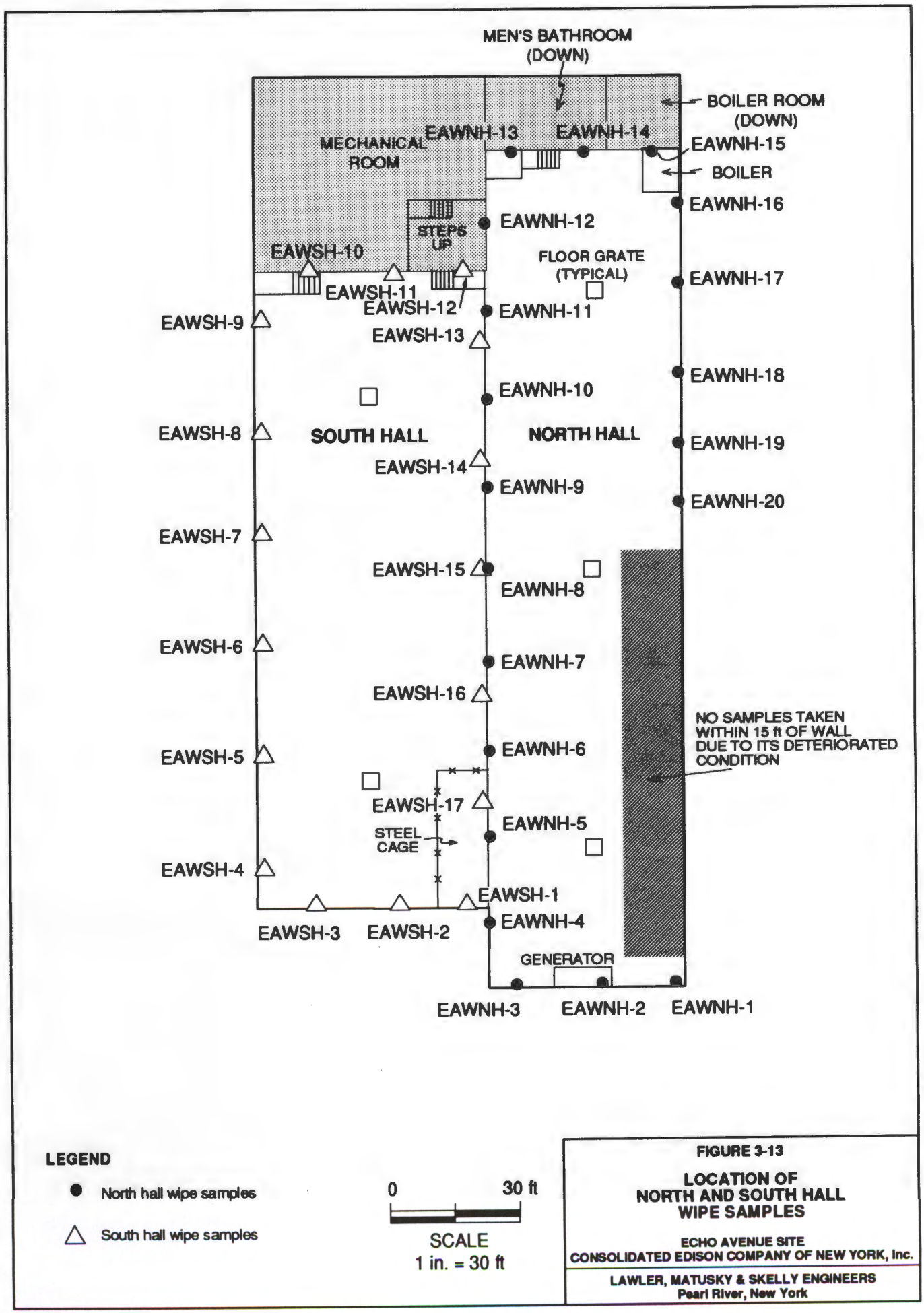
On 27, 28, and 29 July 1992, 239 wipe samples were collected from the interior walls and floors of the substation building halls and rooms. The wipe samples were analyzed for PCBs

by Camo Laboratories, Inc., of Poughkeepsie, New York, according to NYSDOH Analytical Method 312-3 protocols.

The wipe sample locations were delineated with 10-m x 10-cm aluminum templates. The 100-cm^2 area inside the template was sampled with sterile 3-in. x 3-in. gauze pads provided by Camo soaked with 10 ml of pesticide-grade hexane. The entire area inside the template was wiped firmly with even pressure, once in the horizontal direction and once in the vertical direction. The gauze pads were then placed in sample containers provided by the laboratory. The type of surface wiped (e.g., brick, vinyl tile) and surface coatings, if any, such as paint, that could affect the analysis of the samples were noted in the wipe sample data sheets presented in Appendix F. Disposable nitrile gloves were used by the samplers to avoid the possibility of interference caused by the contact of the solvent-soaked wipes with latex gloves. The templates were decontaminated in the field according to the procedures outlined the work plan. The sample containers were labeled, placed in iced coolers under chain-of-custody protocols, and shipped via a courier to Camo the day after sample collection. Two field blanks were collected using the wipe sample equipment. A field-decontaminated aluminum template was wiped with a hexane-soaked gauze pad and returned to its sample container for PCBs analysis.

In each of the vacant halls, wipe samples were collected from the interior walls at 20-ft lateral increments where possible. A few locations were moved a few feet to avoid obstructions, or openings in the walls. At each location, wipe samples were collected at 2 and 8 ft above the floor (Figure 3-13). The eastern half of the northern exterior wall was not sampled because of safety concerns about its deteriorating condition. Wipe samples were performed on the concrete floors from each of the two halls. Nineteen floor wipes were collected from each hall (Figure 3-14). Dirt and dust on the floor were not removed before the wipe samples were taken. Because of deteriorating wall conditions, floor samples were also not collected within 15 ft of the eastern half of the northern exterior wall.

Wipe samples were collected from the walls of the basement room located in the southwest corner of the substation building. The samples were collected at 10-ft lateral increments where possible; a few locations were moved slightly to avoid obstructions or doorways. At



LEGEND

- ● North hall wipe samples
- △ South hall wipe samples

0 30 ft

SCALE
1 in. = 30 ft

FIGURE 3-13

LOCATION OF NORTH AND SOUTH HALL WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

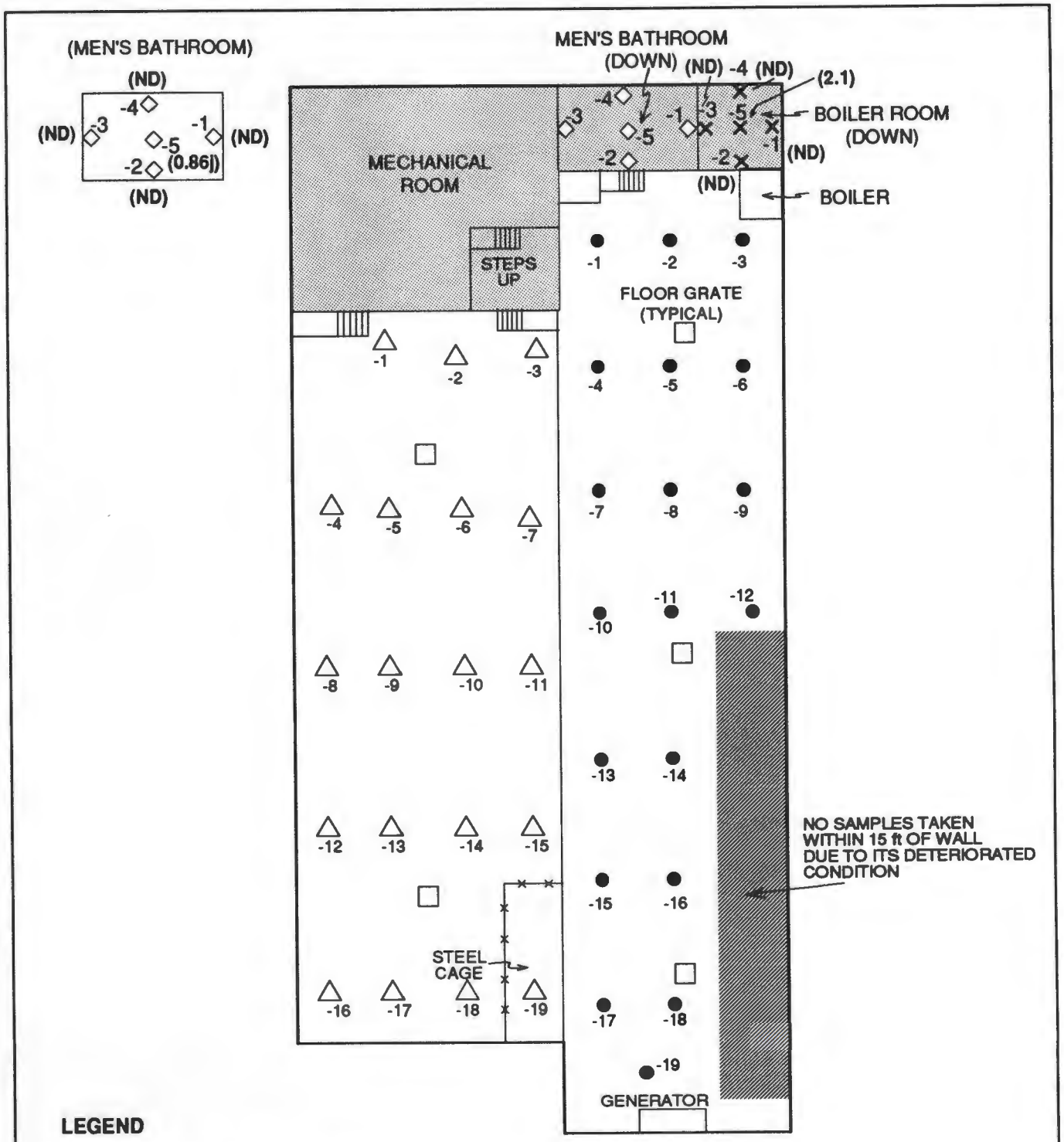


FIGURE 3-14

LOCATION OF NORTH AND SOUTH HALL, MEN'S BATHROOM AND BOILER ROOM WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

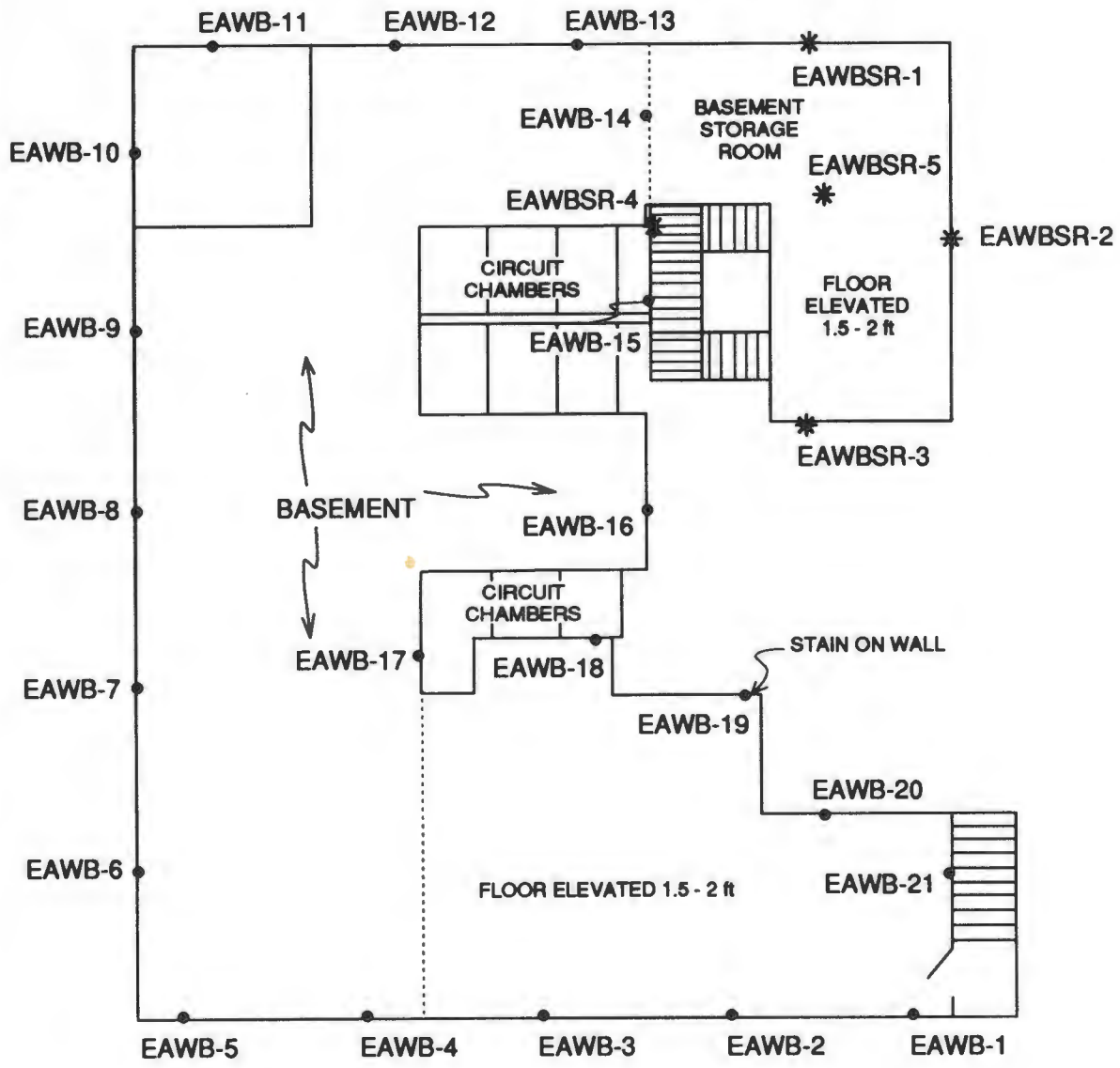
each location, wipe samples were collected at 2 and 8 ft above the basement floor (Figure 3-15). No floor wipes were collected from the basement because the floor had been sampled in a previous study performed by Con Edison. The lower section of the basement floor was flooded with water while during sampling.

Thirty-five wipe samples were collected from the former feeder regulatory compartments. Wipe samples were collected from each of the three walls of the five regulator compartments that once contained PCB-contaminated regulators. A Con Edison representative designated the aforementioned compartments (146C, 146B, 146A, 148B and 148A) to be sampled. The floors of these compartments had been sampled in a previous study conducted by Con Edison. Five other compartments that contained non-PCB regulators were randomly selected and one floor and three wall wipe samples were collected from each compartment. Figure 3-16 presents all sample compartment locations.

Wipe samples were also collected from the remaining rooms on the three floors in the western end of the substation building. Samples were collected from the midpoint of the floor and each of the four walls where possible, for a total of five wipe samples per room. A few locations were moved to avoid obstructions, doorways, or windows. Samples were collected from a total of 10 rooms, including bathrooms, offices, a control room, a boiler room, a washroom, a storage room, and an auxiliary room (Figures 3-14, 3-15, 3-17, and 3-18).

3.4.9 **Potable Water Sampling**

A sample of the potable water source used during installation of EAMW-6 was collected. The sample was collected from the water tank on the Associated Drilling Co., Inc., drill rig that had been filled from a New Rochelle Water Co. potable water source. The sample was analyzed for PCBs by H2M. This potable water was used only during this well installation phase; for field decontamination of equipment, deionized/distilled water was used.



LEGEND

- ● Basement wipe samples
- ✱ Basement storage room wipe samples

0 10 ft

SCALE
1 in. = 10 ft

FIGURE 3-15

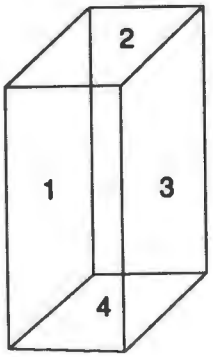
LOCATION OF BASEMENT AND BASEMENT STORAGE ROOM WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

FEEDER ROOM COMPARTMENT SAMPLES

146C	Formerly PCB Contaminated	EAFRW-1, 2, 3
146B		EAFRW-4, 5, 6
146A		EAFRW-7, 8, 9
148B		EAFRW-10, 11, 12
148A		EAFRW-13, 14, 15
147B	Non-PCB Contaminated	EAFRW-16, 17, 18, 19
TRANSFER CIR. B		EAFRW-20, 21, 22, 23
142C		EAFRW-24, 25, 26, 27
149C		EAFRW-28, 29, 30, 31
144 (3rd floor)		EAFRW-32, 33, 34, 35



- 1st sample (left wall)
- 2nd sample (back wall)
- 3rd sample (right wall)
- 4th sample (floor)

PCB Contaminated compartments did not get floor samples
(Only 3 wall samples per compartment)

FIGURE 3-16

LOCATION OF FEEDER ROOM WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

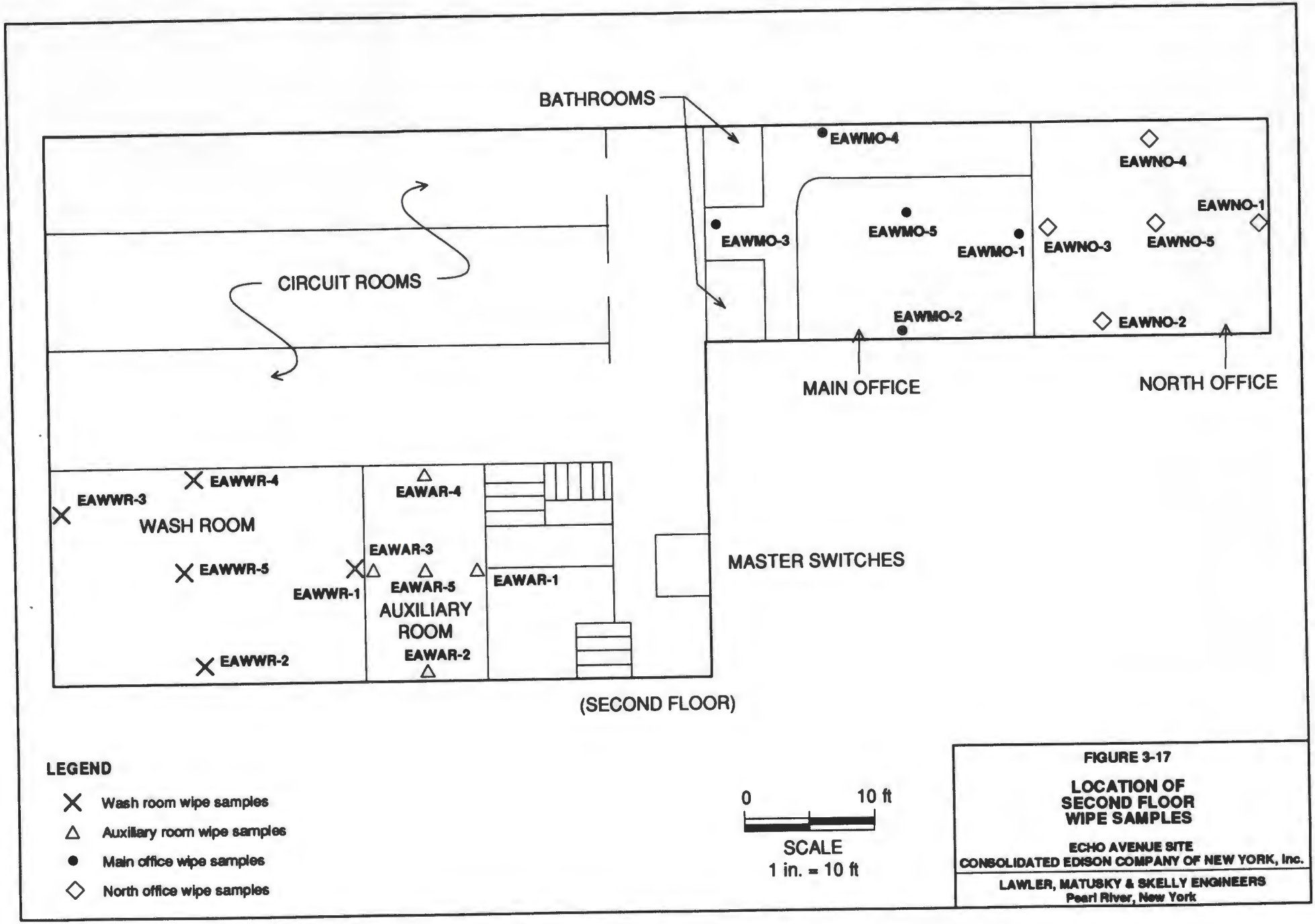


FIGURE 3-17

LOCATION OF SECOND FLOOR WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

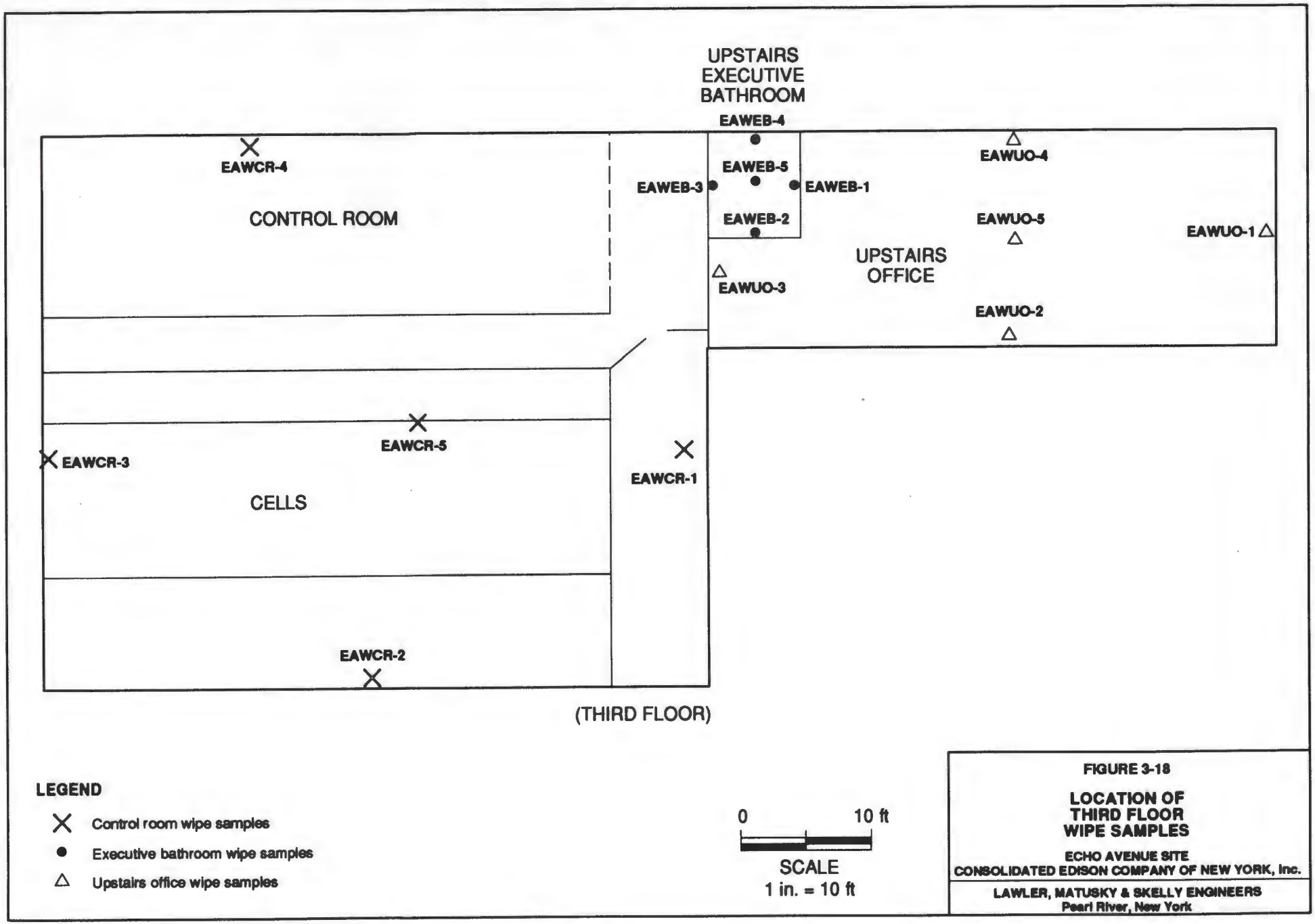


FIGURE 3-18

LOCATION OF THIRD FLOOR WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

3.5 AIR MONITORING

Air monitoring was conducted during all site activities. Organic vapors were monitored with an HNu Systems PI-101 PID with a 10.2 eV-lamp. Particulates, dusts, and mists were monitored with a MIE Miniram (Miniature Real-time Aerosol Monitor) Model PDM-3 that detects and measures scattered electromagnetic radiation in the near-infrared portion of the spectrum. The HNu PI-101 was calibrated in the field with an appropriate calibration gas at the start of each day. The Miniram PDM-3 was factory-calibrated and was not rezeroed in the field. Air in the breathing zone was monitored downwind of the on-site activities at regular intervals and occasionally upwind to observe background conditions. No elevated downwind readings were observed on the PID or particulate monitor during any of the site activities. Background readings fluctuated slightly due to normal weather conditions (e.g, wind, temperature, humidity, soil moisture), but there were no elevated HNu or Miniram levels measured at the downwind site. Some elevated HNu readings were observed over a few wells and purged water but the readings quickly returned to background conditions when the detector was moved 1-2 ft away. The daily health and safety reports and meter calibration sheets are presented in Appendix B.

CHAPTER 4

SITE ASSESSMENT

4.1 SITE HISTORY

The Echo Avenue site, originally owned by Westchester Lighting Company, was acquired by Con Edison in the 1930s and operated as an electrical distribution substation until its retirement in 1981. The site is approximately 2.35 acres in size and is bounded by Echo Bay to the north, Sentinel Fuel Oil Company on the northwest corner, Echo Avenue on the west, and commercial and residential properties to the south and east. Echo Bay, part of Long Island Sound, experiences tidal fluctuations of up to 10 ft above mean sea level (Ref. 2, Appendix A). Groundwater beneath the site is somewhat influenced by the tide with fluctuations of 4.5-6.2 ft observed in wells that are about 35 ft from the shoreline.

The site has been listed on the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites since January 1988 and is currently classified as 2A, which is a temporary classification assigned to sites that have inadequate and/or insufficient data for inclusion in any other classifications (Ref. 3, Appendix A).

In February 1988 Con Edison submitted a report to NYSDEC entitled "Report on Consolidated Edison Company's Echo Avenue Site, New Rochelle, New York" (Ref. 4, Appendix A). This report summarized the site investigation and cleanup activities that had been undertaken by Con Edison from 1985 to 1987, including the results of sampling that reflected residual PCB concentrations as of the submittal of that report. Based on these findings, Con Edison requested that the site be reclassified from 2A to 5 (i.e., site properly closed, no evidence of present or potential adverse impact - no further action required). In a letter dated 6 June 1988, NYSDEC requested additional information about the site (Ref. 5, Appendix A). A meeting was held on 17 June 1988 between Con Edison and NYSDEC to discuss comments on the report and the request for additional information. These comments were formalized in a letter to Con Edison from NYSDEC on 20 July 1988 (Ref. 1, Appendix A) and included additional sampling requirements. Subsequent additional

correspondence between Con Edison and NYSDEC clarified the additional sampling programs requested by NYSDEC (Ref. 6, and 7, Appendix A).

On 26 May 1989 Con Edison submitted a draft sampling plan to NYSDEC (Ref. 8, Appendix A). NYSDEC approved this draft sampling program with some exceptions and additions (Ref. 9, Appendix A). One of the additional items requested by NYSDEC was submittal of a formal work plan for the additional work for NYSDEC approval.

Based on the May 1989 approved sampling plan, Con Edison in May 1990 retained Lawler, Matusky & Skelly Engineers (LMS) to prepare the work plan and conduct additional site investigations. The final work plan prepared by LMS was submitted in February 1992 (Ref. 10, Appendix A). Con Edison responded to comments received from NYSDEC and the New York State Department of Health (NYSDOH) on this plan in a letter dated 31 March 1992 (Ref. 11, Appendix A). Con Edison signed an administrative Order on Consent with NYSDEC on 22 May 1992 to conduct the Phase II investigation in accordance with the approved work plan (Ref. 13, Appendix A). On 6 July 1992 Con Edison received notification from NYSDEC that LMS was acceptable to perform the Phase II investigation (Ref. 15, Appendix A).

4.1.1 **Previous Site Remedial Efforts**

From 1984 to 1987 Con Edison voluntarily sampled and cleaned up the site. The following paragraphs summarize the sampling program, cleanup efforts, and postcleanup sampling conducted during this time.

In 1984, Con Edison sampled and analyzed for PCBs the oil in all oil-filled electrical equipment installed at the site. Of the total of 234 electrical equipment items sampled, 215 indicated non-detectable PCBs, five had detectable PCB concentrations of less than 10 ppm, three contained greater than 10 ppm but less than 50 ppm PCBs, and 11 items contained PCBs in excess of 50 ppm. The highest PCB concentration detected in the electrical equipment installed at the site in 1984 was 287 ppm. The eleven PCB-contaminated electrical equipment items and their respective PCB concentrations are presented in Table 4-1; the

TABLE 4-1

ECHO AVENUE SITE PCB-CONTAMINATED EQUIPMENT - 1984

EQUIPMENT	FIRST SAMPLING			RESAMPLING		
	PCBs (ppm)	LAB REPORT No.	DATE ANALYZED	PCBs (ppm)	LAB REPORT No.	DATE ANALYZED
Spare 13-kv regulator, serial No. 4515293	239	SA-775	05/06/84		--	
Spare 13-kv regulator, serial No. 4515294	123	SA-775	05/06/84		--	
Bank No. 2 auto transformer A0	203	SA-773	05/03/84	213	SA-964	06/05/84
Bank No. 2 auto transformer C0	104	SA-773	05/03/84	103	SA-964	06/05/84
Bank No. 2 12,000 KVA transformer, serial No. 3195692	69	SA-747	09/11/79	LT 10	SA-964	06/05/84
Bank No. 2 7,500 KVA transformer, serial No. 5001313	167	SA-747	09/11/79		--	
FDR 146 voltage regulator A0	197	SA-773	05/03/84	167	SA-964	06/05/84
FDR 146 voltage regulator B0	265	SA-773	05/03/84	287	SA-964	06/05/84
FDR 146 voltage regulator C0	120	SA-773	05/03/84	126	SA-964	06/05/84
FDR 148 voltage regulator A0	119	SA-701	05/01/84		--	
FDR 148 voltage regulator C0	143	SA-701	05/01/84		--	

locations of this equipment within the site is indicated in Figure 4-1. All oil-containing equipment was drained in 1984. Non-PCB oil (less than 50 ppm PCBs) was transported to Con Edison's Astoria Generating Station for energy recovery in the Station's high-efficiency boilers. PCB-contaminated oil drained from the equipment was placed in DOT-approved drums and transported to Con Edison's Astoria PCB Storage Facility for storage prior to disposal in accordance with 40 CFR Part 761.

During 1984 and 1985, Con Edison performed PCB sampling of the site's soils and various structures to determine the requirements and extent of cleanup. On the basis of the sampling, analytical results, and field observations of oil-stained areas, Con Edison performed the first cleanup of the site in 1985. Specifically, this first cleanup effort involved the areas identified in Figure 4-2 as Cleanup Areas A through F and consisted of the following:

Cleanup Area A: Soil and gravel in a narrow (6 ft to 10 ft wide) strip along the northern wall of the substation building was removed to a depth of 10 in. Four samples collected from the bottom of the excavation indicated either nondetectable or less than 10 ppm PCBs (Table 4-2, Figure 4-3, Samples Nos. 1 through 4). In addition, 39 surface soil samples were collected from the area between the edge of the excavation area described above and the property fence line in 1984. The grid of this soil sampling is shown in Figure 4-3 and the PCB analytical results are presented in Table 4-2 (page 2). All 39 samples indicated either non-detectable or less than 10 ppm PCBs.

Cleanup Area B: This area used to contain two spare, PCB-contaminated 13 KV regulators. After the regulators were removed, the dirt on the top of the concrete slab on which the regulators rested was removed and the oil-stained areas of the concrete slab were double washed and rinsed. Two post-cleanup wipe samples collected from the slab indicated PCB residual concentrations of 0.6 $\mu g/100\ cm^2$ and less than 0.1 $\mu g/100\ cm^2$, respectively.

Cleanup Area C: Dirt deposits from the five drains located inside the two vacant halls of the substation building were removed.

Cleanup Area D: This cleanup area included the vault of the 12,000 KVA, PCB-contaminated transformer of Bank No. 2. After the transformer was removed, crushed stone and dirt were removed from the vault, and the vault concrete floor was twice double scrubbed, washed, and rinsed. A post-cleanup wipe sample collected from the vault floor indicated less than 0.1 $\mu g/100\ cm^2$ residual PCBs.

Cleanup Area E: A thin layer of oil floating on the water surface was observed inside the underground concrete cable vault located adjacent to the western wall of the

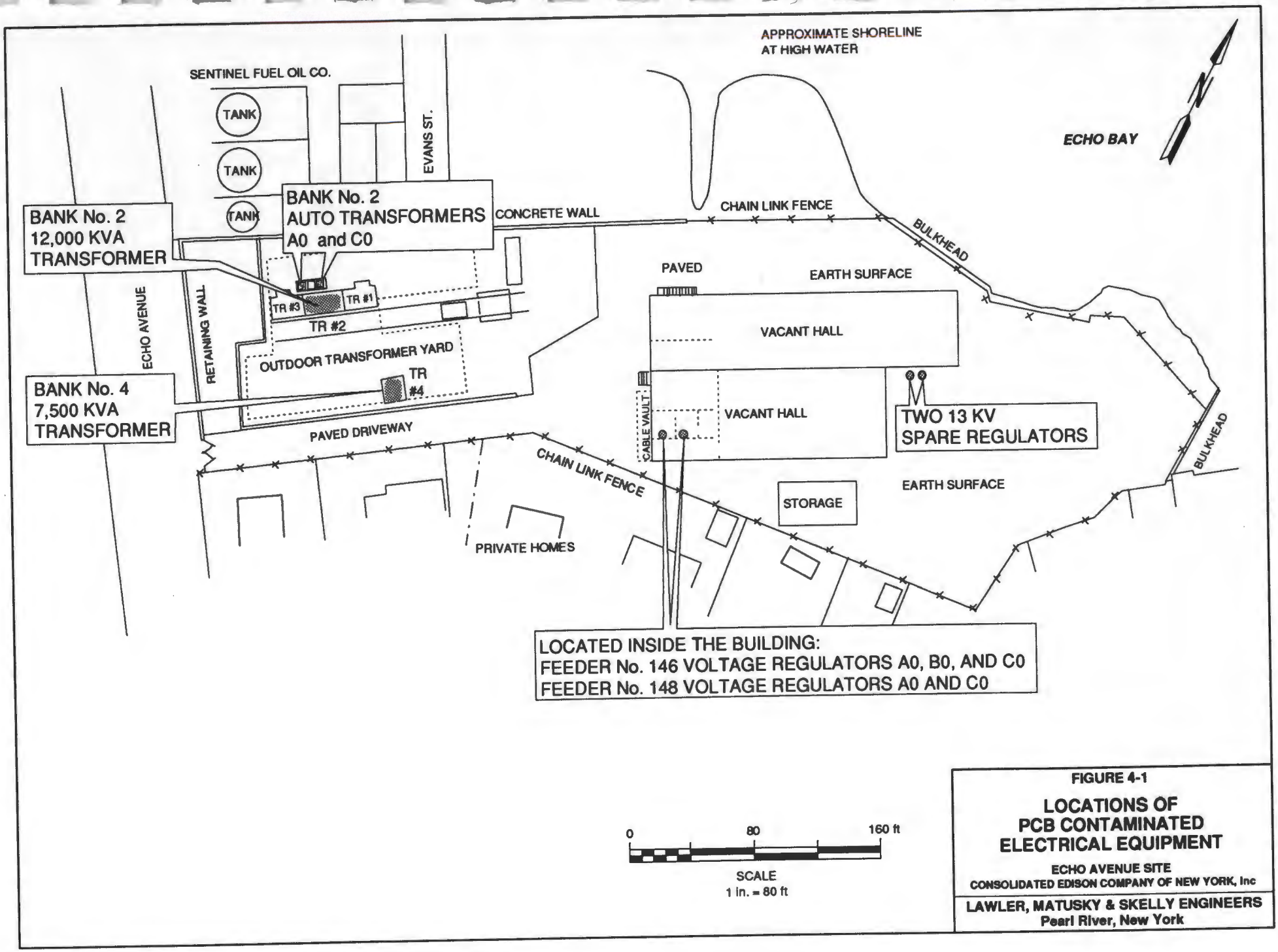


FIGURE 4-1

LOCATIONS OF PCB CONTAMINATED ELECTRICAL EQUIPMENT

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

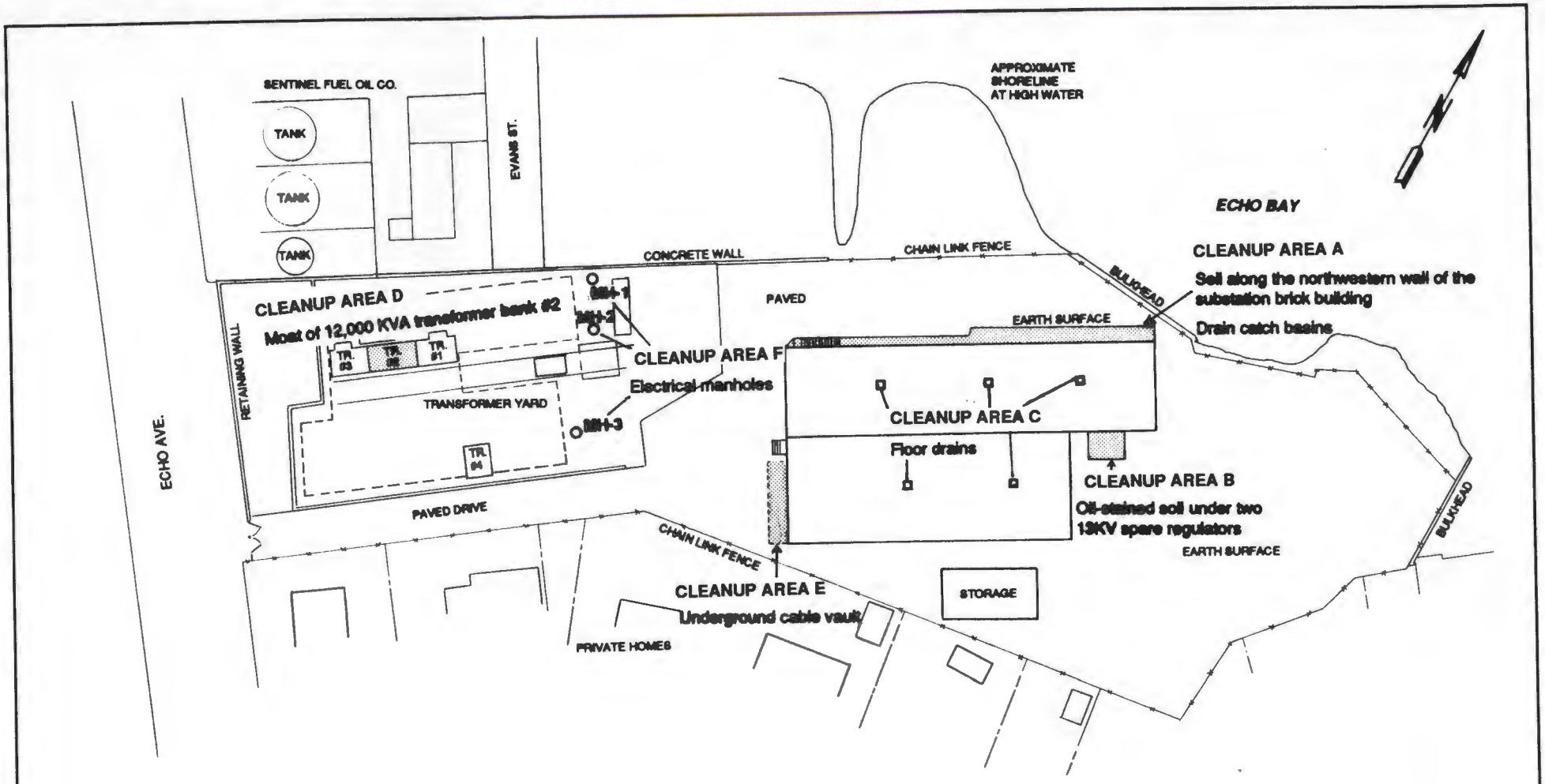


FIGURE 4-2

GENERAL LOCATIONS OF 1985 CLEANUP AREAS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 4-2 (Page 1 of 2)

1985 SHALLOW SOIL SAMPLES FROM AREA A

Echo Avenue Site

SAMPLE No.	PCBs (ppm)	EPA CLEANUP LEVEL (ppm)[a]
1	<10	10
2	ND	10
3	<10	10
4	<10	10

ND - Not detected.
[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

TABLE 4-2 (Page 2 of 2)

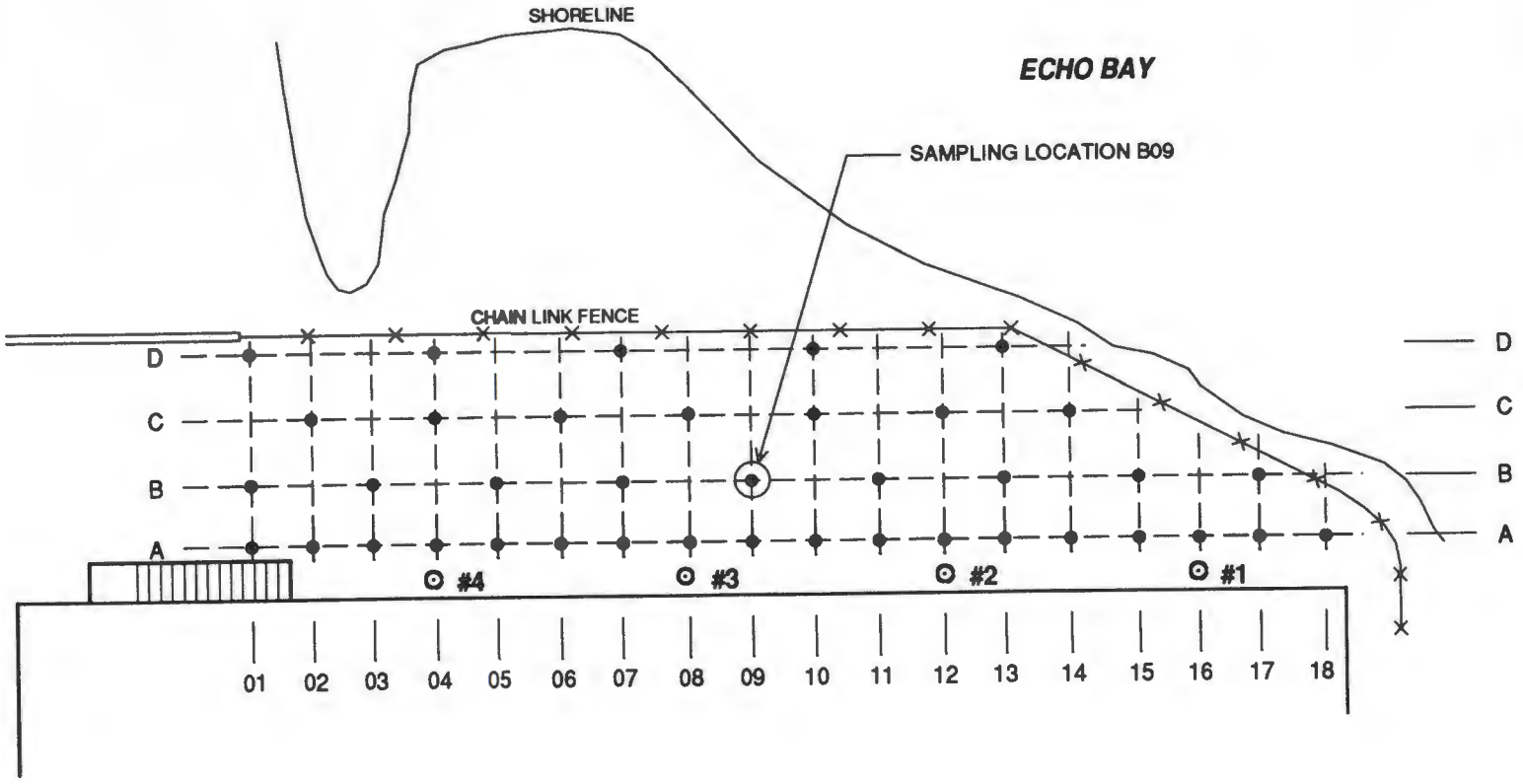
1985 SHALLOW SOIL SAMPLES NEAR AREA A

Echo Avenue Site

SAMPLE No.	PCBs (ppm)	EPA CLEANUP LEVEL (ppm)[a]
A1	ND	10
A2	ND	10
A3	ND	10
A4	ND	10
A5	ND	10
A6	ND	10
A7	ND	10
A8	ND	10
A9	< 10	10
A10	< 10	10
A11	< 10	10
A12	< 10	10
A13	< 10	10
A14	< 10	10
A15	< 10	10
A16	< 10	10
A17	ND	10
A18	ND	10
B1	< 10	10
B3	ND	10
B5	ND	10
B7	< 10	10
B9	< 10	10
B11	ND	10
B13	ND	10
B15	ND	10
B16	ND	10
C2	< 10	10
C4	ND	10
C6	ND	10
C8	ND	10
C10	ND	10
C12	< 10	10
C14	ND	10
D1	< 10	10
D4	ND	10
D7	ND	10
D10	< 10	10
D13	ND	10

ND - Not detected.

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).



LEGEND

- ● Sample location (5 October 1984 sampling grid)
- ⊙ Sample location (sample taken on 12 December 1985)

0 40 ft

SCALE
1 in. = 40 ft

FIGURE 4-3

ECHO AVENUE SUBSTATION
SOIL SAMPLING
AREA A SAMPLING LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

substation building. This oil was removed by using absorbent pads. As described further in this chapter, this cable vault was thoroughly cleaned in 1987.

Cleanup Area F: A thin layer of oil floating on the water surface was observed inside two double manholes MH-1 and MH-3 (Figure 4-4) located in the eastern section of the outdoor transformer yard. The oil was removed from the manholes by using absorbent pads. As described further in this chapter, these manholes were thoroughly cleaned in 1987.

All waste streams generated as a result of the cleanup effort at the site in 1985 were disposed of as a PCB waste in accordance with 40 CFR Part 761.

In addition to the sampling and cleanup described above, Con Edison collected and analyzed for PCBs a number of wipe and shallow soil samples at the site in 1984 and 1985. These included the following:

- Seven wipe samples collected from various oil-stained concrete areas within the outdoor transformer yard (Figure 4-4, Table 4-3). The analytical results for these samples indicated PCB concentrations ranging from less than 0.1 $\mu g/100$ cm^2 to 0.3 $\mu g/100$ cm^2;

- Five wipe samples collected from concrete floors of the compartments in which the five PCB-contaminated feeder regulators used to be installed. In addition, one wipe sample was also collected from the floor of a randomly selected compartment in which a non-PCB feeder regulator used to be installed (Table 4-4);

- Two shallow soil samples collected from the unpaved area located adjacent to and east of the outdoor transformer yard (Figure 4-5, Table 4-5, Sample Nos. D20 and D21);

- Six shallow soil samples collected from unpaved eastern section of the site (Figure 4-6, Table 4-6, Samples E1 and E4 through E8). The analytical results for these six soil samples indicated either non-detectable or less than 10 ppm PCBs.

In April 1986 Energy and Environmental Analysts, Inc. (EEA), who were retained by the New Rochelle Neighborhood Revitalization Corporation, sampled the Echo Avenue site for PCBs. Samples were collected as described in Table 4-7, which also summarizes the analytical results. All solid and liquid samples were split with Con Edison, which analyzed the samples at their laboratory in Astoria, Queens, New York. Wipe samples were also taken by Con

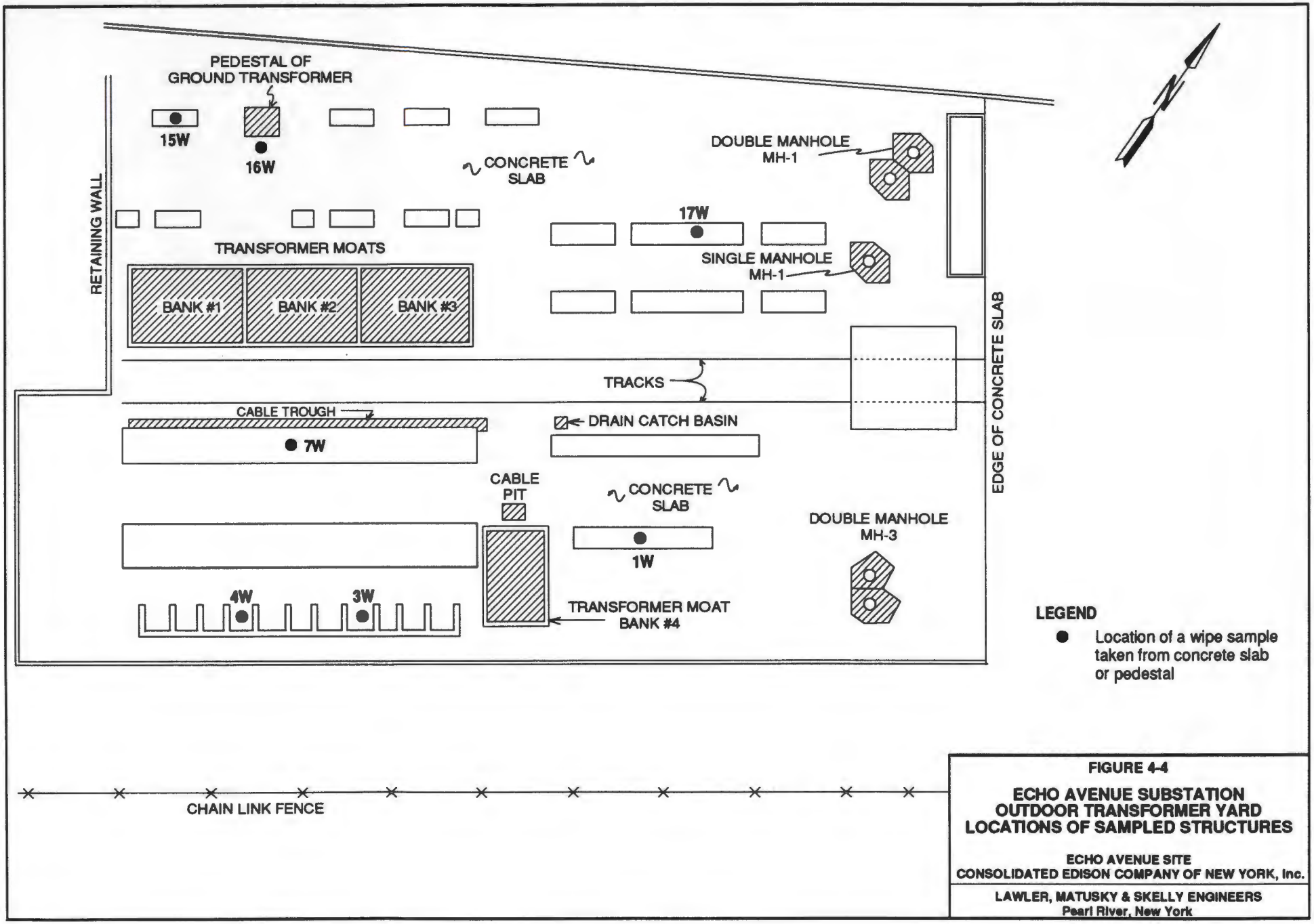


FIGURE 4-4

ECHO AVENUE SUBSTATION
OUTDOOR TRANSFORMER YARD
LOCATIONS OF SAMPLED STRUCTURES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 4-3

1984 WIPE SAMPLES FROM CONCRETE SLAB AND PEDESTALS IN OUTDOOR TRANSFORMER YARD

Echo Avenue Site

SAMPLE No.	PCBs ($\mu g/100\ cm^2$)	EPA CLEANUP LEVEL ($\mu g/100\ cm^2$)[a]
1W	<0.1	10
3W	<0.1	10
4W	<0.1	10
7W	<0.1	10
15W	<0.1	10
16W	0.3	10
17W	<0.1	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

TABLE 4-4

FEEDER VOLTAGE REGULATOR COMPARTMENTS INSIDE SUBSTATION BUILDING

Echo Avenue Site

FEEDER VOLTAGE REGULATOR COMPARTMENTS	SAMPLE No.	PCBs ($\mu g/100\ cm^2$)	EPA CLEANUP LEVEL ($\mu g/100\ cm^2$)[a]
1984 WIPE SAMPLES			
FDR 146 VOLTAGE REGULATOR A0	27W	ND	10
FDR 146 VOLTAGE REGULATOR B0	28W	2.0	10
FDR 146 VOLTAGE REGULATOR C0	29W	1.0	10
FDR 148 VOLTAGE REGULATOR A0	30W	1.0	10
1985 WIPE SAMPLES			
FDR 148 VOLTAGE REGULATOR C0	8	2.0	10
FDR 149 VOLTAGE REGULATOR A0	9	ND	10

ND - Not detected.

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

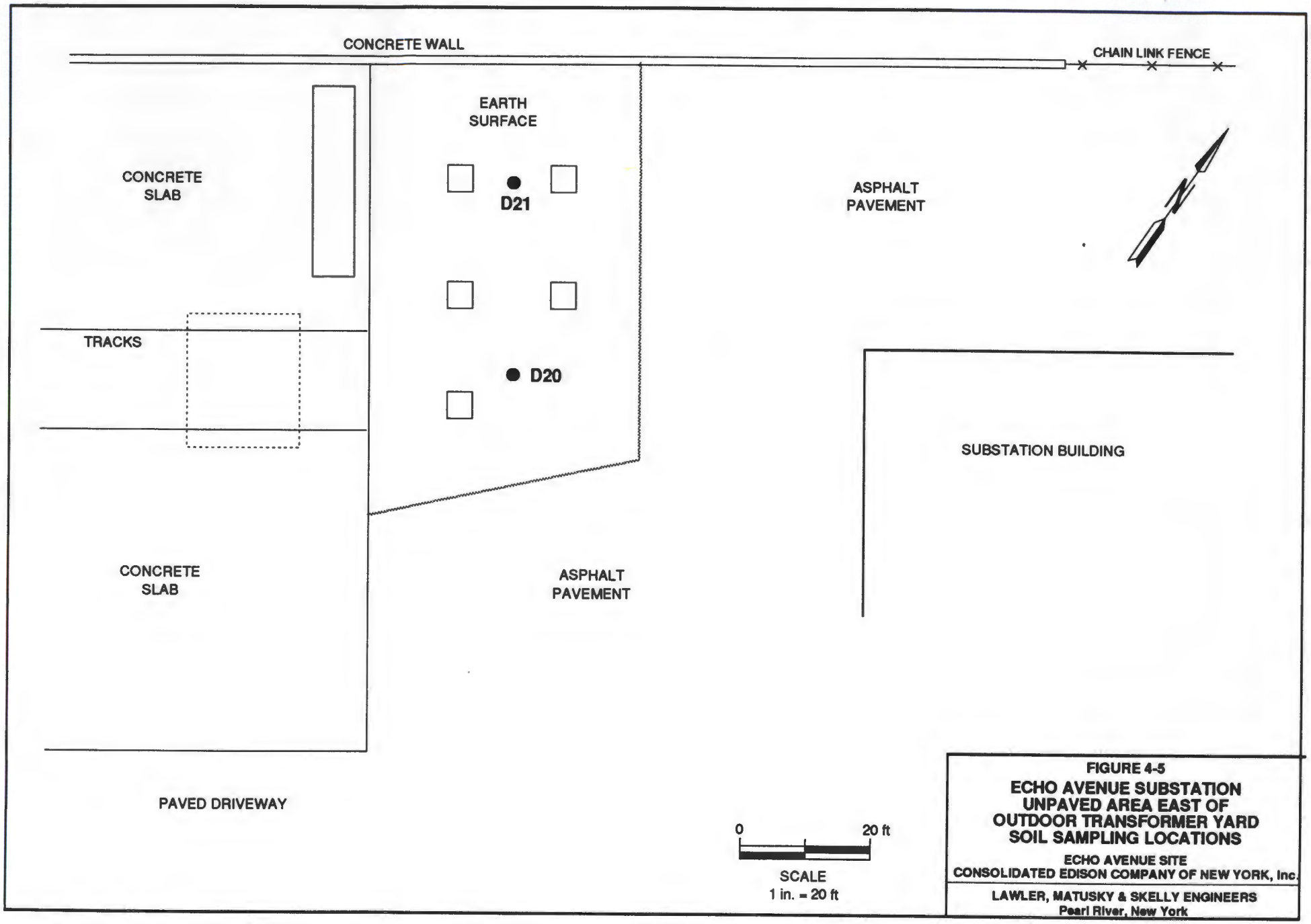


FIGURE 4-5

ECHO AVENUE SUBSTATION
UNPAVED AREA EAST OF
OUTDOOR TRANSFORMER YARD
SOIL SAMPLING LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 4-5

1984 SHALLOW SOIL SAMPLES IN UNPAVED AREA EAST OF OUTDOOR TRANSFORMER YARD

Echo Avenue Site

SAMPLE No.	PCBs (ppm)	EPA CLEANUP LEVEL (ppm)[a]
D20	<10	10
D21	<10	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

TABLE 4-6

1984 SHALLOW SOIL SAMPLES IN UNPAVED EASTERN SECTION OF ECHO AVENUE SITE

SAMPLE No.	PCBs (ppm)	EPA CLEANUP LEVEL (ppm)[a]
E1	< 10	10
E4	< 10	10
E5	ND	10
E6	< 10	10
E7	ND	10
E8	ND	10

ND - Not detected.

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

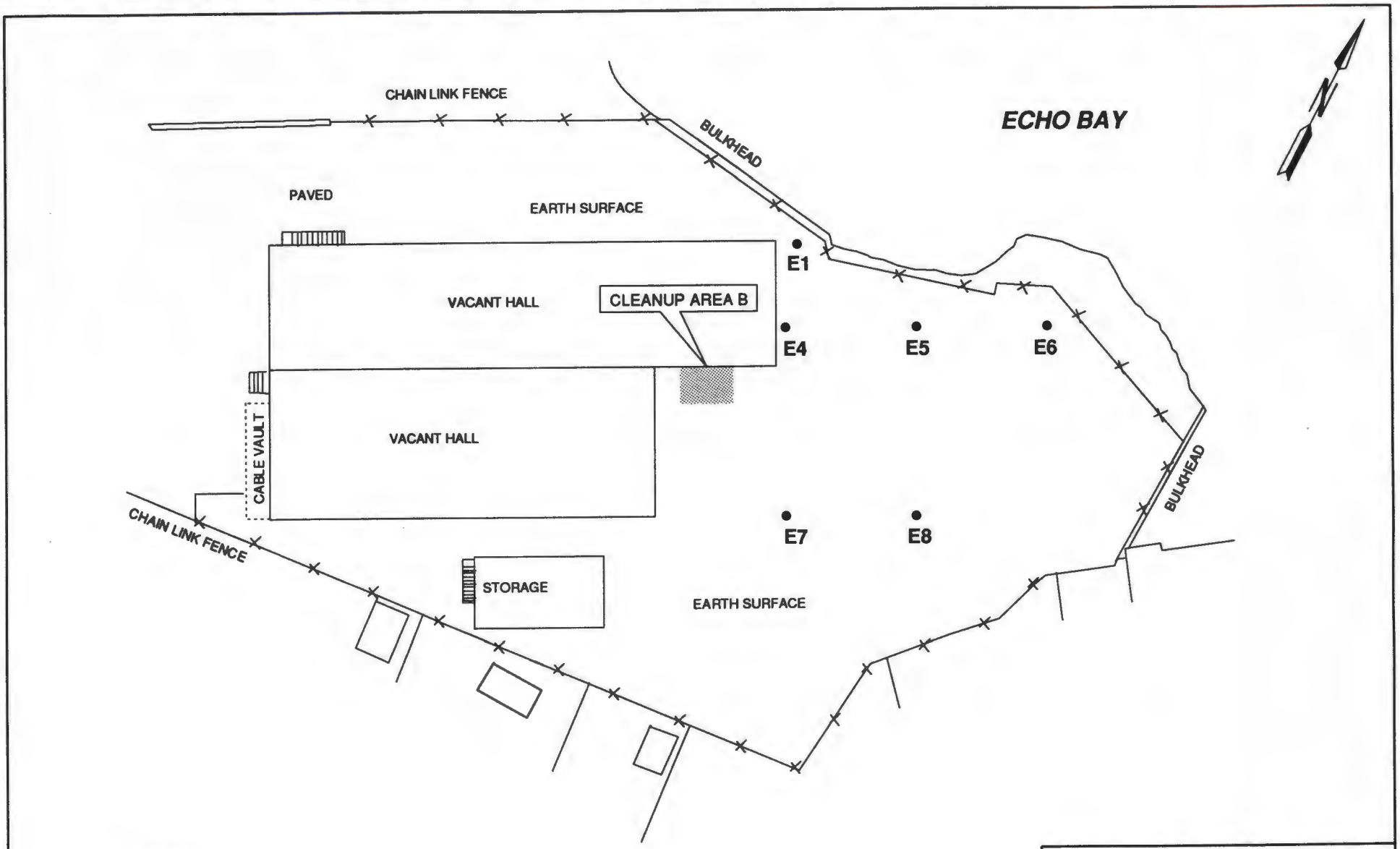


FIGURE 4-6

SOIL SAMPLING IN UNPAVED EASTERN SECTION OF SITE

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 4-7 (Page 1 of 2)

1986 SAMPLING DONE BY EEA

Echo Avenue Site

SAMPLE No.	DESCRIPTION OF SAMPLE	PCBs (ppm)		EPA CLEANUP LEVEL (ppm)[a]
		EEA	CON EDISON	
A-1	Silt deposits from cable pit in front of transformer moat, Bank #4	19.9	< 10	10
A-2	Absorbent material from transformer moat, Bank #4	3.7	< 10	10
A-3	Crushed stone from transformer moat, Bank #4	0.15	< 10	10
A-4	Crushed stone from transformer moat, Bank #3	0.29	14	10
A-5	Crushed stone from transformer moat, Bank #1	28.3	19	10
A-6	Dirt from concrete pad of a ground transformer, Bank #2	65	< 10	10
A-7	Dirt from concrete pavement of the transformer yard near the northern wall	3.7	15	10
A-8	Soil core sample (1' deep) taken through a puncture in the concrete pavement of transformer yard - center, east	4.5	< 10	10
A-9	Dirt from transformer moat, Bank #5	ND	< 10	10
A-10	Dirt/silt from drain, center of transformer yard	18.7	16	10
A-11	Crushed stone from transformer moat, Bank #1	0.06	13	10
A-12	Soil core, north east of Bank #5	---*	< 10	10
B-1	Oil/water from cable trench in the western section of transformer yard, western end of the trench	8.1	11	10
B-2	The same as above, eastern end of the trench	11.4	16	10
B-3	The same as B-2	9.9	16	10
B-4	Water from a pit near Bank #5	0.3	< 10	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

TABLE 4-7 (Page 2 of 2)

1986 SAMPLING DONE BY EEA

Echo Avenue Site

SAMPLE No.	DESCRIPTION OF SAMPLE	PCBs (ppm) EEA	PCBs (ppm) CON EDISON	EPA CLEANUP LEVEL (ppm)[a]
B-5	Water containing oil scum from cable vault in front of the building	0.23	< 10	10
B-6	Water from electrical service box in front of the building	ND	< 10	10
B-7	Water from western drain in the south building	ND	< 10	10
B-8	Water from eastern drain in the south building	ND	< 10	10
B-9	Water from sump in basement	0.02	< 10	10
		PCBs (μg/100 cm^2)		EPA CLEANUP LEVEL (μg/100 cm^2)
C-1	Wipe sample of the floor in the south building near western drain	5	2	10
C-2	Blank sample	ND	< 1	10
C-3	Same as C-1, near eastern drain	9	4	10
C-4	Wipe sample of the floor in the north building, near center drain	4.8	1	10
C-5	Same as C-4, near eastern drain	2.5	2	10
C-6	Wipe sample of floor in the basement, in the center near boiler	47	31	10
C-7	Wipe sample of central wall in the south building	ND	3	10
		PCBs (ppm)		
D-1	Sediment sample, Echo Bay, north of a concrete structure	0.1	< 10	
D-2	Same as D-1, east of the concrete structure	0.19	< 10	

Notes: ND - Not detected
*Sample not analyzed for PCBs by EEA, Inc.
[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

Edison at a position adjacent to those taken by EEA. The results of the analyses conducted by Con Edison are also shown on Table 4-7. Figure 4-7 shows the EEA sample locations.

In August 1987 Con Edison undertook additional cleanup operations. The purposes of the cleanup program were to: cleanup the areas identified by the EEA sampling as having PCBs in concentrations over 10 ppm or 10 $\mu g/100\ cm^2$, extensively sample the site for the presence of PCBs, and, if warranted, undertake additional PCB cleanup to comply with the U.S. Environmental Protection Agency (EPA) PCB Spill Cleanup Policy for residential areas (Ref. 14, Appendix A). These cleanup levels are: <10 mg/kg in soils, gravels, and other similar materials, and <10 $\mu g/100\ cm^2$ for solid surfaces in residential (unrestricted access) areas. The policy requires that substations being transferred to nonutility uses be cleaned to the standards prescribed for residential areas. The following paragraphs (taken from Appendix A of the February 1988 Con Edison report) describe the cleanup operations performed:

"(a) Silt in a Concrete Cable Pit Located Adjacent to the Bank No. 4 Transformer Moat (Figure 4-8)

The silt was removed, and the concrete surfaces of the pit were double pressure washed using Penetone Power Wash 155. The two wipe samples taken from the washed concrete surfaces indicated less than 1 $\mu g/100\ cm^2$ PCBs (Table 4-8, Sample Nos. CP1 and CP2).

(b) Crushed Stone Fill in the Bank No. 3 Transformer Moat (Figure 4-8)

Crushed stone was removed, and the concrete surfaces of the moat were double pressure washed. The three wipe samples taken from the washed concrete surfaces indicated less than 1 $\mu g/100\ cm^2$ (Table 4-8, Sample Nos. 07, 08, and 09).

(c) Crushed Stone Fill in the Bank No. 1 Transformer Moat (Figure 4-8)

Crushed stone was removed and the concrete surfaces of the moat were double pressure washed. Three samples taken from the washed concrete surfaces indicated less than 1 $\mu g/100\ cm^2$ PCBs (Table 4-8, Sample Nos. 10, 11, and 12).

(d) Dirt on Concrete Pedestal of Ground Transformer in Bank No. 2 (Figure 4-8)

Dirt was removed from the transformer pad, and the concrete was double pressure washed. The two wipe samples taken from the washed concrete

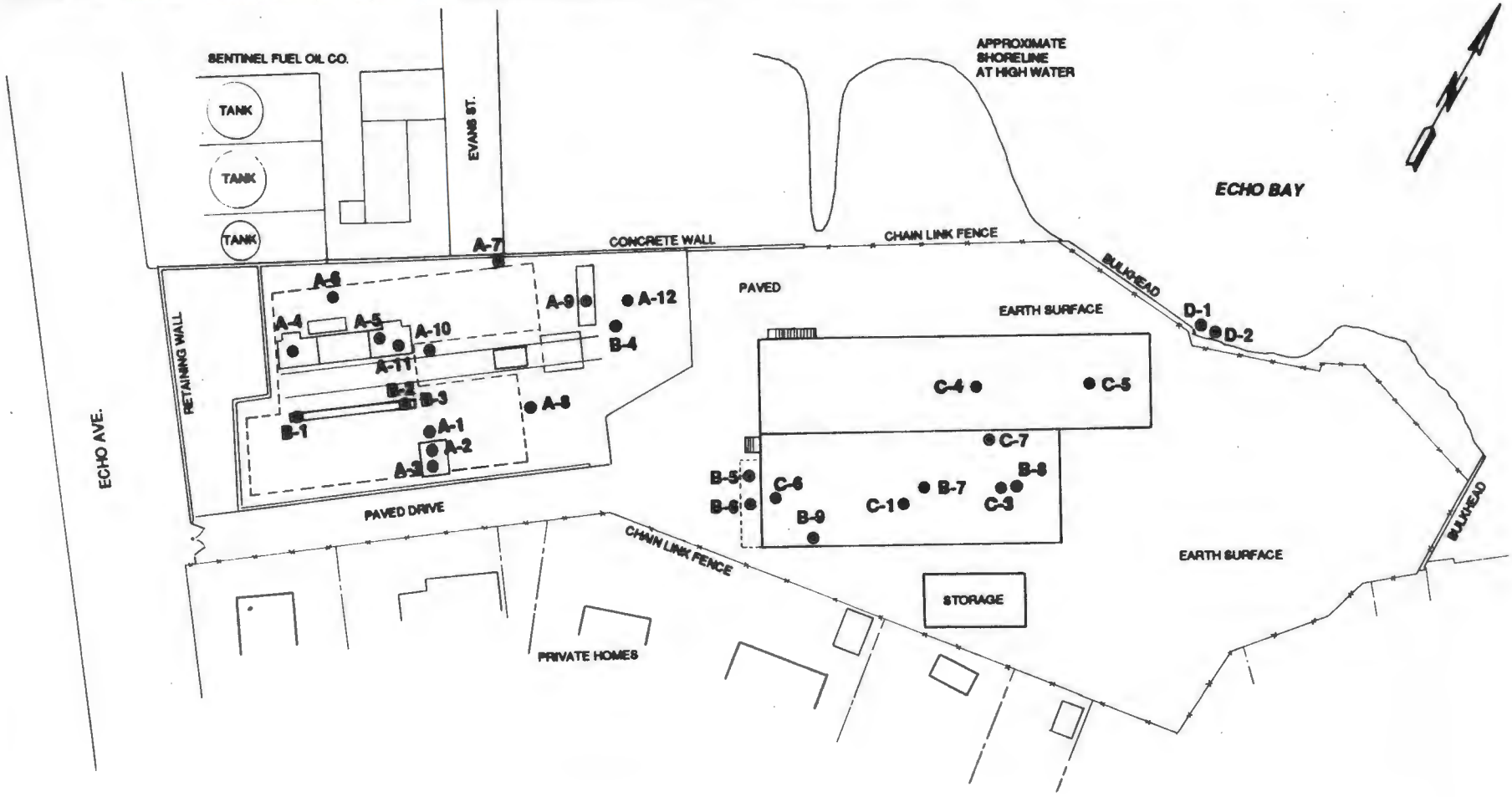


FIGURE 4-7

EEA SAMPLING LOCATIONS
4 APRIL 1986

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

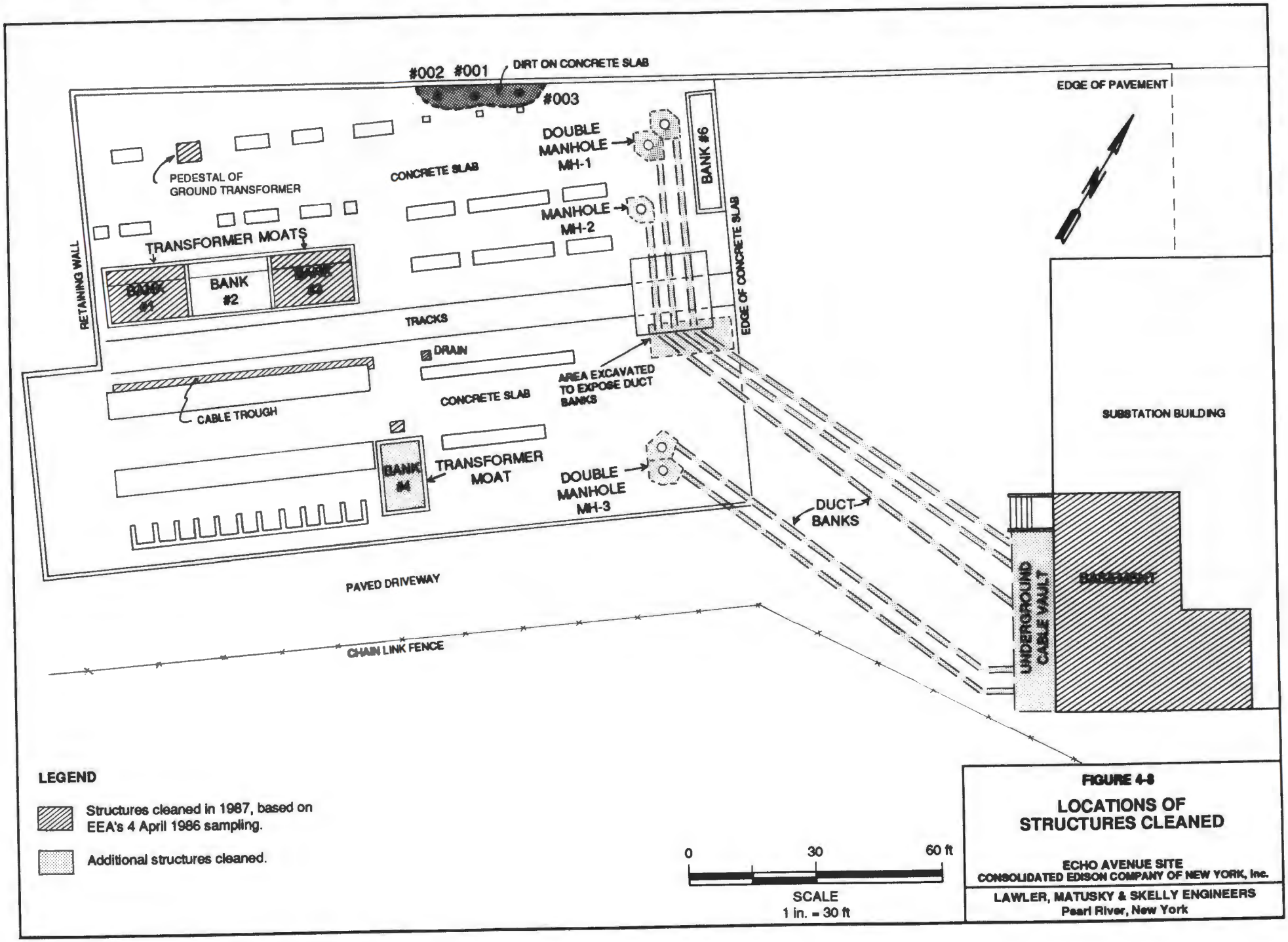

#002
#001
DIRT ON CONCRETE SLAB
#003
EDGE OF PAVEMENT
DOUBLE MANHOLE MH-1
BANK #6
PEDESTAL OF GROUND TRANSFORMER
CONCRETE SLAB
MANHOLE MH-2
TRANSFORMER MOATS
RETAINING WALL
BANK #1
BANK #2
BANK #3
EDGE OF CONCRETE SLAB
TRACKS
DRAIN
AREA EXCAVATED TO EXPOSE DUCT BANKS
CABLE TROUGH
CONCRETE SLAB
SUBSTATION BUILDING
BANK #4
TRANSFORMER MOAT
DOUBLE MANHOLE MH-3
DUCT BANKS
UNDERGROUND CABLE VAULT
BASEMENT
PAVED DRIVEWAY
CHAIN LINK FENCE
LEGEND
Structures cleaned in 1987, based on EEA's 4 April 1986 sampling.
Additional structures cleaned.
0
30
60 ft
SCALE
1 in. = 30 ft
FIGURE 4-8
LOCATIONS OF STRUCTURES CLEANED
ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.
LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 4-8 (Page 1 of 3)

1987 POSTCLEANUP SAMPLING RESULTS OF STRUCTURES LOCATED WITHIN OUTDOOR TRANSFORMER YARD

Echo Avenue Site

SAMPLE LOCATION	SAMPLE No.	PCBs ($\mu g/100\ cm^2$)	EPA CLEANUP LEVEL ($\mu g/100\ cm^2$)[a]
Transformer Moat, Bank #1	10	< 1	10
	11	< 1	10
	12	< 1	10
Transformer Moat, Bank #3	07	< 1	10
	08	< 1	10
	09	< 1	10
Transformer Moat, Bank #4	04	< 1	10
	05	< 1	10
	06	< 1	10
Cable Trough	006	< 1	10
	007	< 1	10
	008	< 1	10
	009	< 1	10
	010	< 1	10
	011	< 1	10
Pedestal of Ground Transformers	004	< 1	10
	005	< 1	10
Drain Catch Basin	13	< 1	10
	14	< 1	10
Cable Pit	CP1	< 1	10
	CP2	< 1	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

TABLE 4-8 (Page 2 of 3)

1987 POSTCLEANUP RESULTS OF STRUCTURES LOCATED WITHIN OUTDOOR TRANSFORMER YARD

Echo Avenue Site

SAMPLE LOCATION	SAMPLE No.	PCBs ($\mu g/100\ cm^2$)	EPA CLEANUP LEVEL ($\mu g/100\ cm^2$)[a]
Double Manhole MH-1	01	< 0.5	10
a. North Chamber	02	< 0.5	10
	03	5.5	10
	04	< 0.5	10
	05	1.1	10
	06	< 0.5	10
	07	< 0.5	10
b. South Chamber	08	0.8	10
	09	< 0.5	10
	010	2.1	10
	011	1.6	10
	012	1.9	10
	013	< 0.5	10
	014	0.6	10
Single Manhole MH-2	15	2.5	10
	16	2.6	10
	17	< 0.5	10
	18	0.5	10
	19	0.6	10
	20	6.6	10
	21	5.1	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

TABLE 4-8 (Page 3 of 3)

1987 POSTCLEANUP RESULTS OF STRUCTURES LOCATED WITHIN OUTDOOR TRANSFORMER YARD

Echo Avenue Site

SAMPLE LOCATION	SAMPLE No.	PCBs (μg/100 cm^2)	EPA CLEANUP LEVEL (μg/100 cm^2)[a]
Double Manhole MH-3			
a. North Chamber	22	< 0.5	10
	23	< 0.5	10
	24	1.2	10
	25	7.1	10
	26	< 0.5	10
	27	< 0.5	10
	28	< 1.5	10
b. South Chamber	29	4.3	10
	30	< 0.5	10
	31	< 0.5	10
	32	< 0.5	10
	33	0.8	10
	34	< 0.5	10
	35	< 0.5	10
Concrete Slab and Pedestals	001	< 1	10
	002	< 1	10
	003	< 1	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

indicated less than 1 µg/100 cm^2 PCBs (Table 4-8, Sample Nos. 004 and 005).

(e) Dirt on Concrete Slab Next to Northern Wall of Outdoor Transformer Yard (Figure 4-8)

Dirt was removed, and the exposed concrete slab was double pressure washed. The three wipe samples taken from the washed section of the concrete slab indicated less than 1 µg/100 cm^2 PCBs (Table 4-8, Sample Nos. 001, 002, and 003).

(f) Dirt/Silt in Drain Located in Outdoor Transformer Yard, East of Bank No. 3 Transformer Moat (Figure 4-8)

Dirt and silt were removed from the drain, and the brick surfaces of the drain were double washed. The two wipe samples taken from the washed brick surfaces indicated less than 1 µg/100 cm^2 (Table 4-8, Sample Nos. 13 and 14).

(g) Oil in Concrete Cable Trough Located in Outdoor Transformer Yard (Figure 4-8)

Oil and water were removed from the trough, and the concrete surfaces of the trough were double pressure washed. The six wipe samples taken from the washed concrete surfaces indicated less than 1 µg/100 cm^2 PCBs (Table 4-8, Sample Nos. 006 to 011).

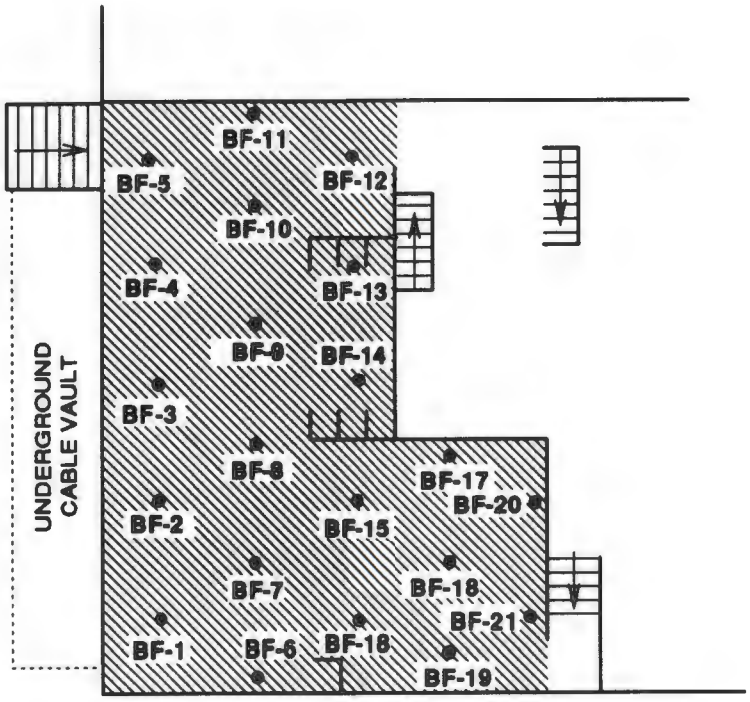
(h) Basement Floor in Substation Building (Figure 4-9)

The concrete floor of the basement was double pressure washed. The twenty-one wipe samples taken from the floor after cleanup indicated less than 1 µg/100 cm^2 (Table 4-9, Figure 4-9, Sample Nos. BF1 to BF 21)."

In addition to the areas described above, Con Edison cleaned several other structures located within the Echo Avenue site in 1987 (Figure 4-8). Those structures were as follows:

"(i) Bank No. 4 Transformer Moat

Although samples of crushed stone fill and absorbent materials from this moat indicated less than 10 ppm, the moat previously contained a PCB-contaminated transformer; thus, in accordance with 40 CFR Part 761 PCB regulations under the Toxic Substances Control Act, the material from this moat would be considered PCB waste. Therefore, that material was removed, and the concrete surfaces of the moat were double pressure washed. The three wipe samples taken from the washed surface indicated



0 20 ft

SCALE
1 in. = 20 ft

FIGURE 4-9

ECHO AVENUE
SUBSTATION BUILDING
BASEMENT FLOOR SAMPLING GRID

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 4-9 (Page 1 of 2)

1987 POSTCLEANUP SAMPLING RESULTS OF BUILDINGS

Echo Avenue Site

SAMPLE LOCATION	SAMPLE No.	PCBs ($\mu g/100\ cm^2$)	EPA CLEANUP LEVEL ($\mu g/100\ cm^2$)[a]
Substation Building Concrete Floor of Basement	BF1	< 1	10
	BF2	< 1	10
	BF3	< 1	10
	BF4	< 1	10
	BF5	< 1	10
	BF6	< 1	10
	BF7	< 1	10
	BF8	< 1	10
	BF9	< 1	10
	BF10	< 1	10
	BF11	< 1	10
	BF12	< 1	10
	BF13	< 1	10
	BF14	< 1	10
	BF15	< 1	10
	BF16	< 1	10
	BF17	< 1	10
	BF18	< 1	10
	BF19	< 1	10
	BF20	< 1	10
	BF21	< 1	10
Office/storage building interior	R1F1	< 1	10
	R1W1	< 1	10
	R2F2	< 1	10
	R2W2	< 1	10
	R3W3	< 1	10
	R3F3	< 1	10
	R4F4	< 1	10
	R4W4	< 1	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

TABLE 4-9 (Page 2 of 2)

1987 POSTCLEANUP SAMPLING RESULTS OF BUILDINGS

Echo Avenue Site

SAMPLE LOCATION	SAMPLE No.	PCBs ($\mu g/100\ cm^2$)	EPA CLEANUP LEVEL ($\mu g/100\ cm^2$)[a]
Interior surfaces of underground cable vault	V-36	4.6	10
	V-37	3.8	10
	V-38	4.1	10
	V-39	3.6	10
	V-40	2.5	10
	V-41	5.4	10
	V-42	1.4	10
	V-43	1.3	10
	V-44	3.4	10
	V-45	3.3	10
	V-46	4.1	10
	V-47	6.6	10
	V-51	6.3	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

less than 1 $\mu g/100\ cm^2$ residual PCBs (Table 4-8, Sample Nos. 04, 05 and 06).

(j) Electrical Manholes MH-1, MH-2 and MH-3 Located in Outdoor Transformer Yard

During the cleanup activities undertaken at the site in August 1987, an oil sheen was observed on water contained in these manholes. The five water samples taken from these manholes indicated less than 1 ppb PCBs.

The sheen was absorbed by absorbent pads; water was pumped out, and the sludge found on the bottom of these manholes was removed. The interior concrete surfaces of the manholes were double pressure washed. The thirty-five wipe samples (seven from each manhole chamber) collected from the washed concrete surfaces indicated residual PCB levels ranging from 0.5 $\mu g/100\ cm^2$ to 6.6 $\mu g/100\ cm^2$ (Table 4-8, Sample Nos. 01 to 35).

(k) Underground Cable Vault located in Front of Substation Building

An oil sheen and oily scum was observed on water contained in this concrete vault. An oil scum and water sample collected by EEA from the water surface inside this vault on 4 April 1986 was determined by EEA to contain 0.23 ppm PCBs (Table 4-7, Sample No. B-5).

The procedures for cleanup of this vault were essentially the same as those described for the manholes [(j) above]. After the cleanup was completed, twenty-one wipe samples were taken from the vault interior surfaces. The measured surficial residual PCB levels varied from 1.3 $\mu g/100\ cm^2$ to 6.6 $\mu g/100\ cm^2$ (Table 4-9, Sample Nos. V36 through V47 and V51).

(l) Cable Duct Banks Connecting Manholes and Cable Vault

The three manholes described in (j) above are connected via five cable duct banks with the underground cable vault [(k) above]. Each of the duct banks contains twelve 4-in. diameter ducts enclosed in a concrete block. The cleanup procedures involved the following:

- A nylon rope was inserted into a duct.
- A stiff brush was attached to one end of the rope and another rope to the brush.
- The brush was pulled once through the duct to remove any sludge contained inside the duct. A water and Penetone

Power Cleaner 155 mixture was then poured into the duct and the brush was moved back and forth to clean the duct.

- Finally, a ball of absorbent pad was attached to one end of the rope and pulled through the duct. This procedure was repeated until the ball came out clean.

Fifty-eight out of the sixty ducts were cleaned using these procedures. The remaining two ducts, located within the duct bank connecting Manhole MH-2 with the cable vaults, were obstructed near the bend of the bank (Figure 4-8). Because of the possibility of a breakage of the concrete block encasing these ducts, the ground near the expected breakage was opened, and the duct bank exposed. No breakage was observed. The three soil samples taken from the bottom (approximately 6 feet below the surface) of this excavation pit indicated less than 1 ppm PCBs. (See sample Nos. E1, E2, and E3 in Table 4-14 presented further in this chapter.)

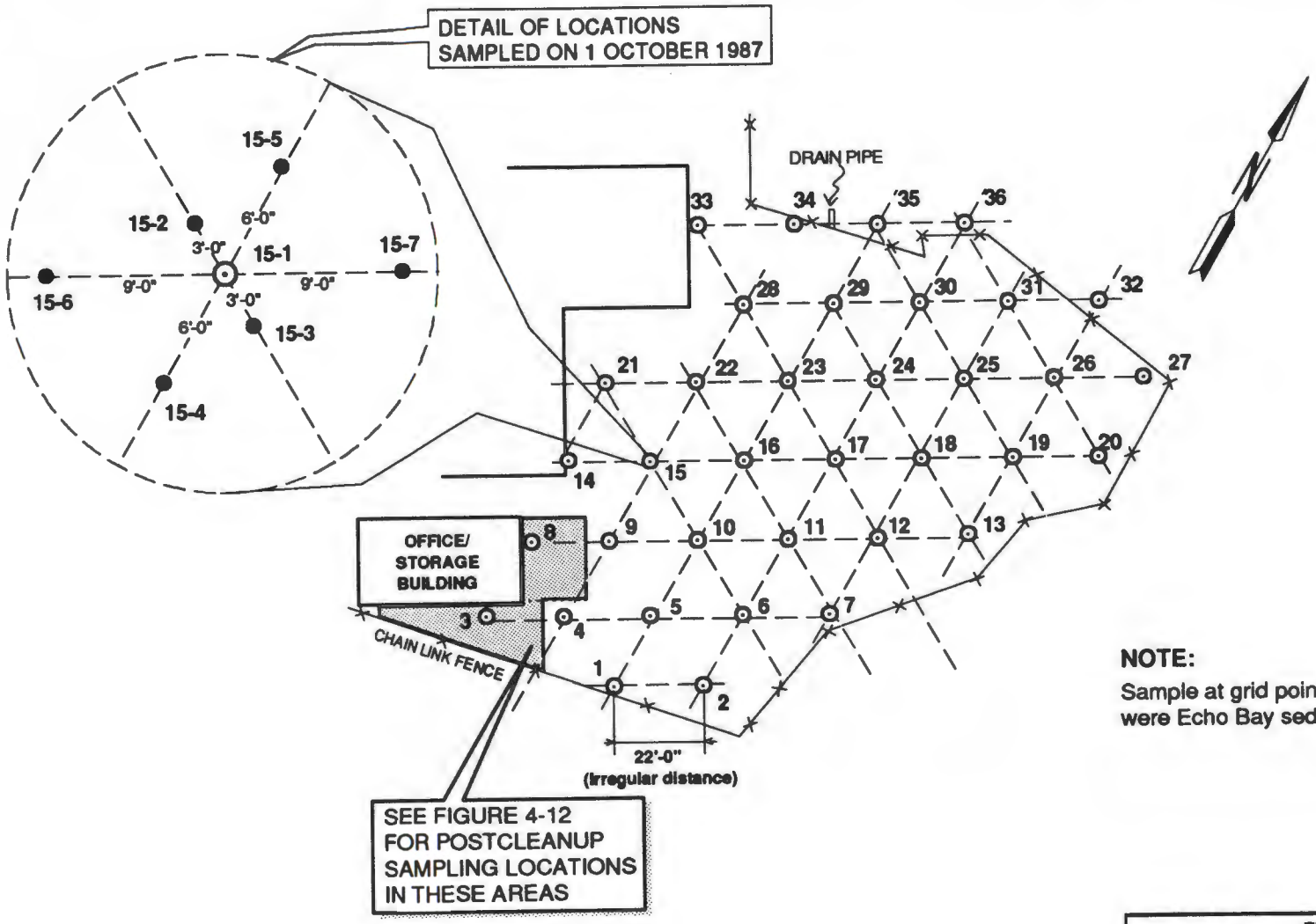
During the 1987 cleanup effort, Con Edison collected and analyzed for PCBs shallow soil samples in the eastern section of the site. The sampling grid is shown on Figure 4-10, and the corresponding analytical data are presented in Table 4-10. A total of 33 soil samples were collected; three of these samples (Grid Point Nos. 3, 8, and 15) exceeded the 10 ppm cleanup level. Soil from the areas surrounding these three sampling locations was removed (Figure 4-11), and the areas were extensively re-sampled to confirm that the 10 ppm cleanup level was achieved. The cleanup effort and post-cleanup sampling in these areas are described below:

Grid Sampling Point No. 15

Approximately 2 in. of soil from a 7 ft-diameter circular area centered at Grid Point No. 15 had to be removed. After removal of the soil, seven soil samples were collected (insert to Figure 4-10) to verify cleanup completion. The seven samples indicated either non-detectable or less than 1 ppm residual PCBs (Table 4-11, Sample Nos. 15-1 to 15-7). The area was then restored to the original grade.

Grid Sampling Point No. 8

Approximately 2.5 ft of fill material contained in the area within concrete footings of a storage shed that was demolished sometime in the past had to be removed. After the excavation was completed, a total of thirteen samples (Figure 4-12, sample location Nos. CS-1 through CS-13) of soil from the bottom of the excavated area were collected to verify the cleanup completion. The samples indicated residual PCB levels ranging



NOTE:

Sample at grid point Nos. 32, 35, and 36 were Echo Bay sediment samples

0 20 ft

SCALE
1 in. = 20 ft

FIGURE 4-10

UNPAVED EASTERN SECTION AREA SOIL SAMPLING LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 4-10

1987 SHALLOW SOIL SAMPLING IN SITE'S EASTERN SECTION

Echo Avenue Site

SAMPLE No.	PCBs (ppm)	SAMPLE No.	PCBS (ppm)	EPA CLEANUP LEVEL (ppm)[a]
1	< 1	19	< 1	10
2	< 1	20	< 1	10
4	3.1	21	< 1	10
5	< 1	22	< 1	10
6	< 1	23	< 1	10
7	< 1	24	< 1	10
9	< 1	25	< 1	10
10	< 1	26	< 1	10
11	< 1	27	< 1	10
12	< 1	28	< 1	10
13	< 1	29	< 1	10
14	< 1	30	< 1	10
16	< 1	31	< 1	10
17	< 1	33	< 1	10
18	< 1	34	< 1	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

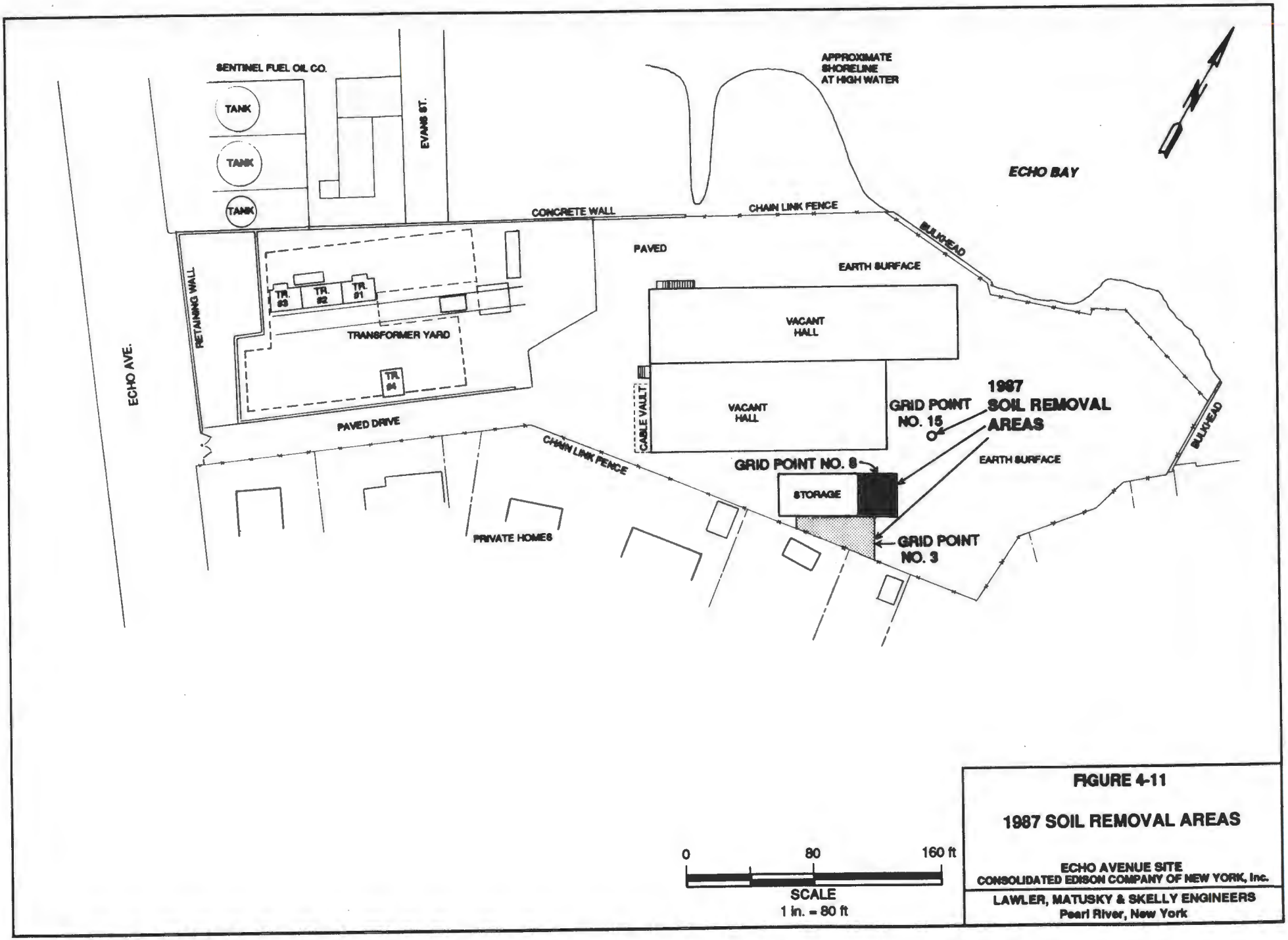


FIGURE 4-11

1987 SOIL REMOVAL AREAS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 4-11

1987 POSTCLEANUP SHALLOW SOIL SAMPLING IN AREA SURROUNDING GRID POINTING No. 15

Echo Avenue Site

SAMPLE No.	PCBs (ppm)	EPA CLEANUP LEVEL (ppm)[a]
15-1	ND	10
15-2	<1	10
15-3	ND	10
15-4	ND	10
15-5	<1	10
15-6	ND	10
15-7	ND	10

ND - Not detected.
[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

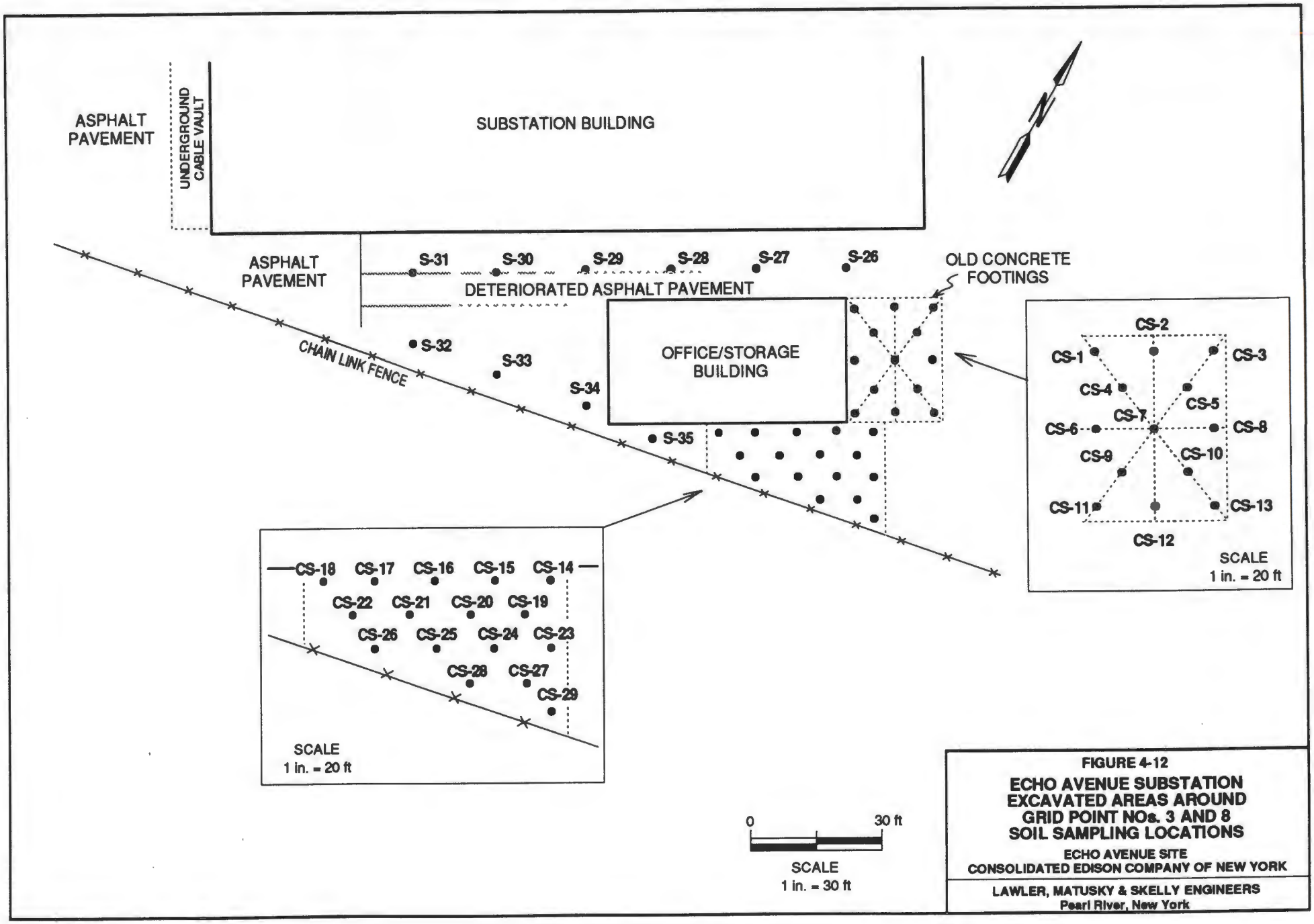


FIGURE 4-12

ECHO AVENUE SUBSTATION
EXCAVATED AREAS AROUND
GRID POINT NOs. 3 AND 8
SOIL SAMPLING LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

from less than 1 ppm to 7 ppm PCBs (Table 4-12, sample Nos. CS-1 to CS-13). The excavated area has not been backfilled.

Grid Sampling Point No. 3

Fill material was removed from a trapezoidal area located southeast of the small office/storage building. The depth of the excavation ranged from 1.5 ft to 3.0 ft, depending on the depth where a clay layer was found. A total of fifteen samples (Figure 4-12, sample location Nos. CS-14 through CS-29) were obtained from this area to verify the cleanup completion. The samples indicated residual PCB levels ranging between less than 1 ppm and 7 ppm (Table 4-12, Samples Nos. CS-14 to CS-29). The excavated area has not been backfilled.

An additional 10 shallow soil samples were collected around the small office/storage building (Figure 4-12, sampling locations S-26 through S-35). The PCB analysis of these samples indicated PCB concentrations ranging between less than 1 ppm and 2.3 ppm (Table 4-13).

In addition to the shallow soil sampling described above, Con Edison also collected deep soil samples at eight boring locations (Figure 4-13, boring locations B-1 through B-8) and from two test pits (Figure 4-13, location Nos. P-1 and P-2). The PCB analysis of these soil samples indicated either non-detectable or less than 1 ppm PCBs (Table 4-14).

Furthermore, five groundwater monitoring wells were installed at the locations depicted in Figure 4-14. The water level observations in these wells indicated that the water levels in monitoring wells MW-1, MW-4, and MW-5 were strongly influenced by the tidal variations in the Echo Bay water level. The levels in monitoring wells MW-2 and MW-3 revealed no variations during the Echo Bay tidal cycle. One groundwater sample was collected from each of wells MW-2 and MW-3, and three groundwater samples were collected from each of wells MW-1, MW-4, and MW-5. The samples from the latter three wells were collected during the falling tide to monitor groundwater moving from the site towards Echo Bay. The collected groundwater samples were analyzed for PCBs and indicated non-detectable PCBs at the detection level of 1.0 µg/l (Table 4-15).

Finally, five Echo Bay sediment samples were collected in 1987 to supplement the two sediment samples collected during the EEA sampling in April 1986. Three of these five

TABLE 4-12

1987 POSTCLEANUP SHALLOW SOIL SAMPLING FROM EXCAVATED AREAS SURROUNDING GRID POINT Nos. 3 AND 8

Echo Avenue Site

SAMPLE No.	PCBs (ppm)	SAMPLE No.	PCBs (ppm)	EPA CLEANUP LEVEL (ppm)[a]
CS-1	<1	CS-15	<1	10
CS-2	<1	CS-16	2	10
CS-3	5	CS-17	<1	10
CS-4	2	CS-18	4.3	10
CS-5	<1	CS-19	<1	10
CS-6	<1	CS-20	7	10
CS-7	<1	CS-21	<1	10
CS-8	<1	CS-22	<1	10
CS-9	<1	CS-23	<1	10
CS-10	1	CS-24	3	10
CS-11	3	CS-25	1	10
CS-12	<1	CS-26	<1	10
CS-13	7	CS-27	2	10
CS-14	6	CS-28	2	10
		CS-29	<1	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

TABLE 4-13

1987 SHALLOW SOIL SAMPLING AROUND OFFICE/STORAGE BUILDING

Echo Avenue Site

SAMPLE No.	PCBs (ppm)	EPA CLEANUP LEVEL (ppm)[a]
S-26	< 1	10
S-27	< 1	10
S-28	< 1	10
S-29	2.3	10
S-30	1.2	10
S-31	1.3	10
S-32	< 1	10
S-33	< 1	10
S-34	< 1	10
S-35	2.1	10

[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

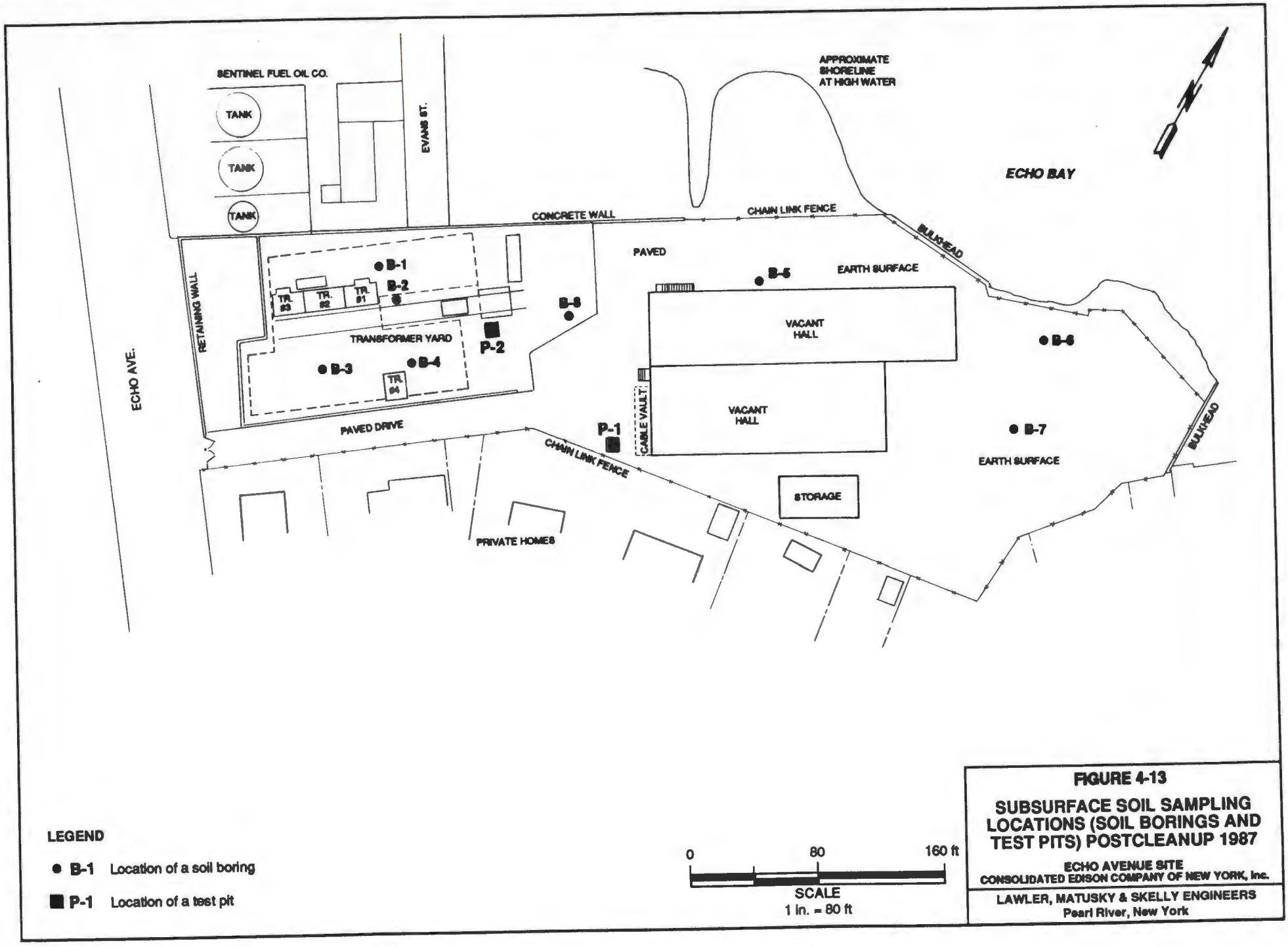


FIGURE 4-13

SUBSURFACE SOIL SAMPLING LOCATIONS (SOIL BORINGS AND TEST PITS) POSTCLEANUP 1987

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 4-14

1987 POSTCLEANUP SUBSURFACE SOIL SAMPLING RESULTS

Echo Avenue Site

	SAMPLE No.	DEPTH (ft)	PCBs (ppm)	EPA CLEANUP LEVEL (ppm)[a]
Boring No. B-1	1	0-2	< 1	10
	2	2-4	< 1	10
	3	4-6	< 1	10
Boring No. B-2	1	1-3	< 1	10
	2	3-5	< 1	10
	3	5-6.8	< 1	10
Boring No. B-3	1	0.5-2.5	< 1	10
	2	2.5-3.9	< 1	10
Boring No. B-4	1	0.5-2.5	< 1	10
	2	2.5-4.5	< 1	10
	3	4.5-6.5	< 1	10
Boring No. B-5	1	0-2	< 1	10
	2	2-4	< 1	10
Boring No. B-6	1	0-2	< 1	10
	2	2-4	< 1	10
	3	4-6	1	10
Boring No. B-7	1	0-2	< 1	10
	2	2-4	< 1	10
	3	4-6	< 1	10
	4	4-8	< 1	10
	5	8-10	< 1	10
	6	10-12	< 1	10
Boring No. B-8	1	0-2	< 1	10
	2	2-4	< 1	10
	3	4-6	< 1	10
	4	6-8	< 1	10
	5	8-9.6		
Test Pit No. P-1	1	7 (approx.)	ND	10
Test Pit No. P-2	E1	6 (approx.)	< 1	10
	E2	6 (approx.)	< 1	10
	E3	6 (approx.)	< 1	10

ND - Not detected.
[a]Cleanup level is for total PCBs (Ref. 14, Appendix A).

TABLE 4-15

1987 POSTCLEANUP GROUNDWATER SAMPLING

Echo Avenue Site

MONITORING WELL No.	SAMPLE No.	PCBs (µg/l)
MW-1	5	<1
	9	<1
	12	<1
MW-2	1	<1
MW-3	2	<1
MW-4	3	<1
	7	<1
	10	<1
MW-5	4	<1
	8	<1
	11	<1

samples were collected from a depth of 0 - 3 in. at grid points Nos. 32, 35, and 36 shown in Figure 4-10. The other two sediment samples were collected from depth intervals of 0 - 3 in. and 9 - 12 in. at sampling location B depicted in Figure 4-14. PCB analysis of these five sediment samples indicated less than 1 ppm PCBs (Table 4-16).

In summary, all 1987 postcleanup samples analyzed had concentrations less than the PCB cleanup standards. Wipe samples from structures within the outdoor transformer yard and the buildings after cleanup all had PCB concentrations of less than 10 µg/100 cm^2. Postexcavation soil samples had PCB concentrations less than 10 mg/kg, and all sediment samples from Echo Bay indicated less than 1 ppm PCBs. The groundwater sampled from the on-site wells showed no detectable PCBs at a detection limit of 1 ppb (µg/l). Because the groundwater standard for PCBs is 0.1 µg/l, the detection level for the groundwater samples analyzed was too high to determine whether the PCB levels were actually below the groundwater standard.

4.2 SITE TOPOGRAPHY

Topographically, the highest ground surface on the site is located along the western edge of the property adjacent to Echo Avenue. The ground surface east of the transformer yard is substantially lower, possibly due to site leveling. The transformer yard is flat and is 2 to 3 ft higher than the remainder of the property, which is also relatively flat. A driveway that enters the site from the west property line drops steeply as it travels eastward. The entire grounds west of the substation buildings are paved with asphalt except for the transformer yard, which is mostly covered with gravel, ash, and debris. The steeply sloping area west of the transformer yard is bare soil.

East of the substation building the ground surface is flat and covered with grass. Some potholes, sinkholes, and cobbles are evident at the surface. The northern and eastern edges of the site terminate along Echo Bay. The soil is retained by bulkheads that are partially submerged at high tide. At low tide, the bulkheads are exposed along with the muddy embankments into which they are set.

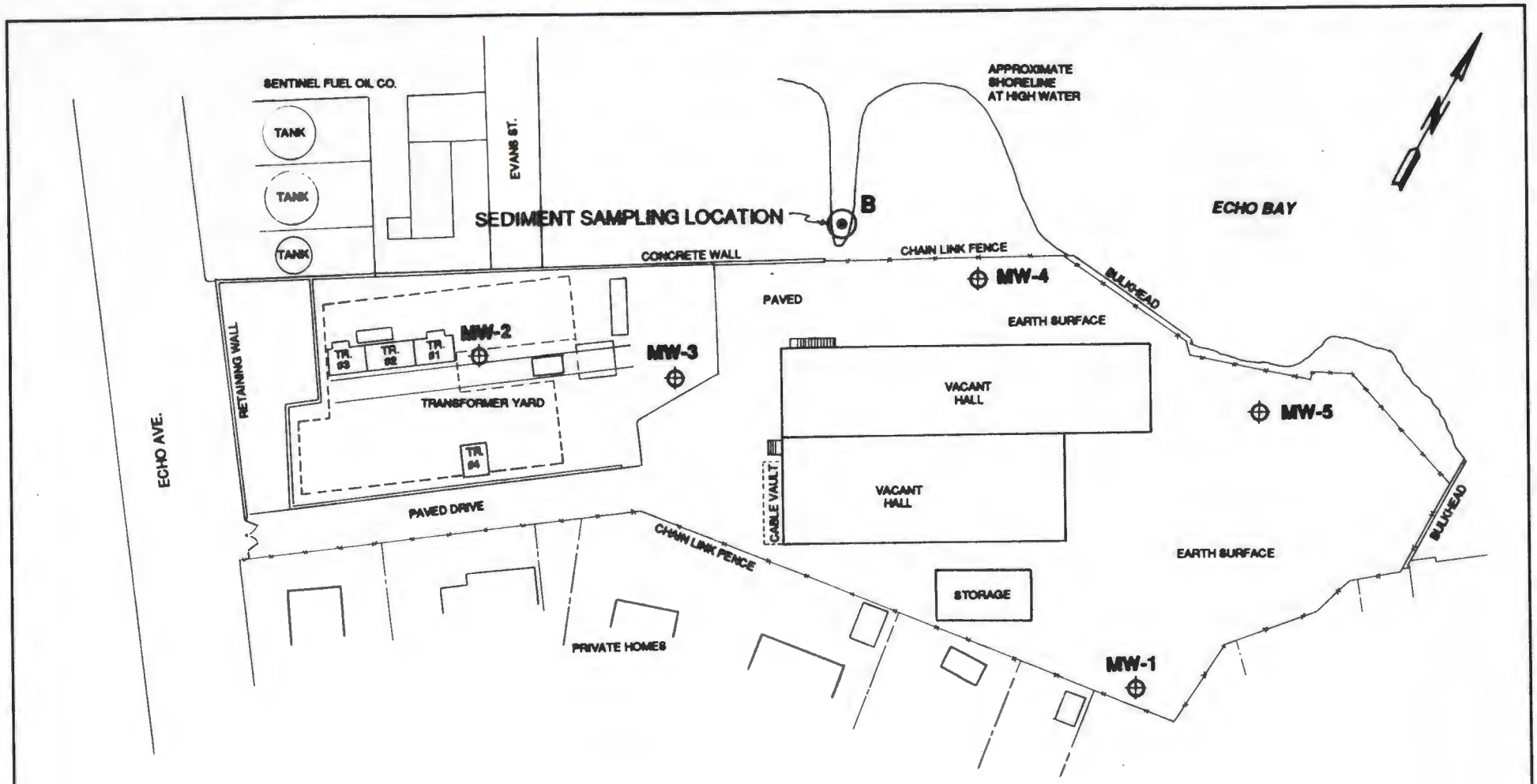


FIGURE 4-14

GROUNDWATER SAMPLING LOCATIONS OF MONITORING WELLS POSTCLEANUP 1987

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

TABLE 4-16

1987 POSTCLEANUP ECHO BAY SEDIMENT SAMPLES

Echo Avenue Site

SAMPLE No.	DEPTH (in.)	PCBs (ppm)
32	0-3	<1
35	0-3	<1
36	0-3	<1
B-1	0-3	<1
B-2	9-12	<1

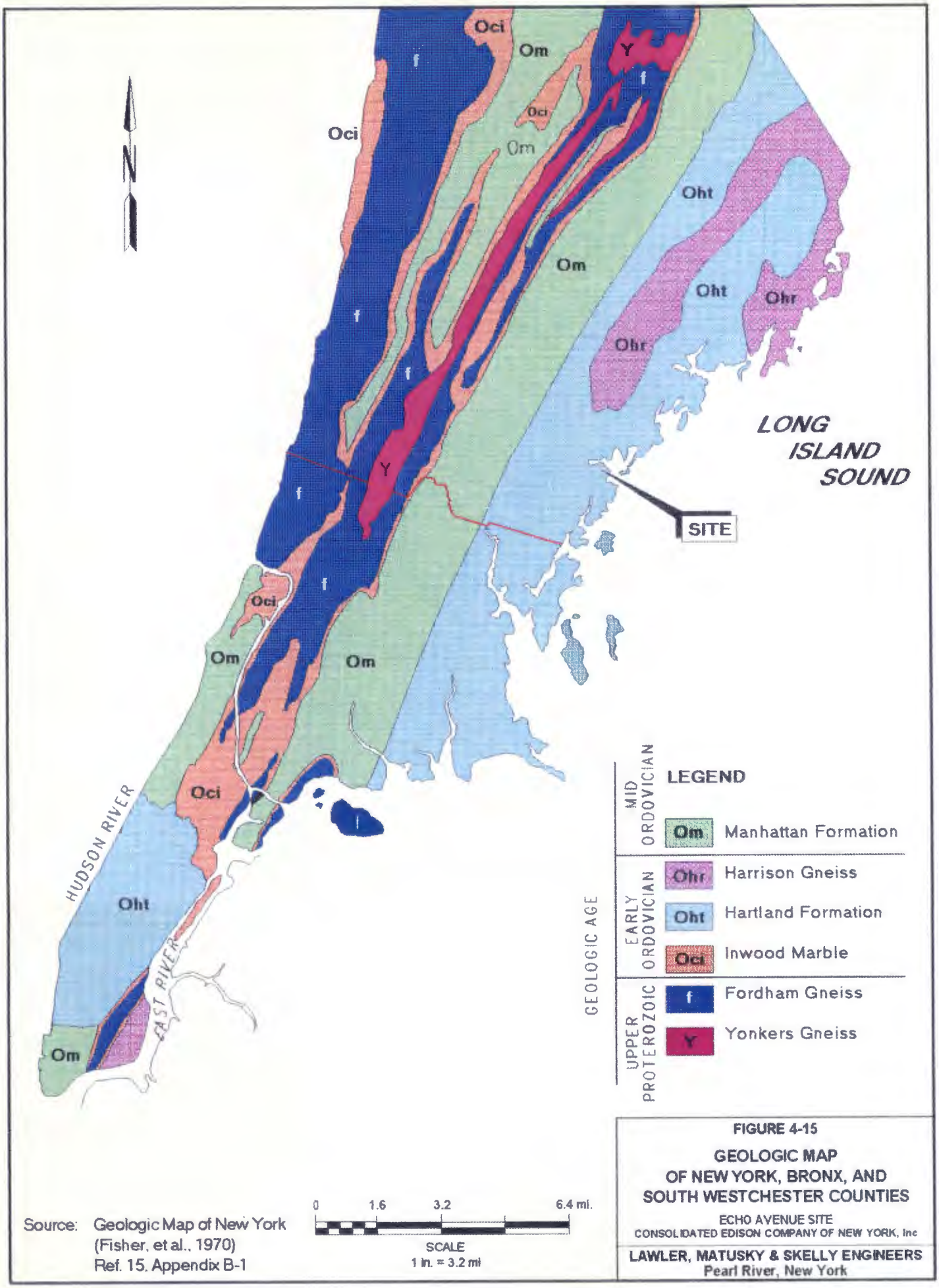
North of the substation the ground surface is flat and paved with asphalt gravel and ash material. South of the storage building the ground surface is flat and grassy. The ground surface between the substation and office/storage building is primarily paved with asphalt gravel.

4.3 GEOLOGY

4.3.1 **Bedrock**

The bedrock underlying the site is identified in published works as biotite garnet schist interbedded with feldspar garnet gneiss. These are moderately high-grade metamorphic rocks formed under great pressure and heat, occurring throughout Manhattan, the Bronx, Westchester, and southeastern Connecticut (see Figure 4-15 from Ref. 15, Appendix A). They are members of the Hartland Formation (Ref. 16, Appendix A), one of a series of parallel, northeast-trending belts of metamorphic rocks formed during the late Cambrian to mid-Ordovician periods (510-460 million years ago). During this period North America and Europe were drifting toward one another and oceanic crust was subducting under North America and northwest Africa. This activated plutonic and volcanic events along the continental margin, forming mountains that predated the Appalachians (Ref. 17, Appendix A). The Hartland Formation is derived primarily from oceanic crust (basalt) and overlying sediment sequences that subducted under and compacted against the North American continent as the European continent drifted closer. Where the two continents merged during the late Paleozoic (roughly 300 million years ago), folded, faulted, and uplifted marginal sedimentary and metamorphic rocks formed the Appalachian Mountains.

Locally, rocks are commonly broken by faults trending northwest (Ref. 18, Appendix A). They originated as thrust faults formed by compaction during continental merging. Later, as the continents began drifting apart (Triassic period, 200 million years ago), the faults were reactivated as tensional planes of movement. Strike-slip faults (lateral displacement) and oblique faults (movement in any direction) were also formed. Local earthquakes (epicenters in Bronx and Westchester counties) still occur today; one of the most recent occurring in 1986 (Ref. 18, Appendix A).



Source: Geologic Map of New York (Fisher, et al., 1970) Ref. 15, Appendix B-1

FIGURE 4-15

GEOLOGIC MAP OF NEW YORK, BRONX, AND SOUTH WESTCHESTER COUNTIES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

The surface of the bedrock underlying the site plunges to the northeast, becoming progressively deeper in this direction and underlying Echo Bay and its sediments (Figures 4-16 and 4-17).

4.3.2 **Unconsolidated Deposits**

Unconsolidated sediments in Westchester County are glacial in origin, emplaced by retreating Pleistocene age ice sheets (11,000 years ago) in the form of till and stratified drift. The glacial material was derived from local bedrock (gneiss, schist, amphibolite, and granite), which was plucked up, pulverized, transported, and redeposited by the overlying ice sheets.

Stratified drift (sorted and layered glacial sediment) is located in the lower-lying areas throughout the county. Originally deposited as till (unsorted, structureless glacial sediment), it was reworked into stratified deposits by running water that concentrated in low-lying areas. Till covers the bedrock at higher elevations and where no glacial material is present, bedrock is exposed. Thickness of the sediment cover varies from 0 to over 100 ft.

The overburden on site varies from approximately 4 to 18 ft in thickness and is composed chiefly of well sorted sand and silt with lesser amounts of clay, gravel, and cobbles (see boring logs [Appendix D] and Figure 4-17). These natural constituents are mixed with black and colorful ash fill in some areas. Depressions resembling sinkholes were observed at two wells (EAMW-4 and EAMW-5). Several additional smaller depressions were also noted about the site.

4.4 **HYDROGEOLOGY**

Hydraulic conductivity is the measurement of the ability of a media to allow passage of a unit of fluid for a unit of time. The measured hydraulic conductivity of glacial sediments varies widely as does the sediment composition. Well-sorted stratified drift may have a conductivity as great as 10^{-1} cm/sec, while fine-grained cohesive till is typically in the range of 10^{-4} to 10^{-6} cm/sec (Ref. 19, Appendix A). Conductivity is ultimately controlled by the permeability of the rock or sediment. Hydraulic conductivity of the overburden on the site varies.

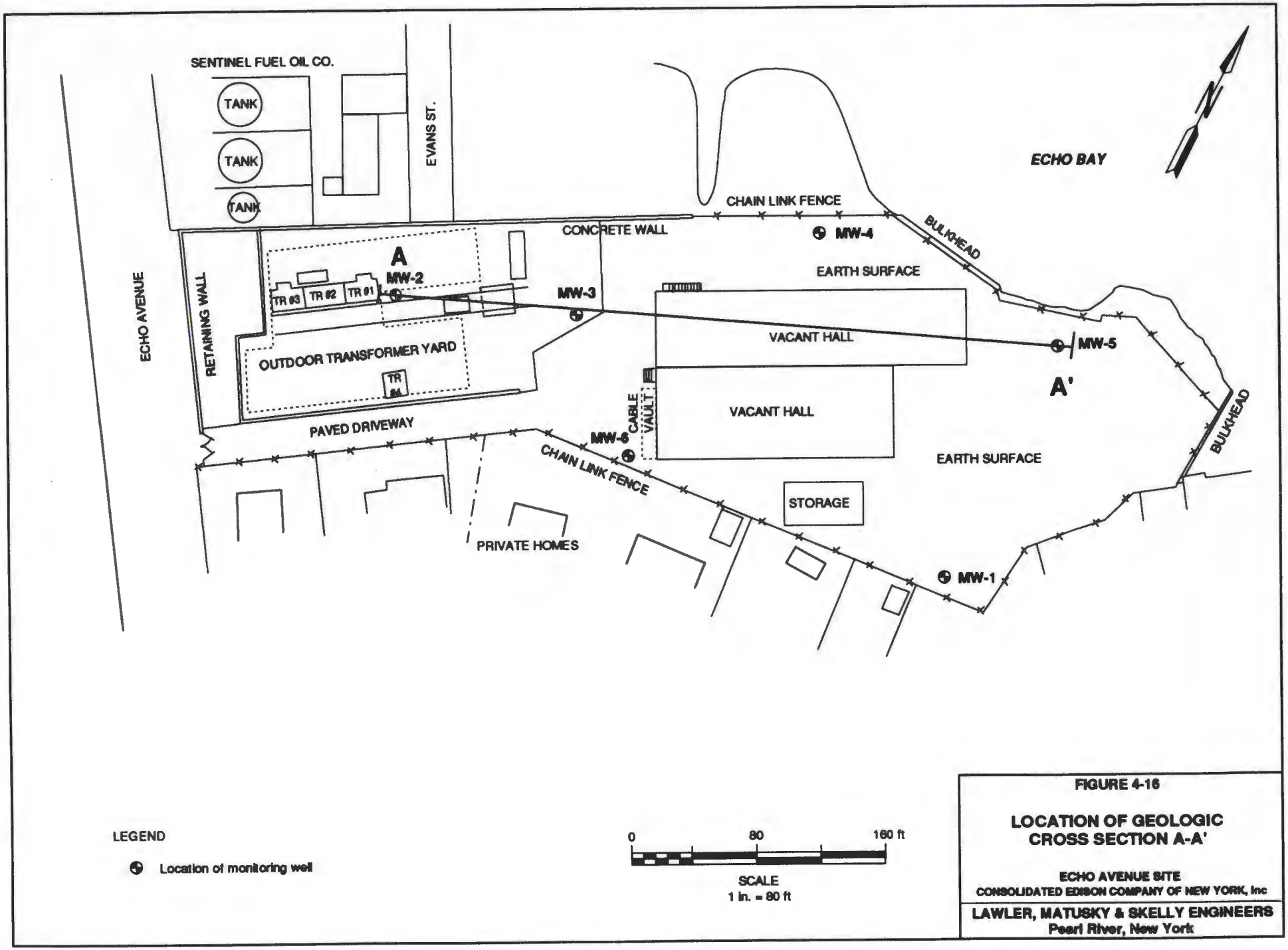


FIGURE 4-16

LOCATION OF GEOLOGIC CROSS SECTION A-A'

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

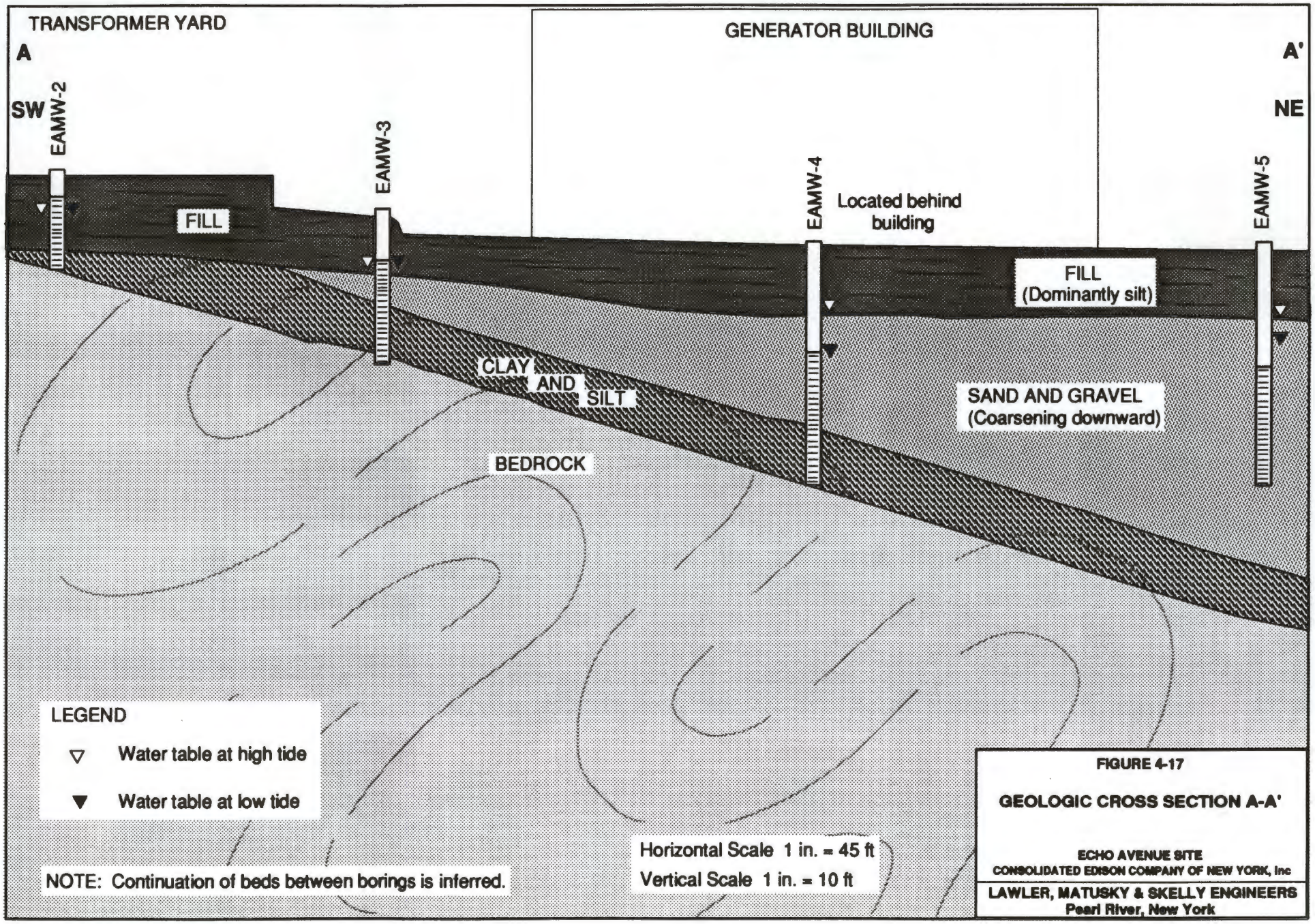


FIGURE 4-17

GEOLOGIC CROSS SECTION A-A'

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

Conductivities increase slightly from the western to eastern end of the site, possibly due to clayey fluctuations at the groundwater level near Echo Bay (Figures 3-2 to 3-5). The continuous cyclic groundwater movement on the eastern portion of the site may have gradually dislodged and removed fine-grained particles (i.e., clay and silt), thereby increasing the permeability of the soils near the bay, or may have aided in developing the sediments much like a well sand pack to allow more efficient movement through the media.

Water in soil may move both horizontally and vertically depending upon head conditions and structure. The well and test borings (Appendix D) revealed sand, silt, and clay stratified into thin beds (laminated texture). This structure allows greater lateral movement while inhibiting vertical movement. Water tends to flow through the permeable sands that are laterally distributed and is blocked by the relatively impermeable clays and silts that are stacked vertically with the sand layers.

Bedrock is found at varying depths beneath the overburden, dipping and becoming progressively deeper toward the northeast and outcropping in the vicinity of the site. Metamorphic rocks generally have extremely low permeabilities. The majority of water occurring in them is found in joints, fractures, and faults. Many metamorphic rocks in Westchester County, including the Hartland Formation, yield large amounts of water (Ref. 20, Appendix A). Most of this water is drawn from of depths at least 100 ft and even 300-400 ft. Bedrock groundwater may be isolated from overburden groundwater unless faults or fractures connecting the two systems are present.

Water enters the site as precipitation and also from throughflow and runoff from higher elevations from the western end of the site. A considerable amount of the runoff and throughflow may have first traveled along Echo Avenue, which borders the western edge of the Con Edison property and is uphill of it. Following the topography and bedrock surface, runoff, throughflow, and infiltrating precipitation move northeast, downslope toward Echo Bay from areas of higher head to lower head (Figures 3-2 to 3-5). The northeast dipping bedrock surface acts as a chute along which groundwater flows northeast into the bay. This groundwater movement is in conformance with the regional flow pattern of eastern Westchester County, where groundwater migrates east toward Long Island Sound.

4.5 PHASE II RESULTS

4.5.1 Site Reconnaissance

LMS personnel and Con Edison personnel conducted a site reconnaissance at the Echo Avenue site. During the site reconnaissance an air monitoring survey was taken with an HNU PI-101 PID to check for evidence of organic vapors at outside sample locations and staging areas and inside the substation building. No readings above background were observed nor were any organic odors detected. Air monitoring data and results of the site inspection are contained in Appendix B. Based on the site reconnaissance, a site specific Health and Safety Plan (HASP) was prepared and is contained in Appendix C. The observations and decisions made during the visit regarding the procedures for sampling and number of samples were incorporated into the work plan.

4.5.2 Test Boring Soil Data

Seven test borings were drilled. One test boring was drilled prior to construction of the new monitoring well (MW-6). Soil samples from the test boring for the new monitoring well were collected from 0-12 ft at 2-ft intervals. In accordance with the work plan, only four of the six samples were analyzed for the target compound list (TCL) organics and target analyte list (TAL) inorganics. Six test borings were drilled in the southeastern area of the property. In addition to a shallow soil sample collected at or near each boring location (the results of which are discussed in Section 4.5.3), three 1-ft samples were collected from each boring and analyzed for PCBs only. The three samples were collected at depths of 1-2, 2-3, and 3-4 ft. The results are shown on Table 4-17 and presented graphically on Figure 4-18. Analytical data reports are contained in Appendix G and the data usability report is in Appendix H.

4.5.2.1 *Volatile Organics*. Methylene chloride (MC) was detected at a concentration of 0.002 mg/kg in two of the samples from test boring EAMW-6 at depths of 0-2 and 4-6 ft. The result was an estimated concentration as it was below the compound quantitation limit. Although not found in the associated trip, field, or method blank, MC is a common laboratory contaminant and its presence may be due to laboratory contamination. Tentatively identified

TABLE 4-17 (Page 1 of 5)

SOIL BORINGS DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAMW-6 (0-2 ft)	RE EAMW-6 (0-2 ft)	DL EAMW-6 (0-2 ft)	EAMW-6 (4-6 ft)	EAMW-6 (8-10 ft)	EAMW-6 (10-12 ft)	FIELD BLANK 4 (mg/l)	RE FIELD BLANK 4 (mg/l)	TRIP BLANK (mg/l)
VOLATILE ORGANICS (mg/kg)									
Methylene chloride	ND	0.002 j	NR	0.002 j	ND	ND	ND	ND	ND
Tentatively Identified Compounds									
Unknown	ND	ND	NR	ND	0.787 (2) j	ND	0.130 j	0.110 j	ND
Pentane, 3-methyl-(8CI9CI)	ND	ND	NR	ND	ND	0.008 j	ND	ND	ND
Cyclobutane, ethyl- (8CI9CI	ND	ND	NR	ND	ND	ND	0.023 j	0.019 j	ND
SEMIVOLATILE ORGANICS (mg/kg)									
Naphthalene	0.820	0.790	0.930 j	ND	ND	ND	ND	NR	NR
2-Methylnaphthalene	1.50	1.00	1.20 j	ND	ND	ND	ND	NR	NR
Acenaphthylene	4.00 e	3.90 e	6.50	ND	ND	ND	ND	NR	NR
Acenaphthene	0.250 j	0.270 j	0.320 j	ND	ND	ND	ND	NR	NR
Dibenzofuran	0.510	0.780	0.830 j	ND	ND	ND	ND	NR	NR
Fluorene	0.900	1.10	2.00	ND	ND	ND	ND	NR	NR
Phenanthrene	1.70	0.630	1.60 j	ND	ND	ND	ND	NR	NR
Anthracene	8.80 e	2.90 e	3.30	ND	ND	ND	ND	NR	NR
Carbazole	0.190 j	0.100 j	0.250 j	ND	ND	ND	ND	NR	NR

( ) - Number of compounds in total.
e - Estimated concentration; exceeds GC/MS calibration range.
j - Estimated concentration; compound present below quantitation limit.
DL - Diluted sample analysis; see Appendix G for dilution factor.

ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Not run.
RE - Re-analysis.

SOIL BORINGS DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAMW-6 (0-2 ft)	RE EAMW-6 (0-2 ft)	DL EAMW-6 (0-2 ft)	EAMW-6 (4-6 ft)	EAMW-6 (8-10 ft)	EAMW-6 (10-12 ft)	FIELD BLANK 4 (mg/l)
SEMIVOLATILE ORGANICS (mg/kg)							
Fluoranthene	2.90	1.20	3.40	ND	ND	ND	ND
Pyrene	2.70	2.30	2.40	ND	ND	ND	ND
Benzo(a)anthracene	4.00 e	2.90	4.50	ND	ND	ND	ND
Chrysene	4.90 e	4.80 e	4.80	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	0.380	0.340 j	0.420 j	0.190 j	0.098 j	0.056 j	0.005 j b
Benzo(b)fluoranthene	2.30	2.40	2.80	ND	ND	ND	ND
Benzo(k)fluoranthene	2.10	1.80	4.00	ND	ND	ND	ND
Benzo(a)pyrene	0.640	0.620	0.80 j	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	0.460	0.560	0.520 j	ND	ND	ND	ND
Dibenzo(a,h)anthracene	0.620	1.10	0.570	ND	ND	ND	ND
Tentatively Identified Compounds							
Unknown	4.90 (15) j	4.23 (10) j	4.03 (3) j	0.164 (2) j	0.220 j	0.095 j	ND
Aliphatic hydrocarbon	ND	0.290 j	9.72 (7) j	ND	ND	ND	ND
Ethyldimethylbenzene isomer	ND	0.160 j	ND	ND	ND	ND	ND
Naphthalene, 1-methyl-	ND	1.86 (3) j	1.20 j	ND	ND	ND	ND
Ethenyldimethylbenzene isome	0.390 j	ND	ND	ND	ND	ND	ND
Benzene, 1,3-butadienyl-	0.140 j	0.150 j	ND	ND	ND	ND	ND
Cycloprop[alidene, 1,1a,6,6	0.390 j	ND	ND	ND	ND	ND	ND

( ) - Number of compounds in total.
b - Found in associated blanks.
e - Estimated concentration; exceeds GC/MS calibration range.
j - Estimated concentration; compound present below quantitation limit.
DL - Diluted sample analysis; see Appendix G for dilution factor.

ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Not run.
RE - Re-analysis.

SOIL BORINGS DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAMW-6 (0-2 ft)	RE EAMW-6 (0-2 ft)	DL EAMW-6 (0-2 ft)	EAMW-6 (4-6 ft)	EAMW-6 (8-10 ft)	EAMW-6 (10-12 ft)	FIELD BLANK 4 (mg/l)
SEMIVOLATILE ORGANICS (mg/kg)							
Tentatively Identified Compounds							
Azulene	ND	ND	1.00 j	ND	ND	ND	ND
Methylbutenylbenzene isomer	0.250 j	ND	ND	ND	ND	ND	ND
Tetrahydromethylnaphthalene	0.250 j	ND	ND	ND	ND	ND	ND
Benzene, 1-butynyl-	ND	0.380 j	ND	ND	ND	ND	ND
1,4-Ethenonaphthalene, 1,4-d	ND	0.380 j	0.530 j	ND	ND	ND	ND
Naphthalene, 2-ethenyl-	ND	1.30 j	2.00 j	ND	ND	ND	ND
Methylbuphenyl isomer	ND	ND	0.970 (2) j	ND	ND	ND	ND
9H-Fluorene-9-carboxylic aci	ND	ND	1.70 j	ND	ND	ND	ND
1H-Phenalene	ND	ND	0.950 j	ND	ND	ND	ND
Methylfluorene isomer	ND	ND	0.370 j	ND	ND	ND	ND
Unknown PNA	ND	ND	0.370 j	ND	ND	ND	ND
Butanedioic acid, (phenylmet	ND	ND	ND	0.130 j	ND	ND	ND
Diphenylmethylpyridine isome	ND	ND	ND	0.219 (2) j	ND	ND	ND
PESTICIDES/PCBs (mg/kg)							
Aldrin	0.0081 p	NR	NR	ND	ND	ND	ND
Heptachlor Epoxide	0.0085 p	NR	NR	ND	ND	ND	ND
Endosulfan II	0.017	NR	NR	ND	ND	ND	ND
4,4' -DDD	0.0078 p	NR	NR	ND	ND	ND	ND
Endrin ketone	0.0092 p	NR	NR	ND	ND	ND	ND
A-Chlordane	0.0022 p	NR	NR	ND	ND	ND	ND

( ) - Number of compounds in total.
j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB analyte has > 25 % difference for the detected concentrations between the two GC columns.
DL - Diluted sample analysis; see Appendix G for dilution factor.

ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Not run.
RE - Reextracted analysis.

TABLE 4-17 (Page 4 of 5)

SOIL BORINGS DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAMW-6 (0-2 ft)	EAMW-6 (4-6 ft)	EAMW-6 (8-10 ft)	EAMW-6 (10-12 ft)	FIELD BLANK 4 (mg/l)	NATIVE SOIL CONCENTRATIONS TYPICAL RANGE (n)
TAL METALS (mg/kg)						
Aluminum	7,080	18,900	18,900	20,500	0.264	10,000 - 300,000
Antimony	ND	ND	ND	ND	ND	0.6 - 10
Arsenic	4.4	2.3	0.82 B	0.95	ND	1.0 - 40
Barium	81.6	69.8	189	193	0.024 B	100 - 3,500
Beryllium	0.42 B	0.70 B	0.62 B	0.59 B	ND	0.1 - 40
Cadmium	1.4	ND	2.2	1.7	ND	0.01 - 7.0
Calcium	3,750	1,210	1,530	1,220	0.183 B	100 - 400,000
Chromium	12.4	28.1	56.2	52.2	ND	5.0 - 3,000
Cobalt	9.1 B	7.6 B	22.9	17.8	ND	1.0 - 40
Copper	45.7	18.5	30.9	30.3	0.033 B	2.0 - 100
Iron	14,100	20,800	35,600	34,200	0.590	7,000 - 550,000
Lead *	141 +	9.0 SA	5.5	5.2	ND	2.0 - 200
Magnesium	3,060	4,420	8,240	8,520	0.092 B	600 - 6,000
Manganese	128	375	849	686	0.0052 B	100 - 4,000
Mercury **	ND N	ND N	ND N	ND N	ND N	0.01 - 0.08
Nickel	14.9	18.5	40.6	35.0	ND	5.0 - 1,000
Potassium	2,530	2,390	8,460	9,770	0.084 B	400 - 30,000
Selenium	0.60 B	ND W	ND W	ND W	ND	0.1 - 2.0
Silver	ND	ND	ND	0.70 B	ND	0.1 - 5.0
Sodium	408 B	405 B	267 B	259 B	0.251 B	750 - 7,500
Thallium	0.20 B	ND	0.62 B	1.1 B	ND	0.1 - 12
Vanadium	35.2	37.9	63.5	70.2	ND	20 - 500
Zinc	78.0	43.0	73.5	74.0	0.023	10 - 300
Cyanide	ND	ND	ND	ND	ND	-

* - Lead results should be interpreted as estimated as no QC was performed; see validation report (Appendix H) for full discussion.
** - Mercury results are likely biased low as the matrix spike recovered at 30.8 %; actual concentrations may exceed the detection limit.
(n) - Ref. 21, Appendix A.
\+ - Correlation coefficient for the MSA is <0.995.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
N - Spiked sample recovery is not within control limits.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
SA - Value determined by the method of standard addition.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

TABLE 4-17 (Page 5 of 5)

SOIL BORINGS DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EATB-1 (1-2ft)	EATB-1 (2-3ft)	EATB-1 (3-4ft)	EATB-2 (1-2ft)	EATB-2 (2-3ft)	EATB-2 (3-4ft)	EATB-3 (1-2ft)	EATB-3 (2-3ft)	EATB-3 (3-4ft)	EPA CLEAN UP LEVEL^
PCBs (mg/kg)										
Aroclor 1242	ND	ND	ND	0.022 J	ND	ND	ND	ND	ND	10
Aroclor 1260	0.015 j p	ND	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EATB-4 (1-2ft)	EATB-4 (2-3ft)	EATB-4 (3-4ft)	EATB-5 (1-2ft)	EATB-5 (2-3ft)	EATB-5 (3-4ft)	EASESS-11 (1-2ft)	EASESS-11 2-3ft)	EASESS-11 (3-4ft)	EPA CLEAN UP LEVEL^
PCBs (mg/kg)										
Aroclor 1254	0.230	0.070 p	ND	ND	ND	0.092	ND	ND	0.015 j	10
Aroclor 1260	0.110 p	0.036 j p	ND	ND	ND	0.063	ND	ND	ND	10

^ - Reference 14, Appendix A; clean up level is for total PCBs.
e - Estimated concentration; exceeds GC/MS calibration range.
j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB analyte has > 25% difference for the detected concentrations between the two GC columns.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

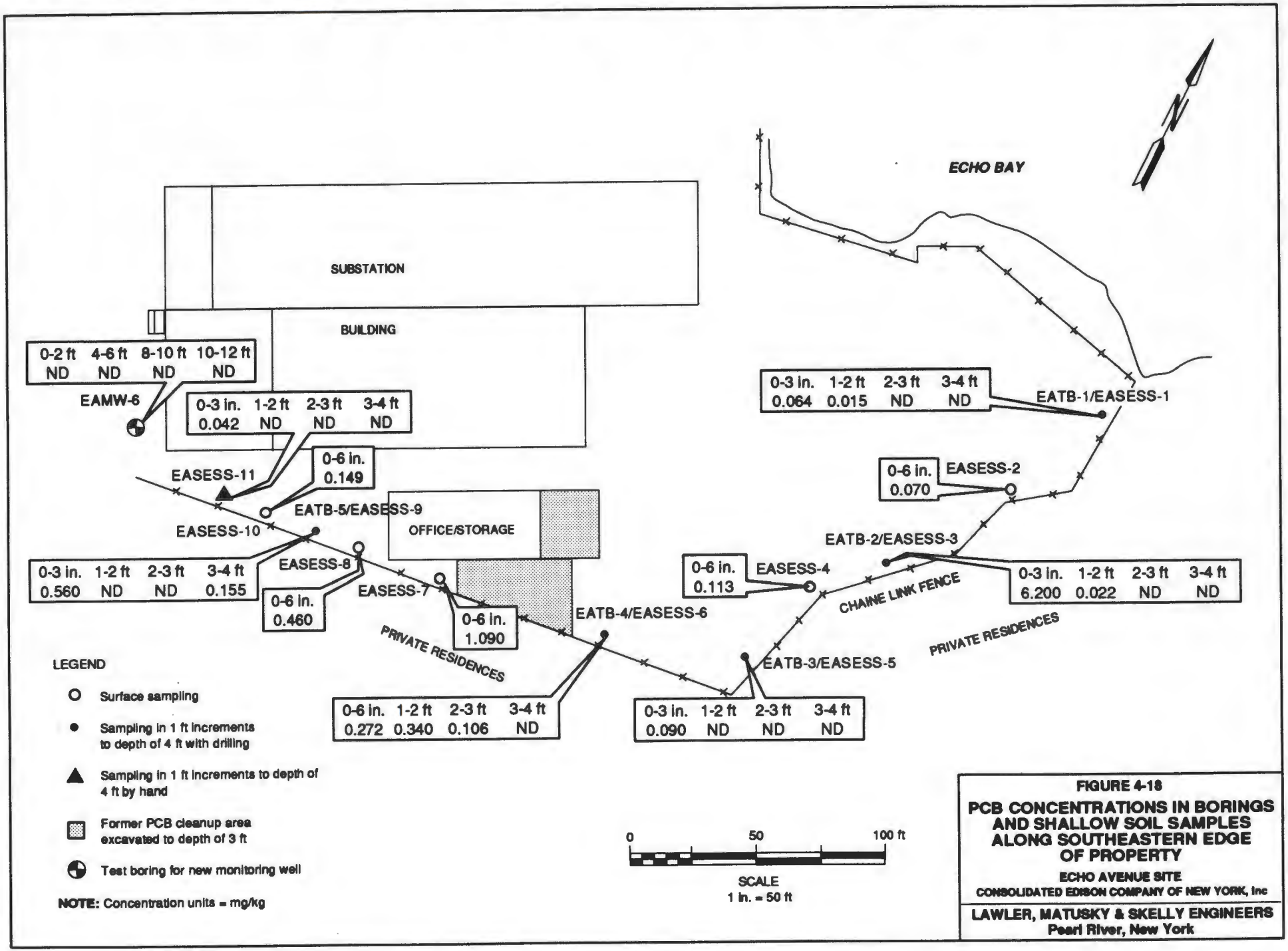


FIGURE 4-18

PCB CONCENTRATIONS IN BORINGS AND SHALLOW SOIL SAMPLES ALONG SOUTHEASTERN EDGE OF PROPERTY

ECHO AVENUE SITE

CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

compounds (TICs), mostly unknown, were found at concentrations of 0.787 and 0.008 mg/kg in the samples from 8-10 and 10-12 ft, respectively.

4.5.2.2 ***Semivolatile Organics.*** Polycyclic aromatic hydrocarbons (PAHs) at a total concentration of 37.510 mg/kg were detected in the 0- to 2-ft sample from the monitoring well test boring that was diluted for analysis (see Appendix G). This sample also contained 0.830 mg/kg of dibenzofuran. PAHs, which are found in conjunction with dibenzofuran, are normally associated with coal tars used for waterproofing materials, pipe coating materials, asphalt, roofing and sealant materials, and insulation. As the test boring was located close to the building, the PAHs may be associated with building materials or asphalt pavement. This sample also had 0.420 mg/kg of bis(2-ethylhexyl)phthalate (B2EHP), a phthalate acid ester (PAE). PAEs are associated with plastics and plasticizers and are commonly found in soils. B2EHP is also a common laboratory contaminant. Naphthalene and 2-methylnaphthalene (2MN) were detected at 0.930 and 1.200 mg/kg, respectively, in this sample. Naphthalene and like substances are associated with diesel fuel. Carbazole was also found at a concentration of 0.250 mg/kg; carbazole is used as dye intermediate; in making photographic plates sensitive to ultraviolet light; and as a reagent for lignin, carbohydrates, and formaldehyde (Ref. 22, Appendix A). The source of the carbazole is unknown. TICs totaling 22.840 mg/kg were also found in this 0- to 2-ft sample.

The soil samples from the 4- to 6-, 8- to 10-, and 10- to 12-ft horizons had only one TCL semivolatile organic compound (SVOC), which was bis(2-ethylhexyl)phthalate, at concentrations of 0.190, 0.098, and 0.056 mg/kg in each of the three samples, respectively. The concentration of B2EHP decreased from the 4- to 6-ft sample to the bottom (10- to 12-ft) sample. Total concentrations of TICs also decreased from the 4- to 6-ft to the bottom soil samples (i.e., 0.513 mg/kg in the 4- to 6-ft sample, to 0.220 mg/kg in the 8- to 10-ft sample, and 0.095 mg/kg in the 10- to 12-ft sample).

4.5.2.3 ***Pesticides/PCBs.*** Pesticides were detected in only the 0- to 2-ft sample in the test boring drilled for the new monitoring well. The pesticides found included aldrin at 0.0081, heptachlor epoxide at 0.0085, endosulfan II at 0.017, 4,4'-DDD at 0.0078, endrin ketone at 0.0092, and alpha-chlordane at 0.0022, all in mg/kg. Most of these pesticides fall into the

general category of broad spectrum insecticides. Based on the age of the building and the location of this test boring, it is probable that insecticides found in the boring had been applied for termite or general insect control. None of the other samples from this test boring had detectable levels of pesticides. PCBs were not found in any of the samples from this test boring.

The results of the PCB analyses of the other six test boring locations are also summarized on Table 4-17. Test borings EATB-1, -2, -4, and -5 were drilled by a rig, whereas test boring EATB-3 and EASESS-11 were dug by hand. Test boring EATB-1 had detectable levels of PCBs at the 1- to 2-ft depth (0.015 mg/kg), which is significantly below the EPA cleanup level of 10 mg/kg. EATB-2 also had detectable levels (0.022 mg/kg) of PCBs in the 1- to 2-ft depth. The Aroclor detected in EATB-1 was 1260, while the Aroclor detected in EATB-2 was 1242. EATB-3 had no detectable levels of PCBs in any of the soil samples. EATB-4 had 0.340 and 0.106 mg/kg of total PCBs (Aroclors 1254 and 1260) in the 1- to 2-ft and 2- to 3-ft samples, respectively. EATB-5 had no detectable PCBs in the 1- to 2-ft or 2- to 3-ft samples, but did have 0.155 mg/kg (Aroclor 1254) in the 3- to 4-ft sample. EASESS-11 also had no PCBs in the first two subsurface samples but had a trace (0.015 mg/kg) of Aroclor 1254 in the 3- to 4-ft sample. All of these PCB concentrations are well below the EPA cleanup level of 10 mg/kg.

4.5.2.4 ***Metals and Cyanide.*** Metals and cyanide analyses were also conducted on the test boring for the new monitoring well.

With the exception of the 8- to 10-ft and 10- to 12-ft soil sample results for magnesium, none of the metal concentrations were found above the range for native soils (Ref. 21, Appendix A). At these depths the magnesium concentration was only slightly above the native soil concentration range.

The lead detected in the 0- to 2-ft sample may be related to diesel fuel (indications of which were noted at the surface).

Cyanide was not found in any of the soil samples from the test boring.

4.5.3 **Shallow Soil Samples**

A total of 26 shallow soil samples were collected at the Echo Avenue site during the Phase II investigation. Eleven samples (EASESS-1 to -11) were collected along the southeastern edge of the property, six of them at or very near the locations of the test borings. These samples were analyzed for PCBs only. Eight samples (EASWSS-1 through -8) were collected in the southwestern end of the site and analyzed for PCBs only. The samples in these two areas were collected alternately at depths of either 0-3 in. or 0-6 in., as described in Chapter 3. Six samples (EADEC-1 through -6) collected at locations designated by the on-site NYSDEC representative and were all taken from a depth of 0-6 in. Three of these NYSDEC-specified samples were analyzed for all TCL and TAL constituents; the remaining three samples were analyzed for PCBs only. In addition, during the concrete core sample collection, potentially contaminated soil in one of the transformer moats (Number 5) was sampled and analyzed for PCBs only; it was designated as EATM5-SS. All data, including quality assurance (QA) data, are provided on Table 4-18 and summarized on Figures 4-18 to 4-20. The analytical data reports and usability report are contained in Appendices G and H, respectively.

4.5.3.1 ***Volatile Organics.*** None of the samples analyzed for VOCs had detectable levels nor did they have any detectable TICs.

4.5.3.2 ***Semivolatile Organics.*** Sample EADEC-B was collected near the bulkhead on the eastern end of the property. The sample had 0.340 mg/kg of PAHs and 0.200 mg/kg of PAEs, all of which were estimated concentrations detected below the quantitation limit. TICs in this sample totaled 0.374 mg/kg, and all were individually below the quantitation limit. Sample EADEC-D, taken off the bulkhead on the northern portion of the property near the area where the sediment samples were collected, had concentrations of PAHs totaling 0.230 mg/kg, PAEs totaling 0.250 mg/kg, and naphthalene at 0.130 mg/kg; again all concentrations were below the quantitation limit. The matrix spike (MS) and matrix spike duplicate (MSD) from this sample had 0.140 and 0.061 mg/kg of PAHs, 0.310 and 0.340 mg/kg of PAEs and 0.120 mg/kg of naphthalene (exclusive of pyrene, the spiking compound). TICs in EADEC-D were

TABLE 4-18 (Page 1 of 7)

SHALLOW SOIL SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EADEC-B (0-6 in.)	EADEC-D (0-6 in.)	MS EADEC-D (0-6 in.)	MSD EADEC-D (0-6 in.)	EADEC-E (0-6 in.)	RE EADEC-E (0-6 in.)
VOLATILE ORGANICS (mg/kg)	ND	ND	ND	ND	ND	ND
Tentatively Identified Compounds	ND	ND	NR	NR	ND	ND
SEMIVOLATILE ORGANICS (mg/kg)						
Naphthalene	ND	0.130 j	0.120 j	0.120 j	ND	NR
2-Methylnaphthalene	ND	ND	ND	ND	0.240 j	NR
Phenanthrene	ND	ND	ND	ND	0.660	NR
Anthracene	ND	ND	ND	ND	0.220 j	NR
Fluoranthene	0.180 j	0.120 j	0.140 j	0.061 j	1.50	NR
Pyrene	0.160 j	0.110 j	●	●	1.60	NR
Benzo(a)anthracene	ND	ND	ND	ND	1.00	NR
Chrysene	ND	ND	ND	ND	1.20	NR
bis(2-Ethylhexyl)phthalate	0.200 j	0.250 j	0.310 j	0.340	0.450 j	NR
Benzo(b)fluoranthene	ND	ND	ND	ND	1.10	NR
Benzo(k)fluoranthene	ND	ND	ND	ND	0.640	NR
Benzo(a)pyrene	ND	ND	ND	ND	1.00	NR
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	ND	0.510 j	NR
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	NR
Benzo(g,h,i)perylene	ND	ND	ND	ND	0.520	NR

● - Spiking compound; data not representative of actual sample concentration.
j - Estimated concentration; compound present below quantitation limit.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Not run.
RE - Reextracted analysis.
MSD - Matrix spike duplicate.

SHALLOW SOIL SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EADEC-B (0-6 in.)	EADEC-D (0-6 in.)	MS EADEC-D (0-6 in.)	MSD EADEC-D (0-6 in.)	EADEC-E (0-6 in.)	RE EADEC-E (0-6 in.)
SEMIVOLATILE ORGANICS (mg/kg)						
Tentatively Identified Compounds						
Unknown	0.069 j	0.400 j	NR	NR	0.530 (2) j	NR
Aliphatic hydrocarbon	0.086 j	0.069 j	NR	NR	1.729 (6) j	NR
Benzo[j]fluoranthene	0.150 j	0.120 j	NR	NR	ND	NR
Benzo[e]pyrene	0.069 j	ND	NR	NR	ND	NR
Benzene, (1-methylpropyl)-	ND	0.087 j	NR	NR	ND	NR
Benzamide	ND	0.069 j	NR	NR	ND	NR
Ethyldimethylbenzene isomer	ND	ND	NR	NR	0.290 j	NR
Dihydrodimethylindene isomer	ND	ND	NR	NR	0.290 j	NR
Naphthalene, 1-methyl-	ND	ND	NR	NR	0.260 j	NR
Dimethylnaphthalene isomer	ND	ND	NR	NR	0.400 (2) j	NR
Unknown acid	ND	ND	NR	NR	4.060 (3) j	NR
Methylphenanthrene isomer	ND	ND	NR	NR	1.06 (2) j	NR
Unknown phthalate	ND	ND	NR	NR	0.790 j	NR
Sitosterol isomer	ND	ND	NR	NR	4.20 j	NR

( ) - Number of compounds in total.
j - Estimated concentration; compound present below quantitation limit.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Not run.
RE - Reextracted analysis.
MSD - Matrix spike duplicate.

SHALLOW SOIL SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EADEC-A (0-6 in.)	EADEC-B (0-6 in.)	EADEC-C (0-6 in.)	EADEC-D (0-6 in.)	MS EADEC-D (0-6 in.)	MSD EADEC-D (0-6 in.)	EADEC-E (0-6 in.)	DL EADEC-E (0-6 in.)	EADEC-F (0-6 in.)	EPA cleanup LEVEL^
PESTICIDES/PCBs (mg/kg)										
Heptachlor epoxide	NR	ND	NR	ND	ND	ND	0.016 p x	ND	NR	-
Endosulfan I	NR	ND	NR	ND	ND	ND	0.036 p x e	ND	NR	-
Dieldrin	NR	ND	NR	ND	●	●	0.100 x e	ND	NR	-
4,4'-DDE	NR	0.0018 j p	NR	ND	ND	ND	ND	ND	NR	-
Endrin	NR	ND	NR	ND	●	●	0.095 p x	ND	NR	-
Endosulfan II	NR	ND	NR	ND	ND	ND	0.098 p x e	ND	NR	-
4,4'-DDD	NR	ND	NR	ND	ND	ND	0.021 x	ND	NR	-
Endosulfan sulfate	NR	ND	NR	ND	0.00123 j	0.0021 j p	0.049 p x	ND	NR	-
4,4'-DDT	NR	ND	NR	ND	ND	ND	0.073 p x e	ND	NR	-
Methoxychlor	NR	ND	NR	ND	ND	ND	0.017 j p x	ND	NR	-
Endrin ketone	NR	ND	NR	ND	0.0013 j	ND	0.025 p x e	ND	NR	-
Endrin aldehyde	NR	ND	NR	ND	ND	ND	0.075 p x e	ND	NR	-
alpha-Chlordane	NR	0.0016 j	0.0035 *	ND	ND	ND	ND	ND	NR	-
gamma-Chlordane	NR	0.0019 p	0.0046 *	ND	ND	ND	0.043 p x	ND	NR	-
Aroclor 1254	ND	ND	ND	ND	ND	ND	8.20	12.0	0.024 j p	10
Aroclor 1260	0.420	ND	0.026 j	ND	ND	ND	ND	ND	0.035 j p	10

● - Spiking compound; data not representative of actual sample concentration.
* - These compounds were reported due to elevated levels present in the sample analyzed for PCBs.
^ - Reference 14, Appendix A; cleanup level is for total PCBs.
e - Estimated concentration; exceeds GC/MS calibration range.
j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB target analyte has >25% difference for the detected concentrations between the two GC columns.
x - PCB isomers contributed to these chromatogram peaks and likely resulted in elevated concentrations.
DL - Diluted sample analysis; see Appendix G for dilution factor.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Not run.
MSD - Matrix spike duplicate.

SHALLOW SOIL SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EADEC-B (0-6 in.)	EADEC-D (0-6 in.)	DUP EADEC-D (0-6 in.)	EADEC-E (0-6 in.)	NATIVE SOIL CONCENTRATIONS TYPICAL RANGE (n)
TAL METALS (mg/kg)					
Aluminum	4,060	8,800	9,020	7,460	10,000 - 300,000
Antimony	4.0	20.3	17.5	8.0 B	0.6 - 10
Arsenic	6.8 SA	91.5 SA	94.6	4.9	1.0 - 40
Barium	161	216	211	124	100 - 3,500
Beryllium	2.4	1.5	1.5	1.2 B	0.1 - 40
Cadmium	1.4	1.7	1.9	7.6	0.01 - 7.0
Calcium	128,000	56,200	59,900	36,700	100 - 400,000
Chromium	9.8	25.6	21.8	85.4	5.0 - 3,000
Cobalt	4.2	6.9 B	7.3 B	6.7 B	1.0 - 40
Copper	16.7	101	98.9	160	2.0 - 100
Iron	8,630	15,300	16,100	14,600	7,000 - 550,000
Lead	105 N SA	279 N	277	2,030 N	2.0 - 200
Magnesium	61,700	28,100	30,900	7,780	600 - 6,000
Manganese	152	375	360	332	100 - 4,000
Mercury **	0.13 N	1.2 N	1.0	0.44 N	0.01 - 0.08
Nickel	8.5	14.7	17.4	34.3	5.0 - 1,000
Potassium	1,670	1,940	2,010	887 B	400 - 30,000
Selenium	ND W	ND	ND	ND W	0.1 - 2.0
Silver	ND	ND	ND	ND	0.1 - 5.0
Sodium	98.0	190 B	196 B	200 B	750 - 7,500
Thallium	ND	ND	ND	ND	0.1 -12
Vanadium	13.2	29.0	27.8	35.9	20 - 500
Zinc	51.7	278	272	1,640	10 - 300
Cyanide	ND	ND	ND	ND	-

(n) - Ref. 21, Appendix A.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
N - Spiked sample recovery is not within control limits.
** - Mercury results are likely biased low as the matrix spike recovered at 30.8%; actual concentration may be greater than those reported.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
SA - Value determined by the method of standard addition.
DUP - Duplicate sample analysis.

SHALLOW SOIL SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EASESS-1 (0-3 in.)	DL EASESS-1 (0-3 in.)	EASESS-2 (0-6 in.)	EASESS-3 (0-3 in.)	DL EASESS-3 (0-3 in.)	EASESS-4 (0-6 in.)	EASESS-5 (0-3 in.)	EASESS-6 (0-6 in.)	EPA CLEAN UP LEVEL^
PCBs (mg/kg)									
Aroclor 1254	ND	ND	ND	0.340 p	0.900 j	0.067	0.054	0.180	10
Aroclor 1260	0.064	ND	0.070	3.60 e	5.30	0.046 p	0.036 j	0.092	10
alpha-Chlordane*	0.480 e p	0.530	NR	NR	NR	NR	NR	NR	-
gamma-Chlordane*	0.610 e p	0.600	NR	NR	NR	NR	NR	NR	-

^ - Reference 14, Appendix A; cleanup level is for total PCBs.
* - These compounds were reported due to elevated levels present in the samples analyzed for PCBs.
e - Estimated concentration; exceeds GC/MS calibration range.
j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB target analyte has >25% difference for the detected concentrations between the two GC columns.
DL - Diluted sample analysis; see Appendix G for dilution factor.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Not run.

SHALLOW SOIL SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EASESS-7 (0-3 in.)	EASESS-8 (0-6 in.)	EASESS-9 (0-3 in.)	EASESS-10 (0-6 in.)	EASESS-11 (0-3 in.)	EASWSS-1 (0-6 in.)	MS EASWSS-1 (0-6 in.)	MSD EASWSS-1 (0-6 in.)	EASWSS-2 (0-3in.)	EASWSS-3 (0-6 in.)	EPA CLEAN UP LEVEL^
PCBs (mg/kg)											
Aroclor 1254	0.800 p	0.290 p	0.390 p	0.049	0.014 j p	0.019 j p	ND	ND	0.026 j	ND	10
Aroclor 1260	0.290 p	0.170 p	0.170 p	0.100	0.028 j	0.041	●	●	0.041 p	ND	10

● - Spiking compound; data not representative of actual sample concentration.
^ - Reference 14, Appendix A; cleanup level is for total PCBs.
j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB target analyte has >25% difference for the detected concentrations between the two GC columns.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Not run.
MSD - Matrix spike duplicate.

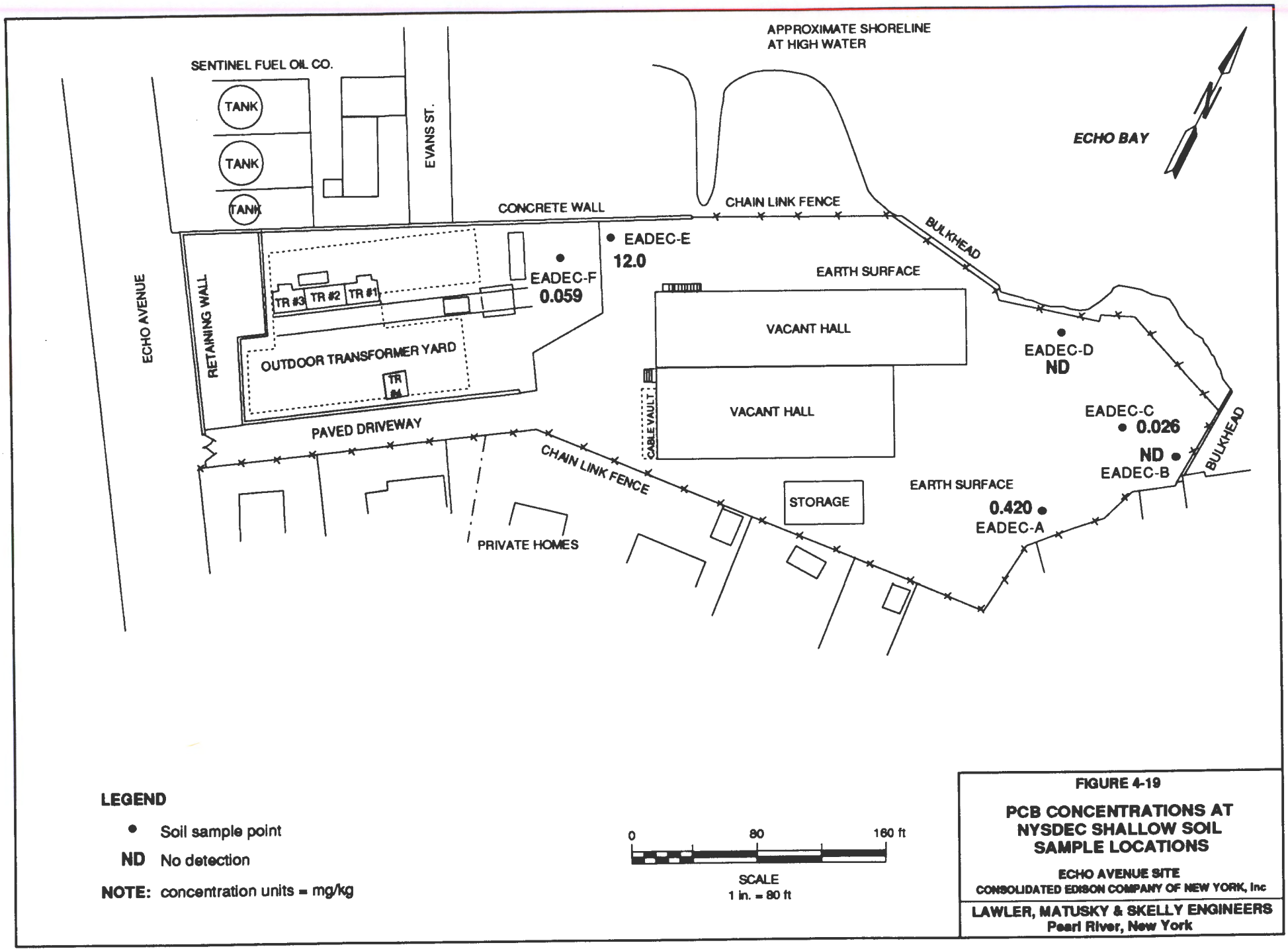
SHALLOW SOIL SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EASWSS-4 (0-3 in.)	EASWSS-5 (0-6 in.)	EASWSS-6 (0-3 in.)	EASWSS-7 (0-3 in.)	EASWSS-8 (0-6 in.)	EPA cleanup LEVEL^
PCBs (mg/kg)						
Aroclor 1254	ND	0.018 j p	ND	0.023 j p	ND	10
Aroclor 1260	0.013 j p	0.045 p	0.026 j	0.057	0.021 j	10

PARAMETER	EATM5-SS (SURF.)	EA POTABLE WATER (µg/l)	FIELD BLANK 3 (µg/l)	FIELD BLANK 5 (µg/l)	EPA cleanup LEVEL^
PCBs (mg/kg)					
Aroclor 1254	0.140 p	ND	ND	ND	10
Aroclor 1260	0.240 p	ND	ND	ND	10

^ - Reference 14, Appendix A; cleanup level is for total PCBs.
j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB target analyte has >25% difference for the detected concentrations between the two GC columns.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.



LEGEND

- • Soil sample point
- **ND** No detection

NOTE: concentration units = mg/kg

0 80 160 ft

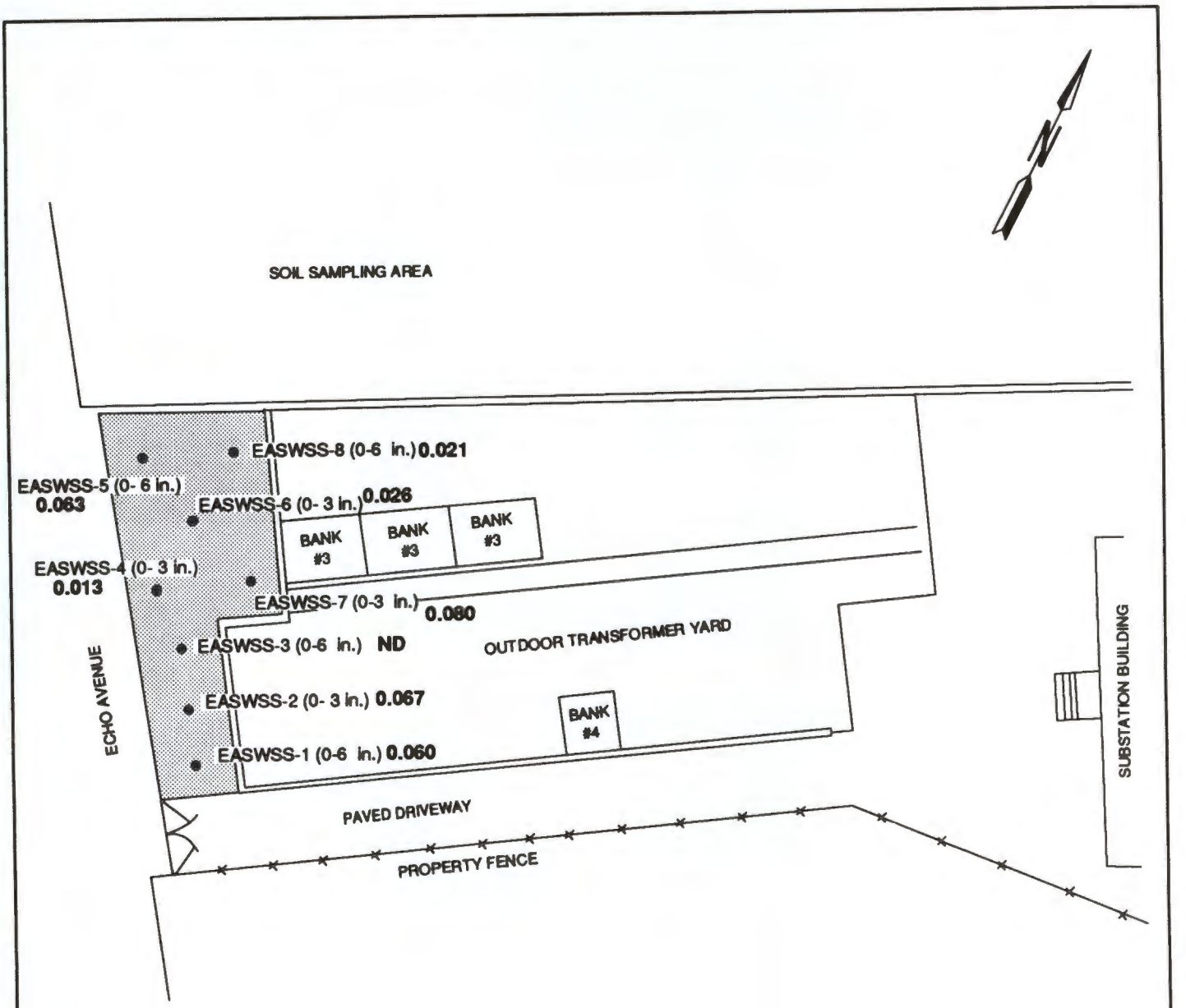
SCALE
1 in. = 80 ft

FIGURE 4-19

PCB CONCENTRATIONS AT NYSDEC SHALLOW SOIL SAMPLE LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



LEGEND

- • Soil sample point
- **ND** No detection

NOTE: Concentration units = mg/kg

0 50 100 ft

SCALE
1 in. = 50

FIGURE 4-20

PCB CONCENTRATIONS SHALLOW SOIL SAMPLES AT SOUTHWESTERN END OF PROPERTY

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

found at estimated concentrations totaling 0.745 mg/kg. The third sample, EADEC-E, was collected off the concrete wall on the northern portion of the property in a small "compost" pile. The sample had 9.95 mg/kg of PAHs, 0.450 mg/kg of PAEs, and 0.240 mg/kg of 2-MN. TICs totaled 13.609 mg/kg in sample EADEC-E. The PAHs were probably associated with petroleum and asphalt products, the PAEs are found in plastics and plasticizers, and naphthalene and like substances are associated with diesel fuel.

4.5.3.3 ***Pesticides/PCBs***. Pesticides analysis was performed on the three NYSDEC samples. EADEC-B had 4,4'-DDE at 0.0018 mg/kg and alpha- and gamma-chlordane at 0.0016 and 0.0019 mg/kg, respectively. EADEC-D had no detectable pesticides. EADEC-E had a wide range of pesticides found at low levels but, as noted in Table 4-18, the quantification of these pesticide concentrations may have included interferences from PCBs. The pesticides detected included heptachlor epoxide at 0.016 mg/kg; endosulfan I at 0.036 mg/kg; dieldrin at 0.100 mg/kg; endrin at 0.095 mg/kg; endosulfan II at 0.098 mg/kg; 4,4'-DDD at 0.021 mg/kg; endosulfan sulfate at 0.049 mg/kg; 4,4'-DDT at 0.073 mg/kg; methoxychlor at 0.017 mg/kg; endrin ketone at 0.025 mg/kg; endrin aldehyde at 0.075 mg/kg; and gamma-chlordane at 0.043 mg/kg. These compounds generally fall into the broad spectrum insecticides of the group of polycyclic chlorinated hydrocarbons called cyclodiene insecticides (Ref. 23, Appendix A). The compost pile is the probable source of these insecticides, which were most likely used for termite and other insect control. The MS and MSD EADEC-D samples had 0.0013 and 0.0021 mg/kg of 4,4'-DDD, respectively, and 0.0013 mg/kg of endrin ketone was detected in the MS.

The remaining three NYSDEC samples and other samples were analyzed for PCBs only. The PCB results for the six NYSDEC samples are shown on Figure 4-19. Except for sample EADEC-E, all of these samples had concentrations less than 1 mg/kg. EADEC-E had 12.0 mg/kg of PCBs, as compared to the cleanup level of 10 mg/kg for substations in residential areas. Sample EADEC-C also had 0.0035 mg/kg of alpha-chlordane and 0.0046 mg/kg of gamma-chlordane. Even though pesticides analyses were not run on this sample, the laboratory found peaks on the chromatogram not associated with PCBs and identified the peaks as the chlordane compounds.

The results of the PCB analyses performed on the 11 shallow soil samples collected in the southeastern end of the property are shown on Figure 4-18. None of the concentrations exceeded the EPA cleanup level of 10 mg/kg, ranging from a low of 0.042 mg/kg in EASESS-11 to a high of 6.200 mg/kg in EASESS-3. There appears to be no correlation of PCB concentrations with depth (i.e., 0-3 in. or 0-6 in.); the two highest and two lowest PCB concentrations were found in the 0- to 3-in. samples. The Aroclors found include 1254 and 1260, both of which are associated with transformer oils from electrical substations. One of the samples, EASESS-1, also had 0.530 and 0.600 mg/kg of alpha- and gamma-chlordane, respectively. These pesticides were reported because of the elevated levels found in the chromatogram.

The PCB results from the analyses performed on the eight samples taken in the southwestern portion of the property are shown on Figure 4-20. None of the samples had PCB concentrations exceeding the EPA cleanup level, with the results ranging from ND at EASWSS-3 to 0.080 mg/kg at EASWSS-7.

The one sample collected from transformer moat 5 had a total PCB concentration of 0.380 mg/kg, much less than the EPA cleanup level.

4.5.3.4 ***Metals and Cyanide.*** Metals and cyanide analyses were performed on three of the NYSDEC samples and the results are shown on Table 4-18. Several metals were detected outside the range of typical native soil concentrations: antimony, arsenic, cadmium, copper, lead, magnesium, mercury, and zinc. Antimony is used in abrasives, pigments, flameproofing compounds, plasticizers, catalysts, paints, pharmaceuticals, and explosives. Arsenic is used in insecticides, pharmaceuticals, and pigments. Cadmium is used as a protective coating, in insecticides, in electrodes, and in the manufacture of fluorescent lamps, semiconductors, photocells, and jewelry. Copper is used in the electrical industry and its compounds are used as insecticides, pigments, and catalysts. Lead is often associated with fuel products. Mercury has many uses, including in tanning and dyeing, textile manufacture, photography, paints and pigments, and disinfectants and herbicides. Zinc compounds are used as pigments and vulcanizing aids, in paints and varnishes, as wood preservatives, and in the manufacture of dyes (Ref. 23, Appendix A).

The antimony and arsenic concentrations were outside the range for native soils only in the EADEC-D sample; the results were approximately double the native soil value for both metals. Cadmium and zinc were outside the range in only one sample, EADEC-E, with the results just over the range for cadmium and five times the range for zinc. Copper and lead were over the range in two samples, EADEC-D and EADEC-E. The copper results were just at the upper end of the range in EADEC-D and were one and a half times the upper end of the range in EADEC-E. Lead was slightly over the range in EADEC-D and an order of magnitude higher in EADEC-E. Magnesium and mercury results were above the range in all three samples, with EADEC-B having the highest magnesium value at an order of magnitude higher than the range. Mercury results were twice as high to over an order of magnitude higher. Magnesium is an abundant common element associated with hardness in water. The high metals found in the soil may be associated with the fill material found on the surface of the site.

4.5.4 **Groundwater Data**

Six monitoring wells were sampled twice as part of the Phase II investigation, including one new well installed as part of this investigation. Wells along Echo Bay were sampled during the falling tide to minimize the tidal influences of Echo Bay (i.e., data would reflect groundwater moving from the site into the bay rather than the reverse). Based on measured on-site groundwater elevations, which indicate groundwater flows to the northeast toward the bay, both EAMW-6 and EAMW-1 may be considered to be upgradient background wells. Groundwater analytical data and NYSDEC groundwater standards are presented in Table 4-19. Monitoring wells EAAMW-4 and -5 are saline; thus the groundwater (drinking water) standards are not appropriate for these two wells. Where available, data on typical groundwater concentrations are also provided (Ref. 21, Appendix A). A blind duplicate sample was collected from EAMW-6 and data from this sample are presented in the table as sample EAMW-7. For the second round of sampling, low-level methodologies were used for the VOC and PCB analyses to detect low concentrations of these constituents. Due to laboratory error, the holding time for VOCs was exceeded during this second round of sampling and the wells had to be resampled and reanalyzed for VOCs. Resampling took place in December 1992; the resulting data are included in Table 4-19. Figure 4-21 presents

TABLE 4-19 (Page 1 of 5)

GROUNDWATER DATA SUMMARY (JULY, SEPTEMBER, & DECEMBER 1992)

CON EDISON - Echo Avenue

PARAMETER	EAMW-1 Jul 92	RE EAMW-1 Jul 92	EAMW-1 Sep 92**	EAMW-1 Dec 92**	EAMW-2 Jul 92	EAMW-2 Sep 92**	EAMW-2 Dec 92**	EAMW-3 Jul 92	RE EAMW-3 Jul 92	FILTRATE EAMW-3 Jul 92	EAMW-3 Sep 92***	EAMW-3 Dec 92**	FIELD BLANK-9 Sep 92	NYSDEC CLASS GA STANDARDS
VOLATILE ORGANICS (µg/l)	ND	NR	NU	ND	ND	NU	ND	ND	NR	NR	NU	ND	ND	-
Tentatively Identified Compounds														
Unknown	ND	NR	NU	ND	ND	NU	ND	8.0 j	NR	NR	NU	ND	ND	50 GV
2-Propanone	ND	ND	NU	2 j	ND	NU	1.0 j	ND	NR	NR	NU	1.0 j	ND	50 GV
Carbon disulfide	ND	ND	NU	ND	ND	NU	3.0 j	ND	NR	NR	NU	ND	ND	50 GV
SEMIVOLATILE ORGANICS (µg/l)														
bis(2-Ethylhexyl)phthalate	2 b j	6.5 b	39 b	NR	1.5 j	15 b	NR	ND	11 b	NR	30 b	NR	19 b	50
Tentatively Identified Compounds														
Unknown hydrocarbon	2 j	27.5 (8) j	2 j	NR	ND	ND	NR	ND	ND	NR	ND	NR	NR	50 GV
Unknown	ND	ND	ND	NR	2 j	10 j	NR	3 j	2.5 j	NR	ND	NR	NR	50 GV
Unknown phthalate	ND	ND	ND	NR	5 j	ND	NR	ND	ND	NR	ND	NR	NR	50 GV
Unknown acid	ND	ND	ND	NR	ND	ND	NR	10 j	ND	NR	ND	NR	NR	50 GV
alpha-Amyrin	ND	ND	80 j	NR	ND	ND	NR	ND	ND	NR	ND	NR	NR	50 GV
PESTICIDES/PCBs (µg/l)	ND	NR	ND	NR	ND	ND	NR	ND	NR	ND ±	ND	NR	ND	-

( ) - Number of compounds in total.
* - Pesticides/PCB samples were analyzed using low-level methods in accordance with NYSDEC CLP 12/91 protocol.
** - 9/92 and 12/92 volatile samples were analyzed using EPA low-level method 542.2.
± - Sample only analyzed for PCBs.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
GV - Guidance value.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Not run.
NU - Data not usable due to holding time violation.
RE - Re-analysis.

GROUNDWATER DATA SUMMARY (JULY, SEPTEMBER, & DECEMBER 1992)

CON EDISON - Echo Avenue

PARAMETER	EAMW-4 Jul 92	EAMW-4 Sep 92*,**	EAMW-4 Dec 92**	EAMW-5 Jul 92	EAMW-5 Sep 92*,**	EAMW-5 Dec 92**	EAMW-6 Jul 92	EAMW-6 Sep 92*,**	EAMW-6 Dec 92**	NYSDEC CLASS GA STANDARDS
VOLATILE ORGANICS (µg/l)										
Toluene	2 j	NU	ND	ND	NU	ND	ND	NU	ND	5.0
Tentatively Identified Compounds										
Unknown	5.0 j	NU	ND	ND	NU	ND	ND	NU	ND	50 GV
2-Propanone	ND	NU	ND	ND	NU	1.0 j	ND	NU	ND	50 GV
SEMIVOLATILE ORGANICS (µg/l)										
bis(2-Ethylhexyl)phthalate	ND	25 b	NR	9 b	22 b	NR	1.5 j	13 b	NR	50
Tentatively Identified Compounds										
Unknown hydrocarbon	ND	10 (3) j	NR	ND	23 (2) j	NR	ND	26 (7) j	NR	50 GV
Unknown	ND	24 (7) j	NR	ND	ND	NR	2 j	53 (4) j	NR	50 GV
Unknown polycyclic cpd.	ND	5 j	NR	ND	ND	NR	ND	ND	NR	50 GV
Unknown cyclic cpd.	ND	3 j	NR	ND	ND	NR	ND	ND	NR	50 GV
Phenol, 4,4'-butylidenebis(2	ND	ND	NR	ND	ND	NR	ND	3 j	NR	50 GV
PESTICIDES/PCBs (µg/l)	ND	ND	NR	ND	ND	NR	ND	ND	NR	-

( ) - Number of compounds in total.
* - Pesticides/PCB samples were analyzed using low-level methods in accordance with NYSDEC CLP 12/91 protocol.
** - 9/92 and 12/92 volatile samples were analyzed using EPA low-level method 542.2.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
GV - Guidance value.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Guidance value.
NU - Data not usable due to holding time violation.

GROUNDWATER DATA SUMMARY (JULY, SEPTEMBER, & DECEMBER 1992)

CON EDISON - Echo Avenue

PARAMETER	EAMW-1 Jul 92	EAMW-1 Sep 92	EAMW-2 Jul 92	EAMW-2 Sep 92	EAMW-3 Jul 92	FILTRATE EAMW-3 Jul 92	EAMW-3 Sep 92	EAMW-4 Jul 92	EAMW-4 Sep 92	NYSDEC CLASS GA STANDARDS	NATURAL GW AMBIENT RANGES (n)
TAL METALS (µg/l)											
Aluminum	919	442	10,700	2,990	94,100	ND	50,800	254	1,190	NS	<5.0 - 1,000
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.0 GV	-
Arsenic	29.8	15.7 N	36.2	26.4 N	4.4 B	ND	3.4 B N	11.7 SA	10.8 N	25	<1.0 - 30
Barium	72.5 B	43.8 B	109 B	51.4 B	810	122 B	459	70.8 B	72.1 B	1,000	10 - 500
Beryllium	ND	ND	ND	0.80 B	5.6	1.9 B	3.6 B	3.3 B	3.6 B	3.0 GV	<10
Cadmium	11.0	4.4 B N	5.0	ND N	26.3	3.8 B	14.5 N	ND	ND N	10	<1.0
Calcium	27,700	20,800	38,600	36,600	62,100	51,400	59,700	211,000	199,000	NS	1,000 - 150,000
Chromium	ND	ND	27.1	9.6 B	200	ND	109	ND	ND	50	<1.0 - 5.0
Cobalt	8.8 B	ND N	ND	ND N	60.5	ND	37.9 B N	ND	ND N	NS	<10
Copper	17.6 B	9.4 B	27.8	8.4 B	149	5.6 B	83.7	29.3	27.9	200	<1.0 - 30
Iron	26,800	10,700 N	12,300	4,270	118,000	139	60,400 N	9,170	2,490 N	300 (m)	10 - 10,000
Lead	17.0 N	8.9	27.8 N	7.9	88.9 N	ND N	58.9 SA	18.9 N +	21.0 W	25	<15
Magnesium	11,000	6,920	3,770 B	3,320 B	25,000	3,400 B	16,500	64,600	605,000	35,000 GV	1,000 - 50,000
Manganese	1,180	429 E N	225	189 E N	1,660	626	1,110 E N	648	214 E N	300 (m)	<1.0 - 1,000
Mercury	ND N	ND	0.23 N	ND	0.44 N	ND N	0.14 B	0.39 N	0.40	2.0	<1.0
Nickel	ND	15.2 B N	13.0 B	9.6 B N	158	ND	95.0 N	ND	12.9 B N	NS	<10 - 50
Potassium	6,260	4,320 B	17,800	16,800	16,900	5,130	12,900	209,000	161,000	NS	1,000 - 10,000
Selenium	ND	ND N W	ND	1.2 B N W	ND W	ND W	ND N W	ND W	ND N	10	<1.0 - 10
Silver	ND	ND N	ND	ND N	ND	ND	ND N	3.7 B	ND N	50	<5.0
Sodium	84,700	40,500	32,000	34,300	20,100	19,300	21,500	531,000	979,000 E	20,000	500 - 120,000
Thallium *	ND N W	ND N	ND N W	ND N	1.5 B	ND N	ND N W	11.0 B	ND N W	4.0 GV	-
Vanadium	ND	3.7 B	ND	9.0 B	234	ND	127	ND	7.6 B	NS	<1.0 - 10
Zinc	104	150	64.8	33.5	470	3.1 B	291	172	244	300	<10 - 2,000
Cyanide	ND	ND	ND	ND	ND	NR	ND	ND	ND	100	-

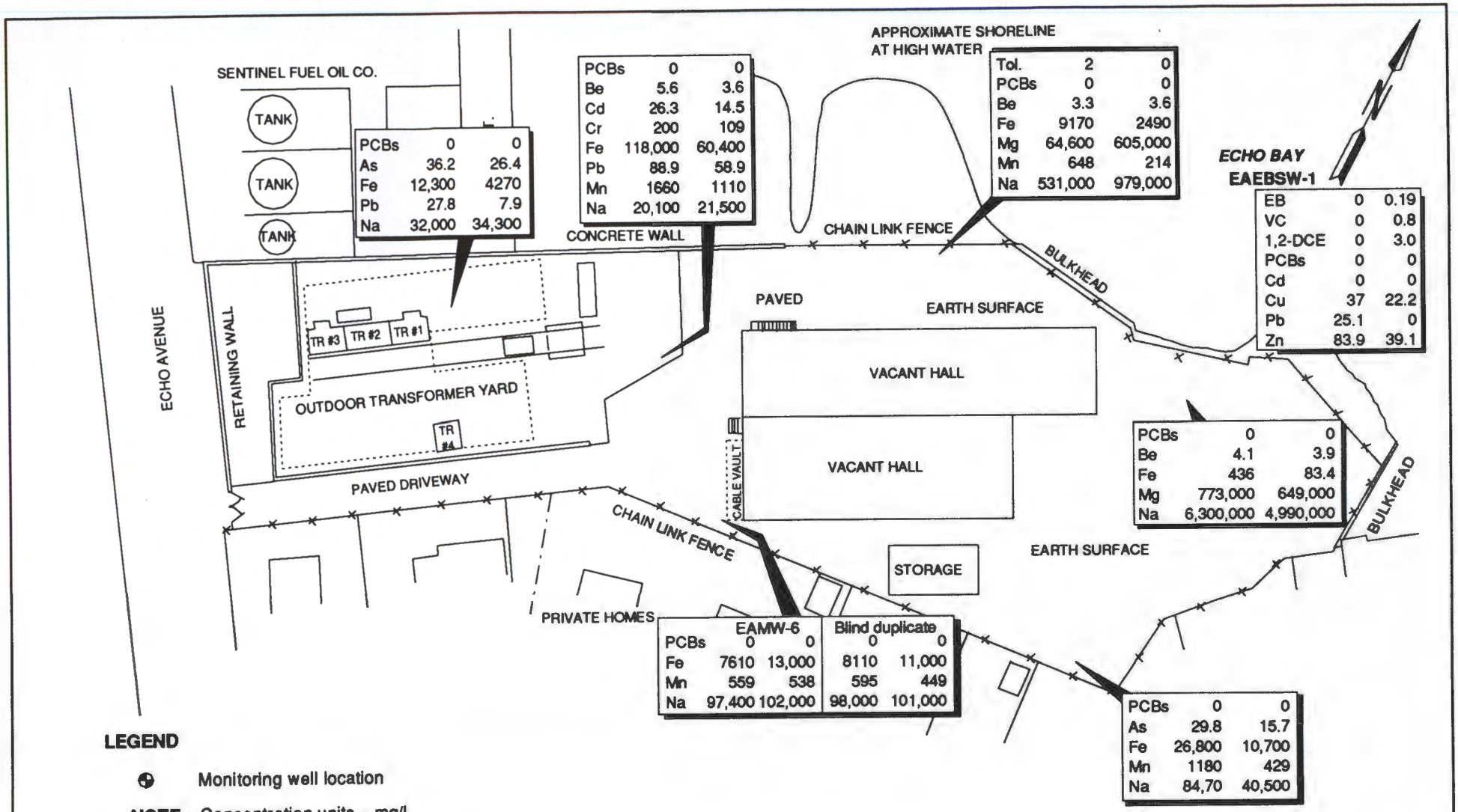
(m) - Iron and manganese not to exceed 500 µg/l.
(n) - Ref. 21, Appendix A.
\+ - Correlation coefficient for the MSA is <0.995.
* - Thallium results are likely biased low due to low matrix spike recovery; actual concentrations may exceed the detection limit.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
E - Estimated value.
N - Spiked sample recovery is not within control limits.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NS - No standard.
SA - Value determined by the method of standard addition.

GROUNDWATER DATA SUMMARY (JULY, SEPTEMBER, & DECEMBER 1992)

CON EDISON - Echo Avenue

PARAMETER	EAMW-6 Jul 92	EAMW-5 Sep 92	EAMW-6 Jul 92	EAMW-6 Sep 92	EAMW-7 Jul 92	EAMW-7 Sep 92	FIELD BLANK 8 Jul 92	FIELD BLANK 9 Sep 92	NYSDEC CLASS GA STANDARDS	NATURAL GW AMBIENT RANGES (n)
TAL METALS (µg/l)										
Aluminum	216	32.0 B	4,880	8,480	5,080	7,330	ND	11.1 B	NS	<5.0 - 1,000
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	3.0 GV	-
Arsenic	ND W	ND N W	ND	ND N	ND	ND N	ND	ND N	25	<1.0 - 30
Barium	127 B	146 B	114 B	166 B	116 B	153 B	ND	ND	1,000	10 - 500
Beryllium	4.1 B	3.9 B	ND	1.0 B	ND	1.2 B	ND	ND	3.0 GV	<10
Cadmium	ND	ND N	ND	ND N	3.3 B	3.0 B N	ND	ND N	10	<1.0
Calcium	257,000	231,000	51,900	56,400	52,100	57,200	75.0 B	63.8 B	NS	1,000 - 150,000
Chromium	ND	ND	9.2 B	20.7	14.4	18.0	ND	ND	50	<1.0 - 5.0
Cobalt	ND	ND N	ND	ND N	ND	ND N	ND	ND N	NS	<10
Copper	15.3 B	10.7 B	19.6 B	24.0 B	18.6 B	20.9 B	ND	ND	200	<1.0 - 30
Iron	436	83.4 B N	7,610	13,000 N	8,110	11,000 N	ND	ND N	300 (m)	10 - 10,000
Lead	ND N W R	ND W	2.2 B N R	5.1	2.8 B N R	4.5	ND N R	ND	25	<15
Magnesium	773,000	649,000	17,800	19,900	17,700	19,900	ND	118 B	35,000 GV	1,000 - 50,000
Manganese	6.0 B	ND E N	559	538 E N	595	449 E N	ND	ND E N	300 (m)	<1.0 - 1,000
Mercury	ND N	ND	ND N	ND	ND N	ND	ND N	ND	2.0	<1.0
Nickel	ND	7.3 B N	ND	14.9 B N	18.3 B	21.2 B N	ND	ND N	NS	<10 - 50
Potassium	252,000	189,000	7,060	9,020	7,230	8,280	ND	73.6 B	NS	1,000 - 10,000
Selenium	ND W	4.5 B N	ND	1.1 B N	ND	1.4 B N	ND W	ND N	10	<1.0 - 10
Silver	ND	ND N	ND	ND N	ND	ND N	ND	ND N	50	<5.0
Sodium	6,300,000	4,990,000	97,400	102,000	98,000	101,000	40.3 B	1,160 B	20,000	500 - 120,000
Thallium *	ND N	ND N W	ND N W	ND N	ND N W	ND N	ND N	ND N	4.0 GV	-
Vanadium	ND	3.4 B	ND	26.7 B	ND	23.7 B	ND	ND	NS	<1.0 - 10
Zinc	46	30.8	29.1	59.9	36.9	49.7	4.7 B	7.2 B	300	<10 - 2,000
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	100	-

(m) - Iron and manganese not to exceed 500 µg/l.
(n) - Ref. 21, Appendix A.
B - Value is less than the contract-required detection limit but greater t detection limit.
E - Value estimated due to interference.
N - Spiked sample recovery is not within control limits.
R - Duplicate analysis not within control limits.
* - Thallium results are likely biased low due to low matrix spike recovery; actual concentrations may exceed the detection limit.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
GV - Guidance value.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NS - No standard.
SA - Value determined by the method of standard addition.



LEGEND

⊕ Monitoring well location

NOTE: Concentration units = mg/l

ABBREVIATIONS

As	Arsenic	Mg	Magnesium	1,2-DCE	cis-1,2-dichloroethylene
Be	Beryllium	Mn	Manganese	VC	Vinyl chloride
Cd	Cadmium	Na	Sodium	EB	Ethyl benzene
Cr	Chromium	Pb	Lead		
Cu	Copper	Tol	Toluene		
Fe	Iron	Zn	Zinc		

0 80 160 ft

SCALE
1 in. = 80 ft

NOTE: First number is from first round (July 1992), second number is from second round (Sept. 1992); volatiles (Dec. 1992).

FIGURE 4-21

SELECTED CHEMICAL CONSTITUENTS IN THE GROUNDWATER AND ECHO BAY

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

a graphical summary of the data. Appendices G and H include the analytical data reports and the date usability report, respectively.

4.5.4.1 ***Volatile Organics.*** The first round sample from EAMW-4 had an estimated concentration of 2 µg/l of toluene, below the groundwater standard of 5 µg/l. No TCL VOCs were detected in any other samples during the first or second round of sampling.

Unknown VOC TICs were found in two samples during the first round, 8 µg/l in EAMW-3 and 5 µg/l in EAMW-4, both below the guidance value of 50 µg/l. 2-propanone also known as acetone was detected as a TIC in four samples during the December resampling: 2 µg/l in MW-1, 1 µg/l in MW-2, 1 µg/l in MW-3, and 1 µg/l in MW-5. One additional TIC, carbon disulfide was detected in MW-2 at a concentration of 3 µg/l. All concentrations were below the guidance value of 50 µg/l. The field blank during the first round had 20 µg/l of hexane. Hexane was used to decontaminate the sampling equipment and it is therefore likely that the hexane is from this decontamination procedure. The December 1992 field blank had 1 µg/l of hexane and 1 µg/l of 2-propanone (acetone). Since acetone is a common laboratory contaminant, the finding of such low levels is not unexpected.

4.5.4.2 ***Semivolatile Organics.*** B2EHP was detected in all but three of the samples at concentrations, ranging from 1.5 µg/l to 44 µg/l. The field blank for both sampling events also had detectable levels of B2EHP as did the method blanks. B2EHP is a common laboratory contaminant and its presence in these samples is most likely due to laboratory contamination.

Semivolatile TICs, consisting mostly of unknowns, were found in most of the samples. Total concentrations of semivolatile TICs in the first and second groundwater samples were 27.5 and 82 µg/l in EAMW-1, 1.5 and 15 µg/l in EAMW-2, 2.5 µg/l and ND in EAMW-3, ND and 42 µg/l in EAMW-4, ND and 23 µg/l in EAMW-5, 2 and 82 µg/l in EAMW-6, and 5 and 37 µg/l in the blind duplicate for EAMW-6. The guidance value for individual TIC compounds is 50 µg/l. Therefore, the only sample that exceeded this guidance value was the second round sample from EAMW-1, with a concentration of 80 µg/l of alpha-amyrin. As this is an upgradient well, this chemical may be from an off-site source.

4.5.4.3 ***Pesticides/PCBs.*** None of the groundwater samples collected and analyzed during either the first or second round of sampling contained any pesticides or PCBs even though the second round of sampling used an analytical methodology that achieved a quantitation level of at least 0.29 µg/l for most of the PCB Aroclors (specifically the two associated with transformer oils, 1254 and 1260). The groundwater standard for PCBs is 0.1 µg/l. Although the PCB quantitation limit is somewhat higher than the groundwater standard, this methodology would have detected levels below 0.1 µg/l, which would have been reported as an estimated value. Therefore, it can be said that PCBs were not detected in the groundwater. Because of the high turbidity found in EAMW-3 during the first round, the sample was filtered in the field and analyzed for PCBs; no PCBs were detected.

The total of all organic contaminants in µg/l found in each well and the blind duplicate at EAMW-6 is summarized below, with the first value from the first round and the second value from the second round:

	EAMW-1	EAMW-2	EAMW-3	EAMW-4	EAMW-5	EAMW-6
TCL VOCs	0,0	0,0	0,0	2,0	0,0	0,0/0,0
TIC VOCs	0,0	0,0	8,0	5,0	0,0	0,0/0,0
TCL SVOCs	6.5,39	1.5/15	11,30	0,25	9,22	1.5,13/0/44
TIC SVOCs	27.5,82	7,10	2.5,0	0,42	0,23	2,82/5,37
Pesticides/PCBs	0,0	0,0	0,0	0,0	0,0	0,0/0,0
Total	34,121	8.5,25	21.5,30	7,67	9,45	3.5,95/5,81

4.5.4.4 ***Metals and Cyanide.*** In upgradient well EAMW-1, four metals were detected during the first round and three metals during the second round that exceeded the groundwater standards. These metals were arsenic, iron, manganese, and sodium; with the latter three above the standard in the second round. Arsenic in the first round was only slightly higher than the standard of 25 µg/l at a level of 29.8 µg/l; the value was still within the range for natural ambient groundwater. Iron was higher than the standard of 300 µg/l in both samples and also exceeded the natural ambient groundwater range. Iron, however, is found in high concentrations in the groundwater because of its occurrence in the soil. Manganese is also

manganese, nickel, potassium, and vanadium. In the filtered sample, only the cadmium was outside the range for ambient groundwater and was four times less than the unfiltered sample.

EAMW-4 is located near Echo Bay and is influenced substantially by the tide. The following metals were detected in concentrations above the groundwater standard in this well: iron, magnesium, and sodium, with beryllium above the guidance value. The sodium concentrations for the second round sample was almost 1000 mg/l, suggesting saltwater intrusion in the well. Metals that were found in concentrations outside the range for ambient groundwater included aluminum in the second sampling round and calcium, lead, iron, potassium, and sodium in both sampling rounds.

At the other well located near Echo Bay, EAMW-5, two metals (iron and sodium) during the first round and three (iron, manganese, and sodium) during the second round were detected in concentrations exceeding groundwater standards. The sodium concentration in the first round sample was over 6000 mg/l, or over 0.5%. Beryllium concentrations also exceeded the guidance value of 3 µg/l in both sample rounds. The calcium, magnesium, potassium, and sodium concentrations were outside the range for ambient groundwater.

For the sample from the background well, EAMW-6, and its blind duplicate, three metals (iron, manganese, and sodium) in both rounds violated the groundwater standard. Metals in concentrations outside the ambient groundwater range included aluminum and chromium in all samples from this well; cadmium in only the blind duplicate samples; and iron and vanadium in the second round samples.

Cyanide was not found in any of the groundwater samples.

4.5.5 **Surface Water Data**

During the groundwater sampling program, one sample from Echo Bay (EAEBSW-1) was collected and analyzed for the same parameters as the groundwater to compare the concentrations in the bay to that in the groundwater. These results are provided on Table 4-20 and shown on Figure 4-21. Echo Bay is classified by the New York State Division of

SURFACE WATER DATA SUMMARY (JULY, SEPTEMBER, & DECEMBER 1992)

CON EDISON - Echo Avenue

PARAMETER	EAEBSW-1 Jul 92	MS EAEBSW-1 Jul 92	MSD EAEBSW-1 Jul 92	EAEBSW-1 Sep 92**	MS EAEBSW-1 Sep 92**	MSD EAEBSW-1 Sep 92**	EAEBSW-1 Dec 92**	RE EAEBSW-1 Dec 92**	MS EAEBSW-1 Dec 92**	MSD EAEBSW-1 Dec 92**	NYSDEC SW CLASS SB STANDARDS
VOLATILE ORGANICS (µg/l)											
cis-1,2-Dichloroethylene	ND	ND	ND	NU	NU	NU	4	3	ND	ND	NS
Vinyl chloride	ND	ND	ND	NU	NU	NU	0.9	0.8	ND	ND	NS
Tetrachloroethylene	ND	ND	ND	NU	NU	NU	0.5	ND	ND	ND	1 GV
Ethylbenzene	ND	ND	ND	NU	NU	NU	ND	0.19	ND	ND	NS
Tentatively Identified Compounds											
2-Propanone	ND	NR	NR	NU	NR	NR	2 j	ND	NR	NR	50
Unknown	ND	NR	NR	NU	NR	NR	2 j	2 j	NR	NR	50
SEMIVOLATILE ORGANICS (µg/l)											
Butylbenzylphthalate	7.5 j	ND	ND	ND	ND	ND	NR	NR	NR	NR	NS
bis(2-Ethylhexyl)phthalate	4.5 b j	ND	ND	20 b	39 b	56 b	NR	NR	NR	NR	NS
Tentatively Identified Compounds											
Unknown alcohol	5 j	NR	NR	ND	NR	NR	NR	NR	NR	NR	50 GV
Unknown	3 j	NR	NR	ND	NR	NR	NR	NR	NR	NR	50 GV
Dimethylethylphenol isomer	ND	NR	NR	3 j	NR	NR	NR	NR	NR	NR	50 GV
Unknown hydrocarbon	ND	NR	NR	5 j	NR	NR	NR	NR	NR	NR	50 GV
PESTICIDES/PCBs (µg/l)											-
Endrin ketone	ND	ND	ND	ND	ND	0.0099 j	NR	NR	NR	NR	NS
Endrin aldehyde	ND	ND	ND	ND	ND	0.012 j	NR	NR	NR	NR	NS

* - Pesticides/PCB samples were analyzed using low-level methods in accordance with NYSDEC CLP 12/91 protocol.
** - 9/92 and 12/92 volatile samples were analyzed using EPA low-level method 542.2.
b - Found in associated blanks.
j - Estimated concentration; compound present below quantitation limit.
GV - Guidance value.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
NR - Not run.
NS - No standard.
NU - Data not usable due to holding time violation.
RE - Re-analyzed sample.
MSD - Matrix spike duplicate.

Water Resources as a Class SB surface water; applicable standards are indicated in Table 4-20.

4.5.5.1 ***Volatile Organics***. No VOCs or TICs were detected in the first round sample. The holding time for the second round VOC sample was exceeded by the laboratory and, therefore, resampling for this fraction took place in December 1992. The second round of analyses and the resampling round were done using EPA Method 542.2 to achieve a lower detection limit. The resampled reanalyzed data showed low levels of cis-1,2-dichloroethylene (1,2-DCE) at 3 µg/l, vinyl chloride (VC) at 0.8 µg/l, and ethylbenzene (EB) at 0.19 µg/l. No surface water standards exist for any of these compounds. The fact that these same compounds were not detected in the groundwater on site, indicate that their presence in the bay water is not related to the site. An unknown TIC at a concentration of 2 µg/l was found in the sample.

4.5.5.2 ***Semivolatile Organics***. PAEs were found in both samples and include butyl-benzylphthalate (BBP) and B2EHP. The concentrations found were 7.5 µg/l of BBP in the first round and 4.5 and 20 µg/l of B2EHP in the first and second rounds, respectively. The MS and MSD samples from the second round also had 39 and 56 µg/l of B2EHP, respectively. B2EHP was also found in the associated blank, indicative of laboratory contamination. No standard exists for either of these compounds. Semivolatile TICs totaling 8 µg/l were found in both samples and consisted mostly of unknowns.

4.5.5.3 ***Pesticides/PCBs***. No pesticides or PCBs were detected in either of the samples; however, two pesticides, endrin ketone and endrin aldehyde, were detected at estimated concentrations of 0.0099 and 0.012 µg/l, respectively, in the MSD from the second round. There are no standards or guidance values for either of these compounds. The second round of analyses was done using a methodology to achieve a lower detection level.

4.5.5.4 ***Metals and Cyanide***. Copper, lead, and zinc were the only metals in the surface water samples that exceeded the Class SB standard. Copper exceeded the standard of 2.9 µg/l in both samples and the associated duplicates. Lead was not detected in the second round but exceeded the standard of 8.6 µg/l during the first round. Zinc was higher than the standard

of 58 µg/l for the first round and, although found in the second round, was not above the standard. Cadmium was found only in the duplicate from the second round; its concentration of 2.8 µg/l exceeded the guidance value of 2.7 µg/l for human consumption of fish.

The calcium, magnesium, potassium, and sodium concentrations found in the bay water are similar to those found in the groundwater, especially in the two wells along the shoreline, suggesting that the high concentrations of these metals in the groundwater are related to the tidal influence of the bay.

Cyanide was not found in either of the bay water samples.

4.5.6 **Sediment Data**

Sediment samples were collected and analyzed from 18 cores taken from Echo Bay. The samples were collected approximately 10 ft out from the high-water mark into Echo Bay during low tide and were taken at approximately 20-ft increments along the property boundary. The cores were driven to a depth of 2 ft, removed, and split into four equal segments at the LMS laboratory. Each segment represented a 6-in. depth of sediment and each segment was analyzed individually for PCBs. These samples are designated as EAEBSD- followed by a 6-in. sample interval. In addition, six drain pipes that enter Echo Bay from the property were sampled for sediments during low tide and were analyzed for PCBs. The drain pipe samples are designated as EADPSD-. Sediment samples were also collected from both sides of a double manhole (identified as No. 3) and analyzed for PCBs; these samples are designated as EAMHSD-3A and 3B. The sediment data are summarized in Table 4-21 and presented graphically in Figures 4-22 and 4-23. The analytical data reports are contained in Appendix G and the usability report is found in Appendix H.

4.5.6.1 ***PCBs.*** Drainage pipe and sediment core data are summarized on Figure 4-22. The results are discussed here even though the quantities of PCBs are not of substantial concern. Sediment in drainage pipes EADPSD-1 and EADPSD-3 had no detectable PCBs. All the remaining pipes had detectable levels of PCBs. PCB concentrations detected in the sediments from the drain pipes included EADPSD-2, 0.028 mg/kg (and 0.051 mg/kg for the duplicate);

TABLE 4-21 (Page 1 of 5)

SEDIMENT SAMPLES DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EADPSD-1	EADPSD-2	DUP EADPSD-2	MS EADPSD-2	MSD EADPSD-2	EADPSD-3	EADPSD-4	EADPSD-5	DUP EADPSD-5	MS EADPSD-5	MSD EADPSD-5
PCBs (mg/kg)											
Aroclor 1254	ND	0.010 j p	0.031 j	0.033 p	0.043 p	ND	0.096	0.021 j	0.060	0.073	0.230
Aroclor 1260	ND	0.018 p	0.020 j p	●	●	ND	0.054	0.013 j	0.034	●	●

PARAMETER	EADPSD-6	EAEBSD-1 (0-6 in.)	EAEBSD-1 (6-12 in.)	EAEBSD-1 (12-18 in.)	EAEBSD-1 (18-24 in.)	EAEBSD-2 (0-6 in.)	EAEBSD-2 (6-12 in.)	EAEBSD-2 (12-18 in.)	EAEBSD-2 (18-24 in.)
PCBs (mg/kg)									
Aroclor 1016	ND	*	*	ND	ND	ND	ND	ND	ND
Aroclor 1242	ND	0.028 * j p	0.035 * j p	ND	ND	ND	ND	ND	ND
Aroclor 1254	0.560	0.220 p	0.240 p	ND	ND	0.021 j	ND	ND	ND
Aroclor 1260	0.230	ND	0.085	ND	ND	ND	ND	ND	ND

● - Spiking compound; data not representative of actual sample concentration.
* - Reflects a sum of the flagged aroclors.
j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB target analyte has >25% difference for the detected concentrations between the two GC columns.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
DUP - Duplicate sample analysis.
MSD - Matrix spike duplicate.

TABLE 4-21 (Page 2 of 5)

SEDIMENT SAMPLES DATA SUMMARY (JULY 1992)
CON EDISON - Echo Avenue

PARAMETER	EAEBSD-3 (0-6 in.)	EAEBSD-3 (6-12 in.)	EAEBSD-3 (12-18 in.)	EAEBSD-3 (18-24 in.)	EAEBSD-4 (0-6 in.)	EAEBSD-4 (6-12 in.)	EAEBSD-4 (12-18 in.)	EAEBSD-4 (18-24 in.)
PCBs (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND

PARAMETER	EAEBSD-5 (0-6 in.)	EAEBSD-5 (6-12 in.)	EAEBSD-5 (12-18 in.)	EAEBSD-5 (18-24 in.)	EAEBSD-6 (0-6 in.)	EAEBSD-6 (6-12 in.)	EAEBSD-6 (12-18 in.)	EAEBSD-6 (18-24 in.)
PCBs (mg/kg)								
Aroclor 1254	0.024 j	ND	ND	ND	ND	ND	ND	0.032 j
Aroclor 1260	0.025 j	ND	ND	ND	ND	ND	ND	ND

j - Estimated concentration; compound present below quantitation limit.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

SEDIMENT SAMPLES DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAEBSD-7 (0-6 in.)	EAEBSD-7 (6-12 in.)	EAEBSD-7 (12-18 in.)	EAEBSD-7 (18-24 in.)	EAEBSD-8 (0-6 in.)	EAEBSD-8 (6-12 in.)	EAEBSD-8 (12-18 in.)	EAEBSD-8 (18-24 in.)	EAEBSD-9 (0-6 in.)	EAEBSD-9 (6-12 in.)
PCBs (mg/kg)										
Aroclor 1254	ND	ND	0.030 j p	0.057	ND	ND	0.045 j p	ND	ND	ND
Aroclor 1260	ND	ND	0.034 j	0.054	ND	ND	0.051 j p	ND	ND	ND

PARAMETER	EAEBSD-9 (12-18 in.)	EAEBSD-9 (18-24 in.)	EAEBSD-10 (0-6 in.)	EAEBSD-10 (6-12 in.)	EAEBSD-10 (12-18 in.)	MS EAEBSD-10 (12-18 in.)	MSD EAEBSD-10 (12-18 in.)	EAEBSD-10 (18-24 in.)
PCBs (mg/kg)								
Aroclor 1254	ND	ND	*	ND	ND	ND	ND	ND
Aroclor 1260	ND	ND	0.014 * j	ND	ND	●	●	ND

● - Spiking compound; data not representative of actual sample concentration.
* - Reflects a sum of the flagged aroclors.
j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB target analyte has >25% difference for the detected concentrations between the two GC columns.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.
MSD - Matrix spike duplicate.

SEDIMENT SAMPLES DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAEBSD-11 (0-6 in.)	EAEBSD-11 (6-12 in.)	EAEBSD-11 (12-18 in.)	EAEBSD-11 (18-24 in.)	EAEBSD-12 (0-6 in.)	EAEBSD-12 (6-12 in.)	EAEBSD-12 (12-18 in.)	EAEBSD-12 (18-24 in.)
PCBs (mg/kg)								
Aroclor 1254	ND	ND	ND	ND	0.130 p	ND	ND	ND

PARAMETER	EAEBSD-13 (0-6 in.)	EAEBSD-13 (6-12 in.)	EAEBSD-13 (12-18 in.)	EAEBSD-13 (18-24 in.)	EAEBSD-14 (0-6 in.)	EAEBSD-14 (6-12 in.)	EAEBSD-14 (12-18 in.)	EAEBSD-14 (18-24 in.)
PCBs (mg/kg)								
Aroclor 1242	ND	0.084	0.039 j p	ND	ND	ND	ND	ND
Aroclor 1254	0.059	0.045	0.140	0.130	0.230	0.048 j	ND	ND
Aroclor 1260	0.040 j	0.047	0.140	0.098	ND	ND	ND	ND

j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB target analyte has >25% difference for the detected concentrations between the two GC columns.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

SEDIMENT SAMPLES DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAEBSD-15 (0-6 in.)	EAEBSD-15 (6-12 in.)	EAEBSD-15 (12-18 in.)	EAEBSD-15 (18-24 in.)	EAEBSD-16 (0-6 in.)	EAEBSD-16 (6-12 in.)	EAEBSD-16 (12-18 in.)	EAEBSD-16 (18-24 in.)	EAEBSD-17 (0-6 in.)	FIELD BLANK-1	FIELD BLANK-2
PCBs (mg/kg)											
Aroclor 1254	0.130	0.031 j	ND	ND	0.065	0.130	0.120	0.120	0.140 p	ND	ND
Aroclor 1260	0.081	ND	ND	ND	0.032 j p	0.083	0.114	0.074	ND	ND	ND

PARAMETER	EAEBSD-17 (6-12 in.)	EAEBSD-17 (12-18 in.)	EAEBSD-17 (18-24 in.)	EAEBSD-18 (0-6 in.)	EAEBSD-18 (6-12 in.)	EAEBSD-18 (12-18 in.)	EAEBSD-18 (18-24 in.)	EAMHSD-3A	EAMHSD-3B	FIELD BLANK-1	FIELD BLANK-2
PCBs (mg/kg)											
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	*	*	ND	ND
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	0.180 *	1.80 *	ND	ND
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	2.50	9.20	ND	ND
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	0.50	1.70	ND	ND

* - Reflects a sum of the flagged aroclors.
j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB target analyte has >25% difference for the detected concentrations between the two GC columns.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

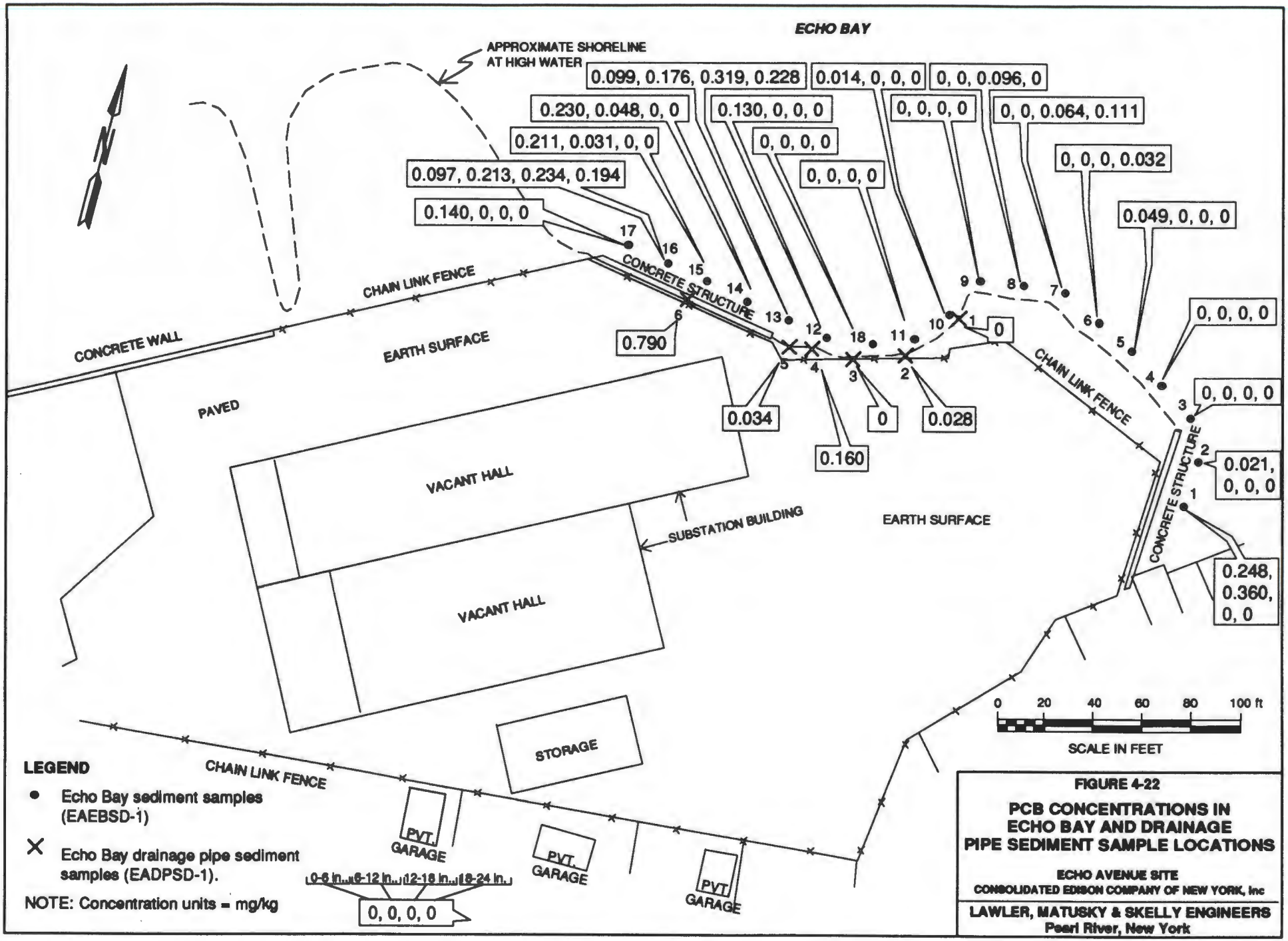


FIGURE 4-22

PCB CONCENTRATIONS IN ECHO BAY AND DRAINAGE PIPE SEDIMENT SAMPLE LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

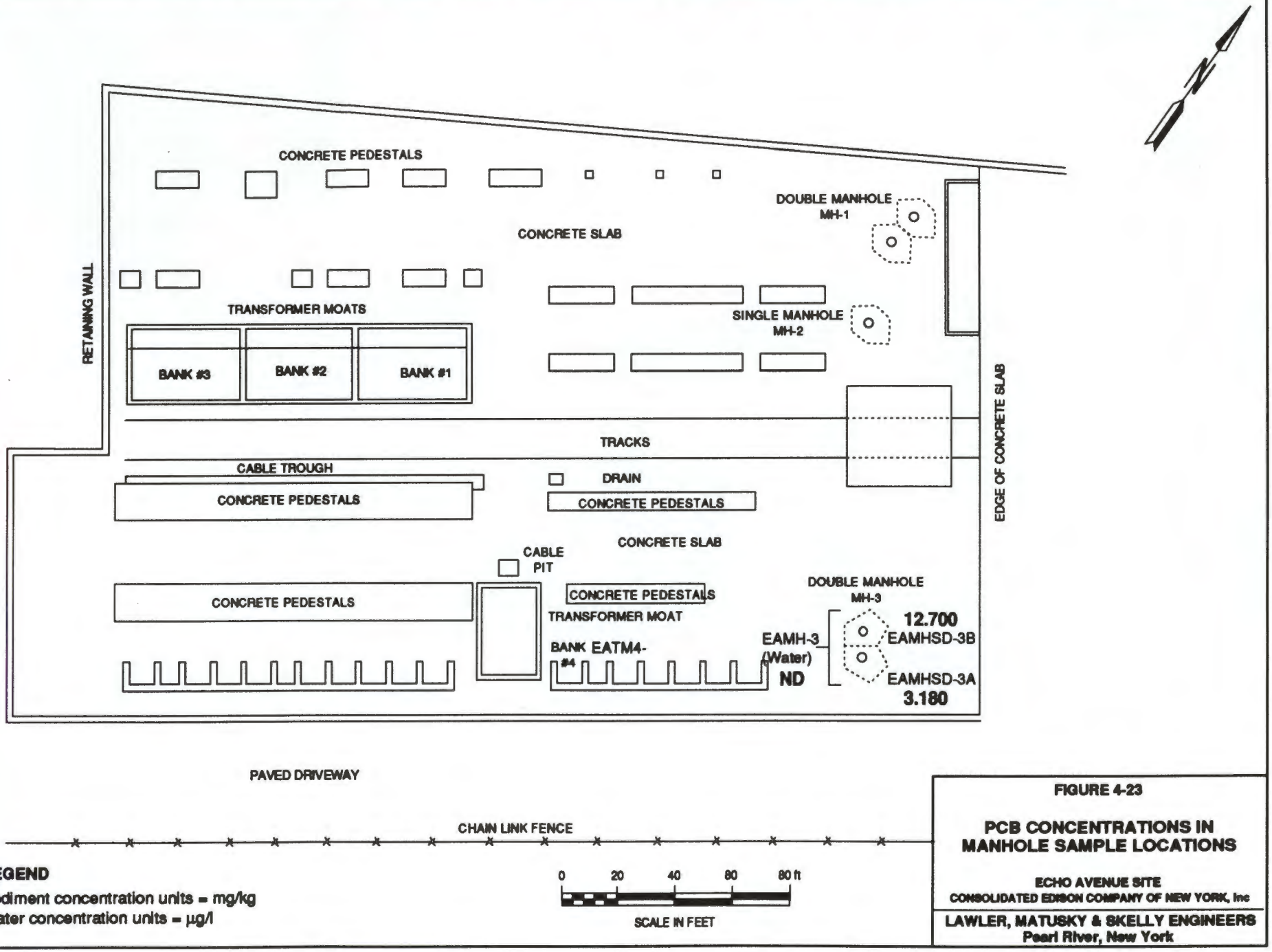


FIGURE 4-23

PCB CONCENTRATIONS IN MANHOLE SAMPLE LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

EADPSD-4, 0.150 mg/kg; EADPSD-5, 0.034/0.094 mg/kg; and EADPSD-6, 0.790 mg/kg. Although no cleanup standards exist for sediment, NYSDEC classifies waste material from the dredging of the Hudson River, streams, lakes, and ponds as nonhazardous industrial waste if the material has concentrations of PCBs from 5 to 50 mg/kg and as construction and demolition debris if the concentration of PCBs are <5 mg/kg (Ref. 24, Appendix A). Using these characterizations, all of these sediments would be considered to be construction and demolition debris.

The sediment core samples were collected in Echo Bay from the concrete bulkhead on the eastern end of the property to the end of the concrete bulkhead on the western end of the bay. Core sample EAEBSD-18 was taken half way between samples EAEBSD-11 and -12. EAEBSD-1 had a total concentration of 0.248 mg/kg of PCBs in the 0- to 6-in. interval and 0.360 mg/kg in the 6- to 12-in. interval, with no detectable PCBs in the 12- to 18-in. or 18- to 24-in. intervals. The next sample, EAEBSD-2, had only 0.021 mg/kg of PCBs in the 0- to 6-in. interval and none detected in the other sample intervals. EAEBSD-3 and -4 had no detectable PCBs in any of the samples. EAEBSD-5 had a concentration 0.049 mg/kg of PCBs in the 0- to 6-in. sample, with none detected in the rest of the sample intervals; EAEBSD-6 had a concentration of 0.032 mg/kg PCBs in the 18- to 24-in. interval and none detected in the rest of the sample. Sample EAEBSD-7 had no detectable PCBs in the first two depth intervals but had 0.064 and 0.111 mg/kg PCBs in the bottom two depth intervals. The next sediment core taken, EAEBSD-8, had only 0.096 mg/kg of PCBs in the 12- to 18-in. interval and none detected in the remaining depth samples. No detectable PCBs were found in sample EAEBSD-9, and only 0.014 mg/kg of PCBs were detected in the sample from EAEBSD-10 at the 0- to 6-in. interval. EAEBSD-11 and EAEBSD-18 had no detectable PCBs; however, EAEBSD-12 had 0.130 mg/kg of PCBs in the 0- to 6-in. interval. Sediment core EAEBSD-13 had the highest detected concentrations of PCBs in any of the cores, with 0.099 mg/kg in the 0- to 6-in. interval, 0.176 mg/kg in the 6- to 12-in. interval, 0.319 mg/kg in the 12- to 18-in. interval, and 0.228 mg/kg in the 18- to 24-in. interval. The next core, EAEBSD-14, had 0.230 mg/kg of PCBs in the top sample interval and 0.048 mg/kg in the next depth interval. Sample EAEBSD-15 had 0.211 mg/kg of PCBs in the 0- to 6-in. interval, 0.031 mg/kg in the 6- to 12-in. interval, and none detected in the other two depth intervals. EAEBSD-16 had detectable quantities of PCBs in all four sample intervals including 0.097

mg/kg in the 0- to 6-in. interval, 0.213 mg/kg in the 6- to 12-in. interval, 0.234 mg/kg in the 12- to 18-in. interval, and 0.194 mg/kg in the 18- to 24-in. interval. Sample EAEBSD-17 had only 0.140 mg/kg of PCBs in the 0- to 6-in. interval and none in the remaining depth samples.

All of the bay sediment samples analyzed had concentrations below 0.4 mg/kg. One sample taken from inside a drain pipe had almost 0.8 mg/kg of PCBs. As all results are well below 5 mg/kg total PCBs from the four intervals, the site sediment would be considered construction and demolition debris by NYSDEC. EPA would consider the sediments "clean" (40 CFR 761.125) as concentrations are below 1 mg/kg (Ref. 14, Appendix A). Most of the PCB contamination appeared to be in the top (0- to 6-in.) interval; however, the highest concentration was found in the 18- 24-in. interval at EAEBSD-13. EAEBSD-13 is situated near and off-shore of drainage pipe EADPSD-4, which had a total of 0.150 mg/kg of PCBs in its sediment sample. Nevertheless, the drainage pipes do not appear to be a significant source of PCBs to Echo Bay and the bay sediments do not have high quantities of PCBs at depth. The PCBs in the sediment may, in fact, be at background concentrations.

The double manhole, MH-3, is located in the eastern corner of the outdoor transformer yard; results of the sampling of the sediment from this manhole are shown on Figure 4-23. The sediment sample from the southern portion of the double manhole, designated as EAMHSD-3A, had a total concentration of 3.180 mg/kg of PCBs, which is less than the 5.0 mg/kg used by NYSDEC to classify materials as construction and demolition debris. The other side of the manhole, EAMHSD-3B, had a total concentration of 12.70 mg/kg of PCBs, which is within the concentration range used by NYSDEC to classify materials as nonhazardous industrial waste.

A water sample was also collected from inside the double manhole. The analytical data from this sample are provided on Table 4-22 and the results are shown on Figure 4-23. No PCBs were detected in this water sample.

TABLE 4-22

MANHOLE SAMPLE DATA SUMMARY (JULY 1992)
CON EDISON - Echo Avenue

PARAMETER	EAMH-3
PCBs (µg/l)	ND

ND - Not detected at analytical detection limit;
see Appendix G for detection limit.

4.5.7 **Concrete Core Data**

Twenty concrete core samples were collected from each of four transformer moats in the outdoor transformer area. In each transformer moat five separate concrete cores were collected and analyzed for PCBs; these samples are designated as EATM- . Twenty other concrete cores were taken in stained areas throughout the outdoor transformer areas and also analyzed for PCBs; these samples are designated as EATAS-. A fifth transformer moat was found in the outdoor transformer area during sample collection. Three additional samples, two concrete cores and one shallow soil sample, were collected from this fifth transformer moat. The concrete core samples from this transformer moat are designated as EATM5- and the shallow soil is designated as EATM5-SS. The analytical results from the shallow soil sample, EATM5-SS, have been previously discussed in Section 4.5.3. The results of the concrete core samples are contained in Table 4-23 and presented graphically on Figures 4-24 and 4-25. The results of the concrete core sampling are discussed in detail in this section even though the quantities of PCBs are not of substantial concern. The analytical data reports are contained in Appendix G and the usability reports are in Appendix H.

4.5.7.1 ***PCBs***. The analytical results for the concrete cores from stained areas are presented on Figure 4-24. Concrete core samples EATAS-1, -2, -3, -17, and -18 were collected from columns in the southern area of the outdoor transformer yard. With the exception of EATAS-3, none of these five samples had detectable levels of PCBs. EATAS-3 had a total concentration of 0.500 mg/kg of PCBs. Samples EATAS-4, -5, and -16 were collected from the outside north wall, inside east wall, and outside east wall of transformer moat No. 4. These three samples had concentrations of 0.179, 0.180, and 0.053 mg/kg of total PCBs, respectively. Samples EATAS-6, -8, and -20 were collected from the inside north wall, the wall on the south side of the pit, and from the wall on the south side of the pit, at or adjacent to transformer moat No. 1, respectively. The results from these three samples showed concentrations of PCBs of 0.123, 0.110, and 0.0 mg/kg in EATAS-6, -8, and -20, respectively. Concrete core samples EATAS-7, -10, -11, 12, and -19 were taken from the inside north wall, the wall on south side of the pit the wall on the south side of the pit, the outside west wall, and the inside north wall, in or adjacent to transformer moat No. 3, respectively. The total concentrations of PCBs in each of these five samples were 0.167 mg/kg in EATAS-7, 0.098

TABLE 4-23 (Page 1 of 2)

CONCRETE SAMPLES DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EATAS-1	EATAS-2	EATAS-3	EATAS-4	EATAS-5	EATAS-6	EATAS-7	EATAS-8	EATAS-9
PCBs (mg/kg)									
Aroclor 1254	ND	ND	0.260	0.095 p	0.096	0.047	0.120 p	0.058	0.800
Aroclor 1260	ND	ND	0.240	0.084	0.084	0.076	0.047	0.052	0.130 p

PARAMETER	EATAS-10	EATAS-11	EATAS-12	EATAS-13	EATAS-14	EATAS-15	EATAS-16	EATAS-17	EATAS-18
PCBs (mg/kg)									
Aroclor 1254	0.075	0.034	ND	ND	ND	0.057	0.034	ND	ND
Aroclor 1260	0.023 j p	ND	ND	ND	ND	ND	0.019 j	ND	ND

PARAMETER	EATAS-19	EATAS-20	EATM1-1	EATM1-2	EATM1-3	EATM1-4	EATM1-5	EATM2-1	DL EATM2-1
PCBs (mg/kg)									
Aroclor 1254	0.130	ND	0.190 p	0.031 j	0.045 j	0.054 j	0.026 j	3.70 e	6.80 p
Aroclor 1260	0.039 p	ND	0.065	0.024 j	0.051	0.066	0.013 j	0.440 p	0.270 j p

j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB target analyte has >25% difference for the detected concentrations between the two GC columns.
DL - Diluted sample analysis; see Appendix G for dilution factor.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

CONCRETE SAMPLES DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EATM2-2	EATM2-3	EATM2-4	EATM2-5	EATM3-1	EATM3-2	EATM3-3	EATM3-4	EATM3-5
PCBs (mg/kg)									
Aroclor 1242	ND	ND	ND	ND	ND	0.045	ND	ND	ND
Aroclor 1254	0.730 p	0.210	0.310	0.420	0.013 j p	0.110	0.062	0.098	0.050
Aroclor 1260	0.110	0.022 j p	0.030 j	0.035 p	ND	0.026 j	0.048 p	ND	ND

PARAMETER	EATM4-1	EATM4-2	EATM4-3	EATM4-4	EATM4-5	EATM5-1	EATM5-2	FIELD BLANK 6 (µg/l)	FIELD BLANK 7 (µg/l)
PCBs (mg/kg)									
Aroclor 1254	0.120	0.058	0.032 j	0.062 p	0.031 j	0.290 p	ND	ND	ND
Aroclor 1260	0.034	0.047	0.007 j	0.045	ND	0.900	ND	ND	ND

j - Estimated concentration; compound present below quantitation limit.
p - Estimated concentration; pesticide/PCB target analyte has >25% difference for the detected concentrations between the two GC columns.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

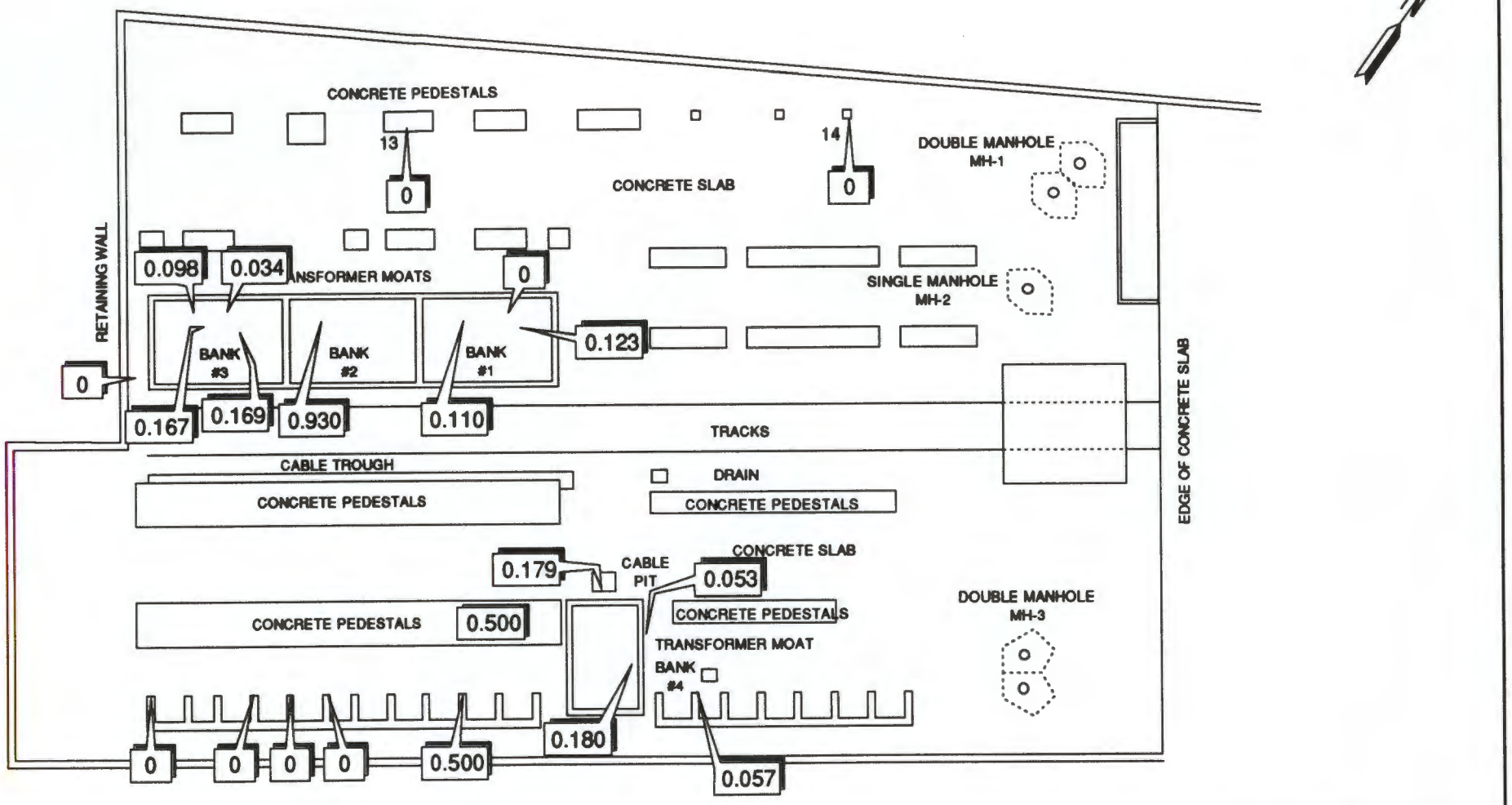


FIGURE 4-24

PCB CONCENTRATIONS IN TRANSFOMER AREA STAINS CONCRETE CORE SAMPLE LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

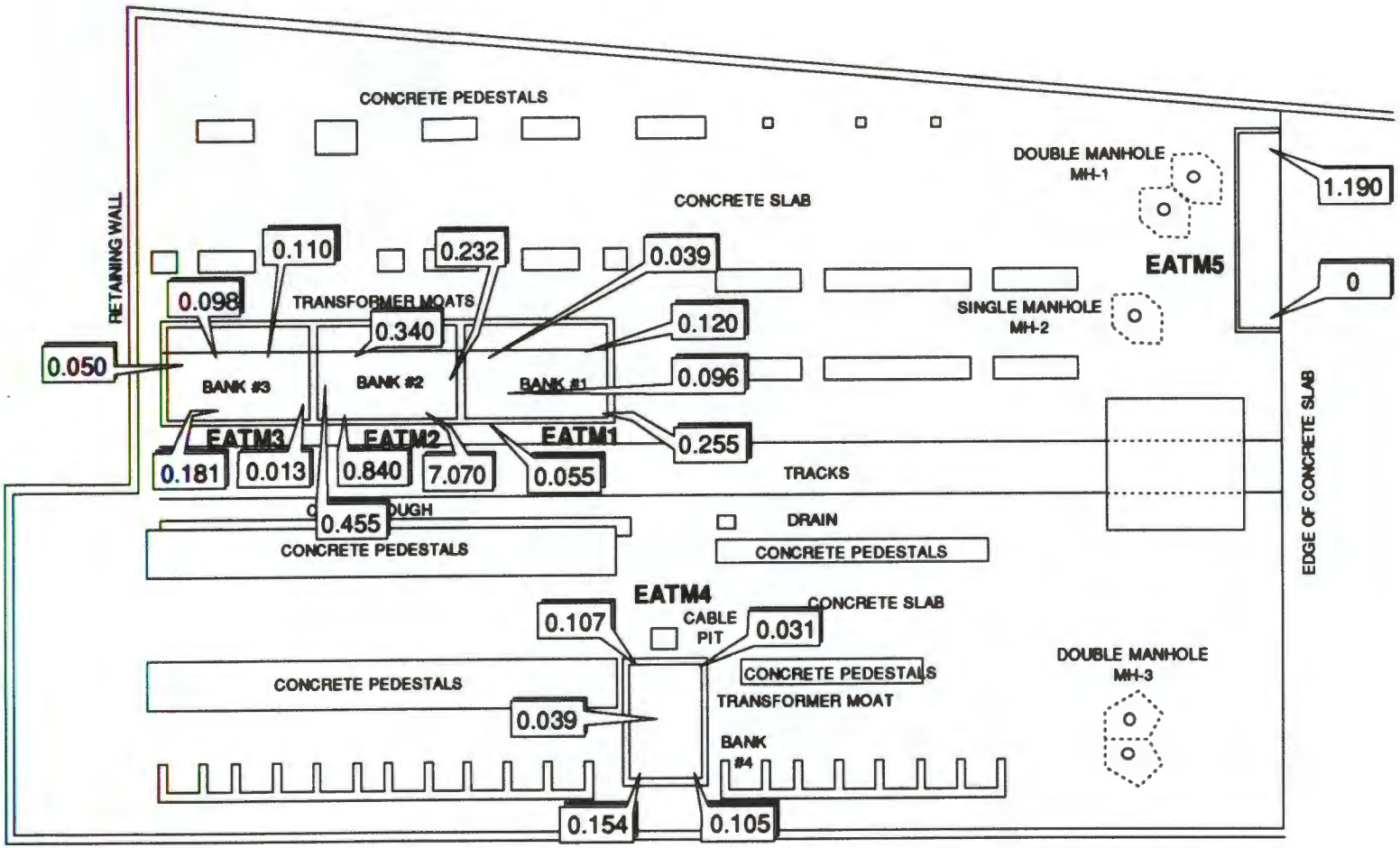


FIGURE 4-25

PCB CONCENTRATIONS IN TRANSFOMER MOAT CONCRETE CORE SAMPLE LOCATIONS

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

mg/kg in EATAS-10, 0.034 mg/kg in EATAS-11, ND in EATAS-12, and 0.169 mg/kg in EATAS-19. Sample EATAS-9 was taken from the wall on the south side of the pit adjacent to transformer moat No. 2 and had a concentration of 0.930 mg/kg of PCBs. EATAS-13 was collected from a concrete platform located behind transformer moat No. 2 and had no detectable concentrations of PCBs. EATAS-14, which also had no detectable concentrations of PCBs, was taken at a column along the property wall. Sample EATAS-15 was collected from a platform in front of the columns on the eastern part of the transformer yard and had a concentration of 0.057 mg/kg of PCBs.

The analytical results for the remaining concrete cores from the transformer moats are shown on Figure 4-25. Five concrete core samples were collected from the floor of transformer moat No. 1. The five samples (EATM1-1 to -5) had PCB concentrations of 0.255, 0.055, 0.096, 0.120, and 0.039 mg/kg, respectively. In transformer moat No. 2, five samples were also collected from the floor. The PCB results of these five samples (EATM2-1 to -5) were 7.070, 0.840, 0.232, 0.340, and 0.455 mg/kg, respectively. In transformer moat No. 3, five samples, designated as EATM3-1 to -5, were collected and analyzed for PCBs; results were 0.013, 0.181, 0.110, 0.098, and 0.050 mg/kg of total PCBs, respectively. Five samples were also collected from transformer moat No. 4 (EATM4-1 to -5); PCB concentrations were 0.154, 0.105, 0.039, 0.107, and 0.031 mg/kg, respectively. Two additional samples were collected from transformer moat No. 5 and designated as EATM5-1 and -2. These last two sampled had PCB concentrations of 1.190 mg/kg and ND, respectively.

None of the concrete core samples contained PCBs in concentrations above 10 mg/kg, the soil EPA cleanup level for substations in residential areas. Although concrete is not soil, the comparison provides a method to determine the contamination of the concrete cores. With the exception of samples EATM2-1 and EATM5-1, none the samples had a PCB concentration that exceeded 1 mg/kg. With the exception of EATM3-2, the Aroclors detected included 1254 and 1260; EATM3-2 also had Aroclor 1242.

4.5.8 **Wipe Sample Data**

A total of 239 wipe samples were collected from various sections of the substation building and analyzed for PCBs. The results are summarized in Table 4-24 and presented graphically in Figures 4-26 to 4-31. The analytical data reports are contained in Appendix G and the usability report is in Appendix H. Although all samples were initially analyzed at a detection limit of 1 $\mu g/100\ cm^2$, some had to be diluted for the sample concentration to be within the calibration range of the instrument; therefore, some results are estimated and the detection limit varies. The following paragraphs describe the analytical results for each of the individual areas within the substation building that were sampled.

4.5.8.1 ***North Hall.*** A total of 40 wall wipes and 19 floor wipes were collected in the North Hall. Wall wipes were collected at approximately 20-ft lateral increments and at a height of 2 and 8 ft above the floor. No samples were collected along a 100-ft-long section of the eastern portion of the northern wall due to its deteriorated condition. Likewise, no floor samples were collected within 15 ft of this same wall. Figure 4-26 presents the data collected from the wall wipes and Figure 4-27 presents the data from the floor wipes in the North Hall. Table 4-24 contains the data with samples labeled EAWNH-, indicating a wall wipe from the North Hall and samples labeled EAFWNH-, a floor wipe from the North Hall.

None of the wall samples had detectable levels of PCBs. Sixteen of the 19 floor wipes had detectable concentrations of PCBs consisting of Aroclor 1254 and 1260, congeners commonly associated with transformer oils containing PCBs. The PCB concentrations of these 16 floor wipes ranged from 1.0 to 37 $\mu g/100\ cm^2$. The highest PCB concentrations detected were in the southwest portion of the building, where results ranged from 5.3 to 37 $\mu g/100\ cm^2$. Only two of the samples, EAFWNH-3 and -4, exceeded the 10-$\mu g/100\text{-}cm^2$ EPA cleanup level for nonrestricted access areas.

4.5.8.2 ***South Hall.*** Thirty-four wipe samples were collected from the walls of the South Hall; these samples are designated as EAWSH- in Table 4-24 and are shown graphically on Figure 4-26. Samples were collected approximately 20 ft apart laterally and at 2 and 8 ft above the ground. Nineteen wipe samples were collected from the floor in the South Hall. These

TABLE 4-24 (Page 1 of 6)

WIPE SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAWNH-1 (2 ft)	EAWNH-1 (8 ft)	EAWNH-2 (2 ft)	EAWNH-2 (8 ft)	EAWNH-3 (2 ft)	EAWNH-3 (8 ft)	EAWNH-4 (2 ft)	EAWNH-4 (8 ft)	EAWNH-5 (2 ft)	EAWNH-5 (8 ft)	EAWNH-6 (2 ft)	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAWNH-6 (8 ft)	EAWNH-7 (2 ft)	EAWNH-7 (8 ft)	EAWNH-8 (2 ft)	EAWNH-8 (8 ft)	MS EAWNH-8 (8 ft)	EAWNH-9 (2 ft)	EAWNH-9 (8 ft)	EAWNH-10 (2 ft)	EAWNH-10 (8 ft)	EAWNH-11 (2 ft)	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAWNH-11 (8 ft)	EAWNH-12 (2 ft)	EAWNH-12 (8 ft)	EAWNH-13 (2 ft)	EAWNH-13 (8 ft)	EAWNH-14 (2 ft)	EAWNH-14 (8 ft)	EAWNH-15 (2 ft)	EAWNH-15 (8 ft)	EAWNH-16 (2 ft)	EAWNH-16 (8 ft)	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAWNH-17 (2 ft)	EAWNH-17 (8 ft)	EAWNH-18 (2 ft)	EAWNH-18 (8 ft)	EAWNH-19 (2 ft)	EAWNH-19 (8 ft)	EAWNH-20 (2 ft)	EAWNH-20 (8 ft)	MS EAWNH-20 (8 ft)	EAW FIELD BLANK-1	EAW FIELD BLANK-2	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

^ - Reference 14, Appendix A; cleanup level is for total PCBs.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

WIPE SAMPLE DATA SUMMARY (JULY 1992)
CON EDISON - Echo Avenue

PARAMETER	EAFWNH-1	EAFWNH-2	EAFWNH-3	EAFWNH-4	EAFWNH-5	EAFWNH-6	EAFWNH-7	MS EAFWNH-7	EAFWNH-8	EAFWNH-9	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)											
Aroclor 1254	5.3 *	5.1 j *	32 *	37 *	10 *	1.7 *	7.7 j *	•	1.4 *	1.4 *	10
Aroclor 1260	*	*	*	*	*	*	*	ND	*	*	10

PARAMETER	EAFWNH-10	EAFWNH-11	EAFWNH-12	EAFWNH-13	EAFWNH-14	EAFWNH-15	EAFWNH-16	EAFWNH-17	EAFWNH-18	EAFWNH-19	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)											
Aroclor 1254	3.4 j *	2.5 *	ND	ND	3.4 *	1.0 j *	1.8 j *	ND	1.6 j *	1.9 *	10
Aroclor 1260	*	*	ND	ND	*	*	*	ND	*	*	10

PARAMETER	EAWSH-1 (2 ft)	EAWSH-1 (6 ft)	EAWSH-2 (2 ft)	EAWSH-2 (6 ft)	EAWSH-3 (2 ft)	EAWSH-3 (6 ft)	EAWSH-4 (2 ft)	EAWSH-4 (6 ft)	EAWSH-5 (2 ft)	EAWSH-5 (6 ft)	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAWSH-6 (2 ft)	EAWSH-6 (6 ft)	EAWSH-7 (2 ft)	EAWSH-7 (6 ft)	EAWSH-8 (2 ft)	EAWSH-8 (6 ft)	EAWSH-9 (2 ft)	EAWSH-9 (6 ft)	EAWSH-10 (2 ft)	EAWSH-10 (6 ft)	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)											
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	0.6 j *	0.5 j *	10
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	ND	*	*	10

^ - Reference 14, Appendix A; cleanup level is for total PCBs.
* - Reflects the sum of the flagged Aroclors.
• - Spiking compound; data not representative of actual sample concentration.
j - Estimated concentration; compound present below quantitation limit.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

TABLE 4-24 (Page 3 of 6)

WIPE SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAWSH-11 (2 ft)	EAWSH-11 (8 ft)	EAWSH-12 (2 ft)	EAWSH-12 (8 ft)	EAWSH-13 (2 ft)	EAWSH-13 (8 ft)	EAWSH-14 (2 ft)	EAWSH-14 (8 ft)	EAWSH-15 (2 ft)	EAWSH-15 (8 ft)	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)											
Aroclor 1254	0.6 j *	1.2 *	0.8 j *	ND	ND	ND	ND	ND	ND	ND	10
Aroclor 1260	*	*	*	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAWSH-16 (2 ft)	EAWSH-16 (8 ft)	EAWSH-17 (2 ft)	EAWSH-17 (8 ft)	EAFWSH-1	EAFWSH-2	EAFWSH-3	EAFWSH-4	EAFWSH-5	EAFWSH-6	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)											
Aroclor 1254	ND	ND	ND	ND	0.8 j *	ND	2.5 *	2.8 *	3.4 *	5.6 *	10
Aroclor 1260	ND	ND	ND	ND	*	ND	*	*	*	*	10

PARAMETER	MS EAFWSH-6	EAFWSH-7	EAFWSH-8	EAFWSH-9	EAFWSH-10	EAFWSH-11	EAFWSH-12	EAFWSH-13	EAFWSH-14	EAFWSH-15	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)											
Aroclor 1254	•	1.3 *	3.7 *	5.9 *	4.9 *	0.7 j *	0.6 j *	2 j *	15 *	1.1 *	10
Aroclor 1260	ND	*	*	*	*	*	*	*	*	*	10

PARAMETER	EAWFSH-16	EAWFSH-17	EAWFSH-18	EAWFSH-19	EAWB-1 (2 ft)	EAWB-1 (8 ft)	EAWB-2 (2 ft)	EAWB-2 (8 ft)	EAWB-3 (2 ft)	EAWB-3 (8 ft)	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)											
Aroclor 1254	1.5 *	2.5 *	39 *	34 *	ND	ND	ND	ND	ND	ND	10
Aroclor 1260	*	*	*	*	ND	ND	ND	ND	ND	ND	10

^ - Reference 14, Appendix A; cleanup level is for total PCBs.
* - Reflects the sum of the flagged Aroclors.
• - Spiking compound; data not representative of actual sample concentration.
j - Estimated concentration; compound present below quantitation limit.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

TABLE 4-24 (Page 4 of 6)

WIPE SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAWB-4 (2 ft)	EAWB-4 (8 ft)	EAWB-5 (2 ft)	EAWB-5 (8 ft)	EAWB-6 (2 ft)	EAWB-6 (8 ft)	MS EAWB-6 (8 ft)	EAWB-7 (2 ft)	EAWB-7 (8 ft)	EAWB-8 (2 ft)	EAWB-8 (8 ft)	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)												
Aroclor 1254	ND	ND	ND	ND	2.8 *	ND	•	ND	ND	ND	ND	10
Aroclor 1260	ND	ND	ND	ND	*	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAWB-9 (2 ft)	EAWB-9 (8 ft)	EAWB-10 (2 ft)	EAWB-10 (8 ft)	EAWB-11 (2 ft)	EAWB-11 (8 ft)	EAWB-12 (2 ft)	EAWB-12 (8 ft)	EAWB-13 (2 ft)	EAWB-13 (8 ft)	EAWB-14 (2 ft)	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)												
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAWB-14 (8 ft)	EAWB-15 (2 ft)	EAWB-15 (8 ft)	EAWB-16 (2 ft)	MS EAWB-16 (2 ft)	EAWB-16 (8 ft)	EAWB-17 (2 ft)	EAWB-17 (8 ft)	EAWB-18 (2 ft)	EAWB-18 (8 ft)	EAWB-19 (2 ft)	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)												
Aroclor 1254	ND	1.9 j *	ND	1.2 *	•	ND	ND	ND	ND	ND	ND	10
Aroclor 1260	ND	*	ND	*	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAWB-19 (8 ft)	EAWB-20 (2 ft)	EAWB-20 (8 ft)	EAWB-21 (2 ft)	EAWB-21 (8 ft)	EAWBSR-1	EAWBSR-2	EAWBSR-3	EAWBSR-4	EAWBSR-5	EAWMR-1	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)												
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.6 *	ND	10
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	ND	ND	*	ND	10

^ - Reference 14, Appendix A; cleanup level is for total PCBs.
* - Reflects the sum of the flagged Aroclors.
• - Spiking compound; data not representative of actual sample concentration.
j - Estimated concentration; compound present below quantitation limit.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

WIPE SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

PARAMETER	EAWMR-2	EAWMR-3	EAWMR-4	EAWMR-5	MS EAWMR-5	EAWBR-1	EAWBR-2	EAWBR-3	EAWBR-4	EAWBR-5	EAWWR-1	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)												
Aroclor 1254	ND	ND	ND	0.86 j *	•	ND	ND	ND	ND	2.1*	ND	10
Aroclor 1260	ND	ND	ND	*	ND	ND	ND	ND	ND	*	ND	10

PARAMETER	EAWWR-2	EAWWR-3	EAWWR-4	EAWWR-5	EAWAR-1	EAWAR-2	EAWAR-3	EAWAR-4	EAWAR-5	EAWMO-1	EAWMO-2	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAWMO-3	EAWMO-4	EAWMO-5	EAWNO-1	EAWNO-2	EAWNO-3	MS EAWNO-3	EAWNO-4	EAWNO-5	EAWCR-1	EAWCR-2	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAWCR-3	EAWCR-4	EAWCR-5	MS EAWCR-5	EAWUO-1	EAWUO-2	EAWUO-3	EAWUO-4	EAWUO-5	EAWEB-1	EAWEB-2	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

^ - Reference 14, Appendix A; cleanup level is for total PCBs.
* - Reflects the sum of the flagged Aroclors.
• - Spiking compound; data not representative of actual sample concentration.
j - Estimated concentration; compound present below quantitation limit.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.

TABLE 4-24 (Page 6 of 6)

WIPE SAMPLE DATA SUMMARY (JULY 1992)

CON EDISON - Echo Avenue

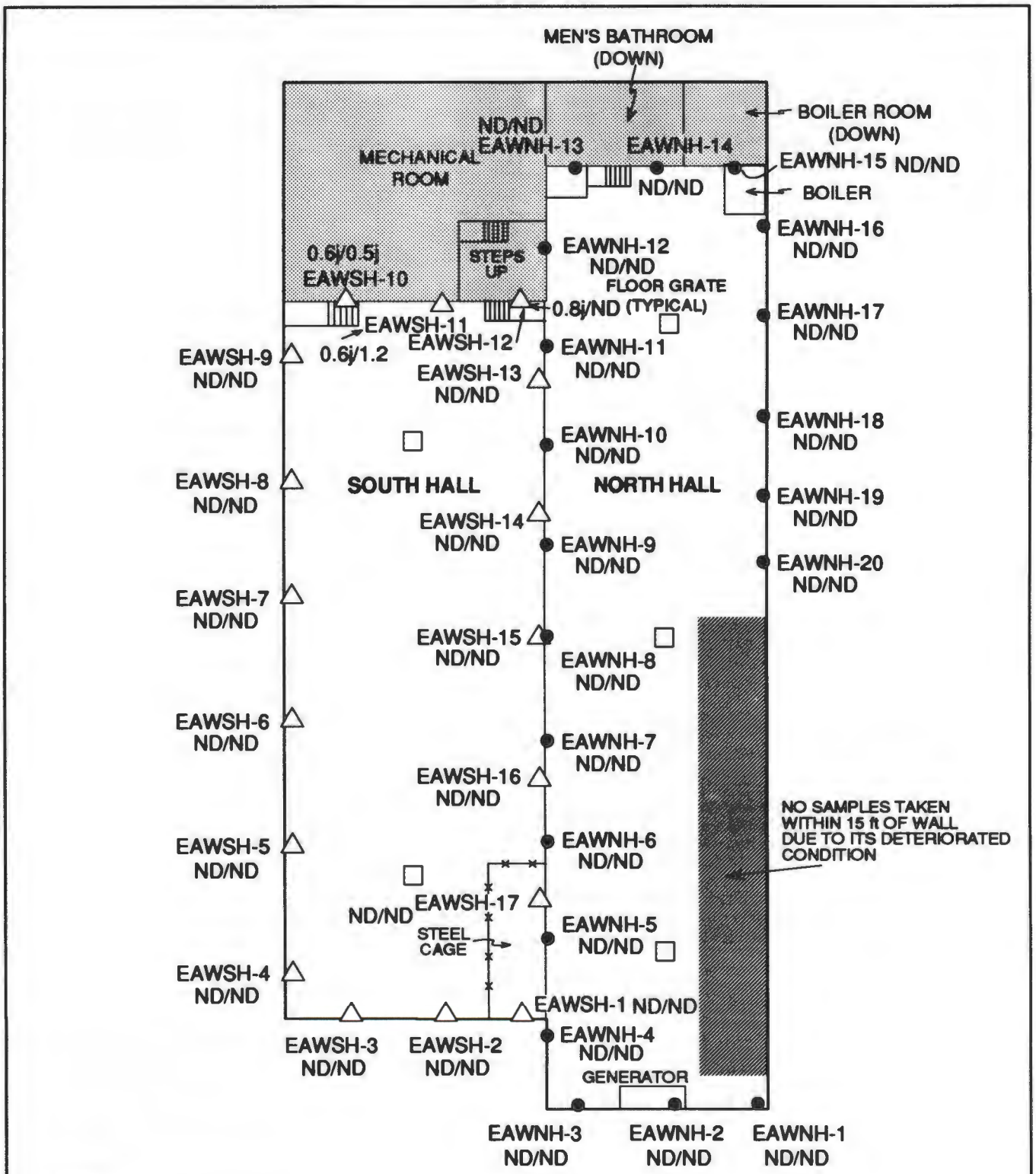
PARAMETER	EAWEB-3	EAWEB-4	EAWEB-5	EAFRW-1	EAFRW-2	EAFRW-3	EAFRW-4	EAFRW-5	EAFRW-6	EAFRW-7	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAFRW-8	EAFRW-9	MS EAFRW-9	EAFRW-10	EAFRW-11	EAFRW-12	EAFRW-13	EAFRW-14	EAFRW-15	EAFRW-16	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10

PARAMETER	EAFRW-17	EAFRW-18	EAFRW-19	EAFRW-20	EAFRW-21	EAFRW-22	EAFRW-23	EAFRW-24	EAFRW-25	EAFRW-26	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)											
Aroclor 1254	ND	ND	0.82 j *	ND	ND	ND	0.7 j *	ND	ND	ND	10
Aroclor 1260	ND	ND	*	ND	ND	ND	*	ND	ND	ND	10

PARAMETER	EAFRW-27	EAFRW-28	MS EAFRW-28	EAFRW-29	EAFRW-30	EAFRW-31	EAFRW-32	EAFRW-33	EAFRW-34	EAFRW-35	EPA CLEANUP LEVEL^
PCBs (µg/100 cm²)											
Aroclor 1254	0.6 j *	ND	•	ND	ND	ND	ND	ND	ND	8.5 j *	10
Aroclor 1260	*	ND	ND	ND	ND	ND	ND	ND	ND	*	10

^ - Reference 14, Appendix A; cleanup level is for total PCBs.
* - Reflects the sum of the flagged Aroclors.
• - Spiking compound; data not representative of actual sample concentration.
j - Estimated concentration; compound present below quantitation limit.
MS - Matrix spike.
ND - Not detected at analytical detection limit; see Appendix G for detection limit.



LEGEND

- ● North hall wipe samples
- △ South hall wipe samples

NOTE: First number is from 2 ft above floor
Second number is from 8 ft above floor
Units = µg/100 cm²
ND = Not Detected
j = estimated concentration

0 30 ft

SCALE
1 in. = 30 ft

FIGURE 4-26

PCB CONCENTRATIONS IN NORTH AND SOUTH HALL WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

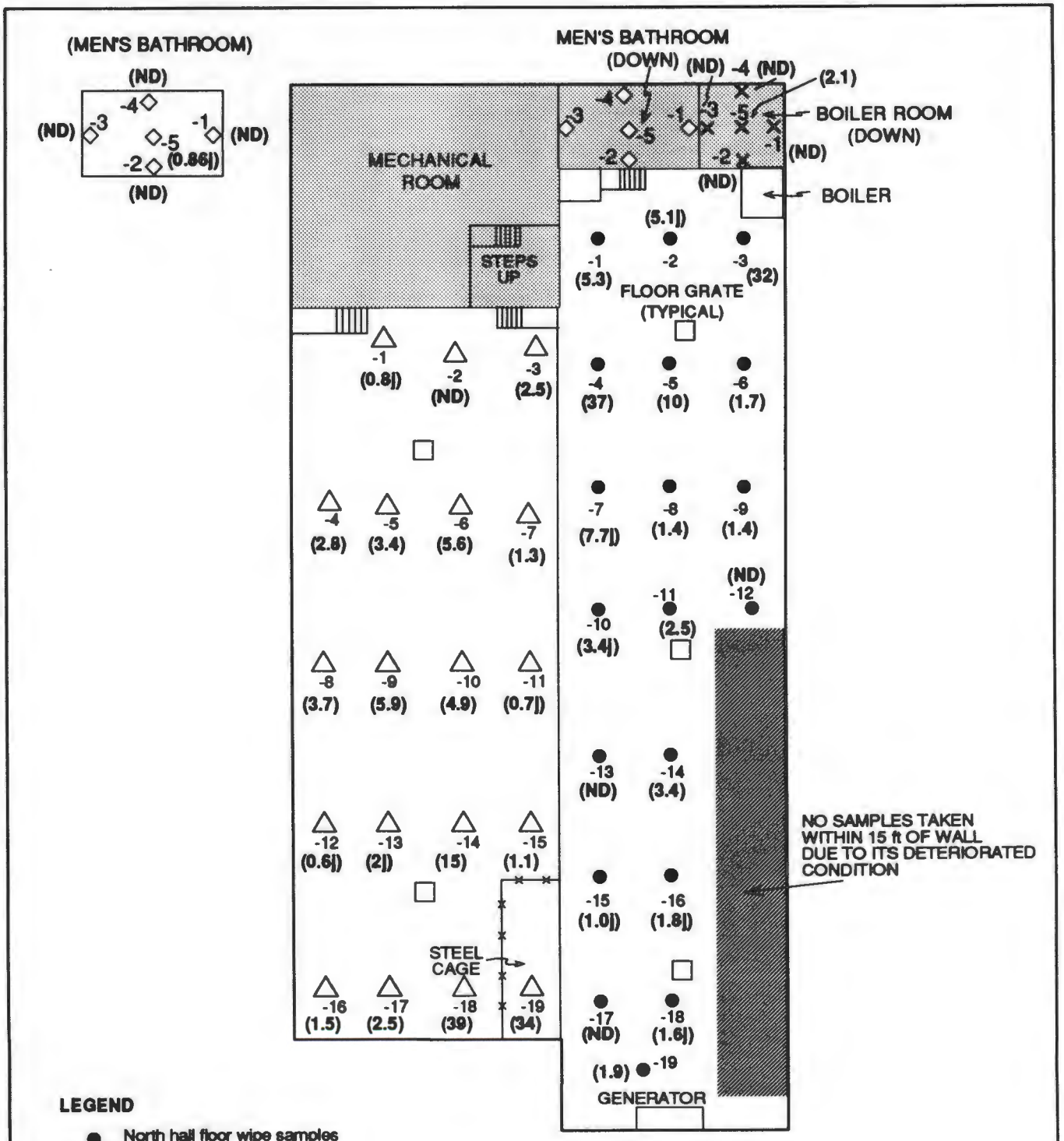
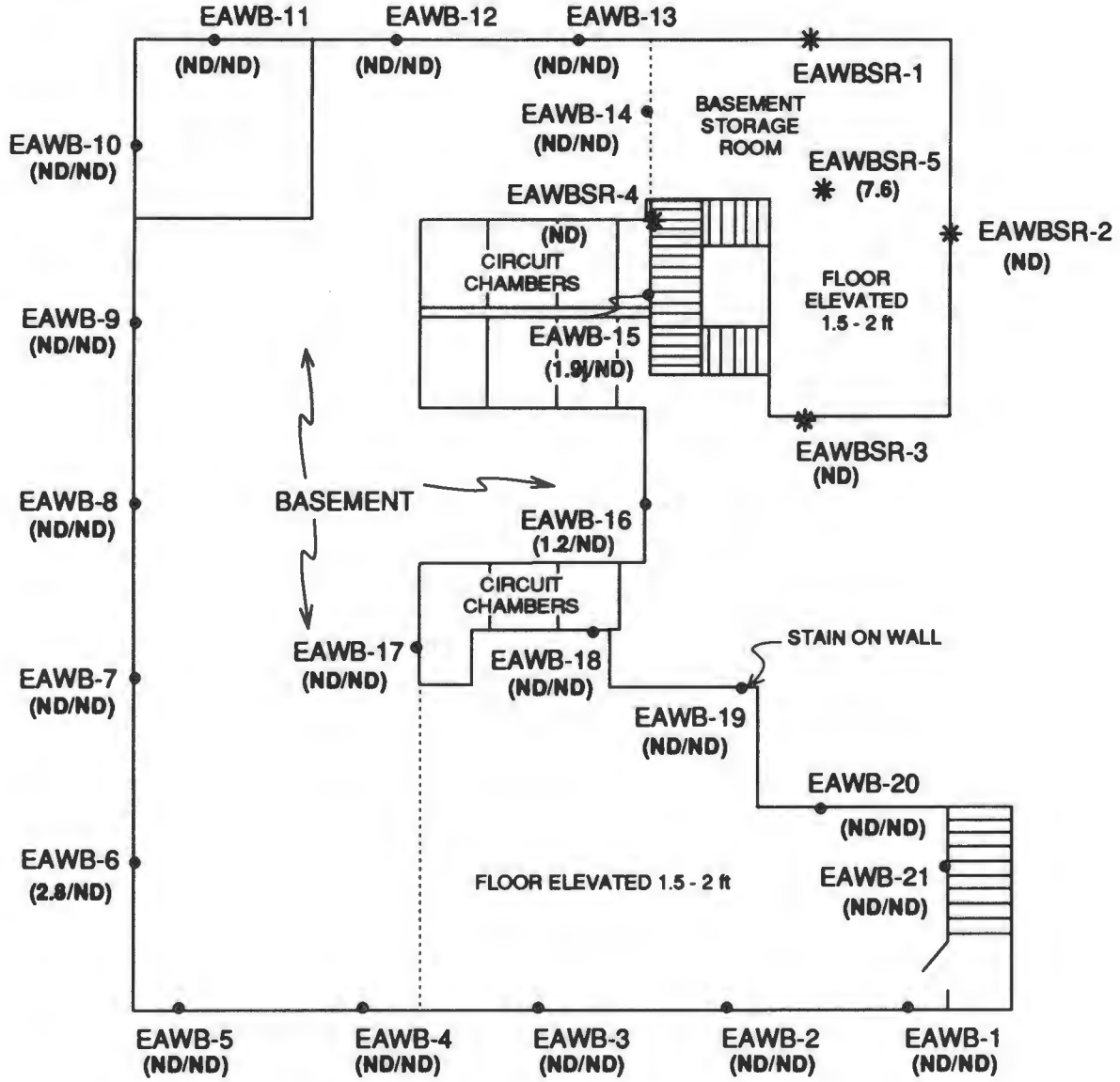


FIGURE 4-27

PCB CONCENTRATIONS IN NORTH AND SOUTH HALL FLOOR, MEN'S BATHROOM, AND BOILER ROOM WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



LEGEND

- ● Basement wipe samples
- ✱ Basement storage room wipe samples

NOTE: Units = µg/100 cm^2
ND = Not Detected
J = estimated concentration

(XX/XX)

NOTE: First number is sample from 2 ft above floor, second number is sample from 8 ft above floor.

0 10 ft

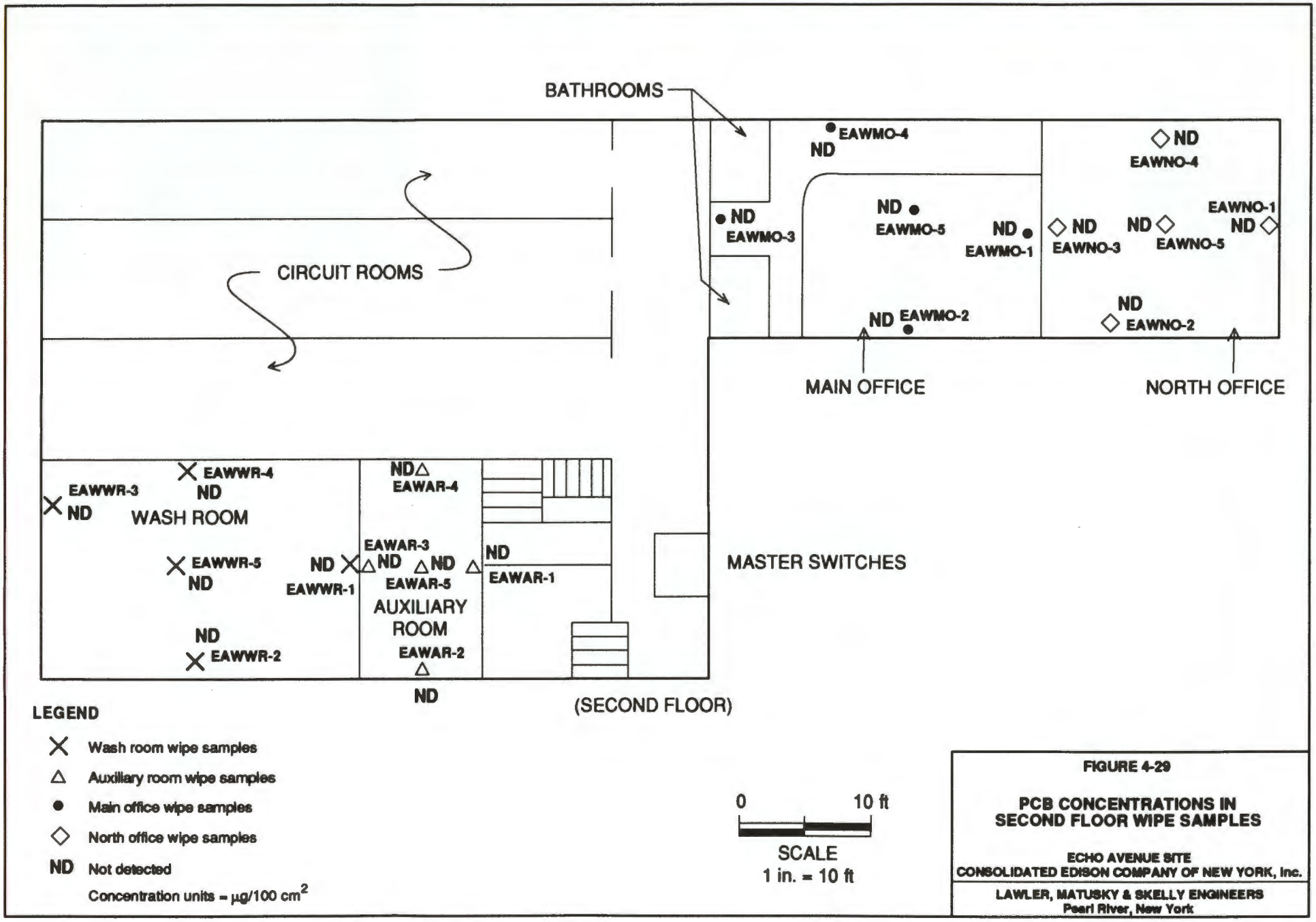
SCALE
1 in. = 10 ft

FIGURE 4-28

PCB CONCENTRATIONS IN BASEMENT AND BASEMENT STORAGE ROOM WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York


BATHROOMS
CIRCUIT ROOMS
EAWMO-4
ND
ND
EAWNO-4
ND
EAWMO-3
ND
EAWMO-5
ND
EAWMO-1
ND
EAWNO-3
ND
EAWNO-5
EAWNO-1
ND
ND
EAWMO-2
ND
EAWNO-2
MAIN OFFICE
NORTH OFFICE
EAWWR-4
ND
EAWWR-3
ND
WASH ROOM
EAWWR-5
ND
ND
EAWWR-1
ND
EAWAR-4
EAWAR-3
ND
ND
EAWAR-5
AUXILIARY
ROOM
EAWAR-2
ND
ND
EAWAR-1
MASTER SWITCHES
ND
EAWWR-2
(SECOND FLOOR)
LEGEND
Wash room wipe samples
Auxiliary room wipe samples
Main office wipe samples
North office wipe samples
ND Not detected
Concentration units = µg/100 cm2
0
10 ft
SCALE
1 in. = 10 ft
FIGURE 4-29
PCB CONCENTRATIONS IN
SECOND FLOOR WIPE SAMPLES
ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.
LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

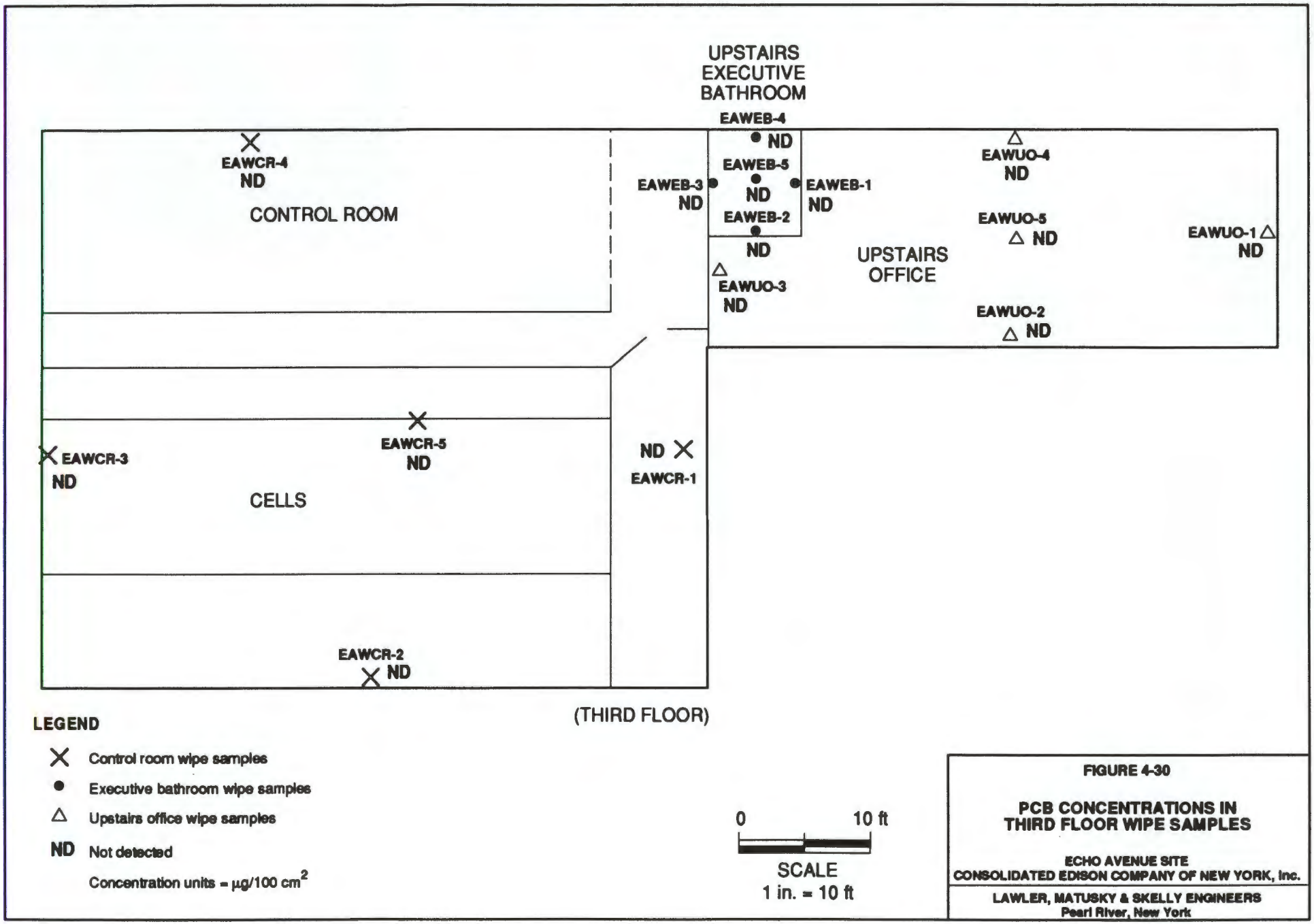


FIGURE 4-30

PCB CONCENTRATIONS IN THIRD FLOOR WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc.

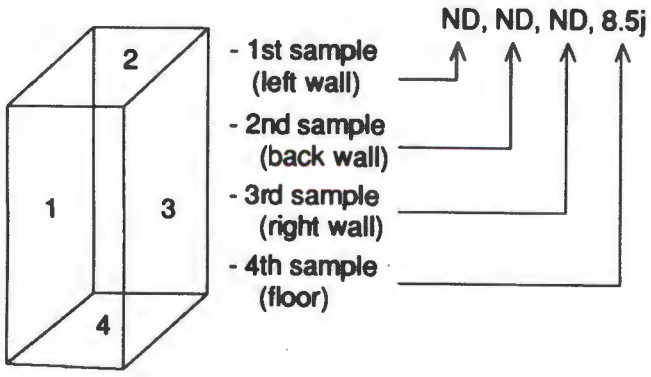
LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

FEEDER ROOM COMPARTMENT SAMPLES

146C	Formerly PCB Contaminated	EAFRW-1, 2, 3	ND, ND, ND, ND
146B		EAFRW-4, 5, 6	ND, ND, ND, ND
146A		EAFRW-7, 8, 9	ND, ND, ND, ND
148B		EAFRW-10, 11, 12	ND, ND, ND, ND
148A		EAFRW-13, 14, 15	ND, ND, ND, ND
147B	Non-PCB Contaminated	EAFRW-16, 17, 18, 19	ND, ND, ND, 0.82j
TRANSFER CIR. B		EAFRW-20, 21, 22, 23	ND, ND, ND, 0.7j
142C		EAFRW-24, 25, 26, 27	ND, ND, ND, 0.6j
149C		EAFRW-28, 29, 30, 31	ND, ND, ND, ND
144 (3rd floor)		EAFRW-32, 33, 34, 35	ND, ND, ND, 8.5j

PCB Contaminated compartments did not get floor samples
(Only 3 wall samples per compartment)

LEGEND



Concentration units = µg/100 cm^2

ND Not detected

j Estimated concentration

FIGURE 4-31

PCB CONCENTRATIONS IN FEEDER ROOM WIPE SAMPLES

ECHO AVENUE SITE
CONSOLIDATED EDISON COMPANY OF NEW YORK, Inc

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

analytical results are shown on Figure 4-27 and provided on Table 4-24 (see samples EAFWSH-).

Five wall samples had detectable quantities of PCBs, consisting of Aroclor 1254 and 1260. The samples were taken from three locations on the southwestern wall and ranged in PCB concentration from 0.5 to 1.2 µg/100 cm^2. At all three locations (EAWSH-10, -11, and -12) PCBs were detected at the 2-ft sample height; only EAWSH-10 and -11 had PCBs detected at the 8-ft height. Eighteen of the 19 floor wipe samples had detectable concentrations of PCBs, ranging from 0.6 to 39 µg/100 cm^2 and consisting of Aroclors 1254 and 1260. The highest PCB concentrations, found in the northern corner of the building, ranged from 15 to 39 µg/100 cm^2. Three of the PCB concentrations exceeded the EPA cleanup level of 10 µg/100 cm^2 for nonrestricted access areas.

4.5.8.3 ***Basement Room***. A total of 42 wall wipe samples were collected from the Basement Room. Samples were collected at approximately 10-ft increments laterally and at 2 and 8 ft above the floor. The samples are designated as EAWB- in Table 4-24 and the data are shown graphically on Figure 4-28. No wipe samples were collected from the floor as it had been sampled in a previous investigation. Three scattered samples had detectable quantities of PCBs. These samples, EAWB-6, -15, and -16, were all at the 2-ft height and consisted of Aroclor 1254 and 1260. The PCB concentrations ranged from 1.2 to 2.8 µg/100 cm^2, well below the EPA cleanup level for nonrestricted access areas.

4.5.8.4 ***Basement Storage Room***. A total of five wipe samples were collected in the Basement Storage Room. These are designated as EAWBSR- in Table 4-24 and are shown graphically on Figure 4-28. Four samples were collected from each wall of the room, approximately at the center of the wall 5 ft above the floor. One sample was collected from the middle of the floor. The results from the wall samples indicate no contamination by PCBs in any of the samples. The floor sample, EAWBSR-5, had a concentration of 7.6 µg/100 cm^2 of PCBs, consisting of Aroclor 1254 and 1260; this concentration is below the EPA cleanup level of 10 µg/100 cm^2.

4.5.8.5 ***Mens Room***. Five wipe samples (four wall and one floor) were taken from the Mens Room located in the basement of the substation. The four wipe samples were taken in the middle of the wall approximately 5 ft above the floor; the floor sample was collected in the middle of the floor. The results are shown on Table 4-24 as EAWMR- and presented graphically in Figure 4-27. None of the wall wipes had detectable levels of PCBs. The floor wipe had a concentration of 0.89 $\mu g/100\ cm^2$ of PCBs, consisting of Aroclor 1254 and 1260. This concentration is significantly lower than the EPA cleanup level of 10 $\mu g/100\ cm^2$.

4.5.8.6 ***Boiler Room***. A total of five wipe samples, one from the middle of each of the walls and one from the middle of the floor, were collected from the Boiler Room. The results are shown on Table 4-24 and presented graphically in Figure 4-27, with a sample identification of EAWBR-. None of the wall wipes had detectable concentrations of PCBs and the floor wipe had a total concentration of 2.1 $\mu g/100\ cm^2$ of PCBs, well below the EPA cleanup level of 10 $\mu g/100\ cm^2$.

4.5.8.7 ***Wash Room***. Five wipe samples were collected in the Wash Room, located on the second floor of the substation building. Wipes were collected from each of the four walls and the middle of the floor and are identified as EAWWR-. The results are shown in Figure 4-28 and summarized on Table 4-24. No detectable concentrations of PCBs were found in the Wash Room samples.

4.5.8.8 ***Auxiliary Room***. Figure 4-29 shows the results and locations of the five wipe samples collected from the Auxiliary Room. The sample locations are indicated as EAWAR-. The analytical results for these samples, shown on Table 4-24, indicate no detectable quantities of PCBs in any of the samples.

4.5.8.9 ***Main Office***. The Main Office is also located on the second floor. A total of five wipes were collected in the Main Office, one from each wall and one from the floor. The samples are designated as EAWMO- and the results are summarized on Table 4-24 and presented graphically in Figure 4-29. No detectable PCBs were found in any of the samples.

4.5.8.10 ***North Office.*** The North Office is located adjacent to the Main Office on the second floor. The results of the five wipe samples taken here are shown on Table 4-24 and presented in Figure 4-29. The sample locations are designated as EAWNO-. No PCBs were detected in any of the samples.

4.5.8.11 ***Control Room.*** Five wipe samples were collected from the Control Room located on the third floor, four from each of the walls and one from the floor. The samples are designated as EAWCR- and the results are shown on Table 4-24 and depicted graphically in Figure 4-30. No detectable quantities of PCBs were found in any of these samples.

4.5.8.12. ***Upstairs Office*** The Upstairs Office is located on the third floor. The results of the four wall wipes and one floor wipe are shown in Figure 4-30 and summarized on Table 4-24. The samples from the Upstairs Office were designated as EAWUO-. None of the samples had detectable quantities of PCBs.

4.5.8.13 ***Upstairs Bathroom.*** The Upstairs Bathroom, or Executive Bathroom, is located on the third floor next to the Upstairs Office. The results of the wipe samples (indicated as EAWEB-) are shown on Table 4-24 and presented graphically in Figure 4-30. None of the samples had detectable quantities of PCBs.

4.5.8.14 ***Feeder Room Compartments.*** Wipe samples were collected from Feeder Room Compartments that were formerly contaminated with PCBs but which have since been cleaned up. Samples designated as EAFRW-, were collected from the left wall, back wall, and right wall of five Feeder Room Compartments; samples were not collected from the floor as this had been sampled in a previous investigation. Table 4-29 presents the analytical data and Figure 4-31 shows a graphical summary of the data from these Feeder Room samples. None of the samples had detectable quantities of PCBs.

Five other non-PCB Feeder Room Compartments were also sampled. In addition to the three wall wipes described above, one floor wipe was also taken in these compartments. These sample results are also shown in Figure 4-31 and summarized on Table 4-24. All of the wall wipe samples had no detectable concentrations of PCBs; however, four of the five

floor wipe samples had detectable quantities of PCBs, ranging from 0.6 to 8.5 $\mu g/100\ cm^2$. These PCB concentrations are below the EPA cleanup level of 10 $\mu g/100\ cm^2$ for substations in residential areas.

4.5.9 Miscellaneous Data

The work plan stated that the concrete corer would require the use of potable water and required a sample of the water used in the corer to be analyzed for PCBs. Because the actual corer used did not require water, no sample was needed. However, a sample of the water used by the driller for decontamination purposes was collected and analyzed for PCBs; the data are provided on Table 4-18. No PCBs were detected in this water sample.

4.6 CONCLUSIONS

The conclusions of the Phase II investigation are presented in this section by type of media sampled.

4.6.1 Test Borings

Seven test borings were drilled on the site during the Phase II investigation; in one of which a new monitoring well was installed. Full TCL and TAL analyses were run on each of four samples from the monitoring well test boring. Only PCBs analyses were performed on the remaining six test boring samples, which included three subsurface samples and one surface sample from each boring. The new monitoring well, MW-6, was drilled in the area of the cable vault located near the southern corner of the substation building. Low concentrations of PAHs, PAEs, naphthalene and like substances, and pesticides were detected in the samples from the monitoring well boring. The highest concentrations were found in the 0- to 2-ft sample, where 37.510 mg/kg of PAHs, 0.420 mg/kg of PAEs, 2.130 mg/kg of naphthalene and like substances, and 0.0528 mg/kg of pesticides were detected. The PAHs are probably associated with coal tars, asphalt, or petroleum products; the naphthalene and like substances with diesel fuel; and the pesticides with insecticides used on the site for termite and other pest control. The remaining samples had no PAHs, no naphthalene and like substances, and

no pesticides. The PAE found in all four boring samples, B2EHP, is a common laboratory contaminant and its presence is probably due to laboratory contamination. VOC TICs and SVOC TICs were found at 8-10 and 10-12 ft and in all four depth samples, respectively. With the exception of the SVOC data in the 0- to 2-ft interval, all TIC concentrations were low; TIC SVOCs in the top sample totaled 22.840 mg/kg and consisted of naphthalene-like substances, benzene-related compounds, and PAHs. No PCBs were detected in any of the samples from this boring.

Metals and cyanide analyses were also performed on each of the four samples from this test boring; with the exception of the lead data, the highest concentrations were found in the two deepest samples (i.e., 8-10 ft and 10-12 ft). This finding of higher concentrations at greater depths suggests that the metals are part of the native soil and not attributable to fill material or other on-site sources. The lead concentration was highest in the surface soil sample and was probably related to diesel fuel use in the area. Cyanide was not found in any soil sample from this boring.

Six borings were also drilled to a depth of 4 ft in the southeastern portion of the property, with samples collected at 1-2, 2-3, and 3-4 ft and analyzed for PCBs. EATB-1 was located along the chain link fence closest to Echo Bay. PCBs were only found in the 1- to 2-ft sample and at a concentration of only 0.015 mg/kg. EATB-2 was drilled about halfway down the chain link fence along the eastern side of the property and had 0.022 mg/kg of PCBs in only the 1- to 2-ft sample. The third test boring, EATB-3, was located at the southeastern corner of the property and had no detectable quantities of PCBs. EATB-4 was drilled just to the east of an area previously remediated and had 0.340 and 0.106 mg/kg of total PCBs in the 1- to 2-ft and 2- to 3-ft samples, respectively. EATB-5 was drilled to the southwest of the office/storage building and only had PCBs in the 3- to 4-ft sample at a concentration of 0.155 mg/kg. The sixth boring, EASESS-11, which was dug by hand, was located south of the substation building and had 0.015 mg/kg of PCBs in the 3- to 4-ft sample. None of the PCB concentrations detected in any of the test borings exceeded the EPA cleanup level of 10 mg/kg for substations in residential areas.

4.6.2 **Shallow Soil**

Eleven shallow soil samples were collected along the chain link fence bordering the southeastern area of the property. Five samples were taken at approximately equal intervals along the eastern fence line and seven at equal intervals along the southern fence line. Six of these samples were collected at the same sample location as the test borings. The depth of the sample varied, alternating between 0-3 and 0-6 in. Sample EASESS-3 had the highest concentration of PCBs (6.2 mg/kg) of the samples along the eastern fence. The PCB concentrations in the reminder of these eastern fence samples ranged from 0.064 to 0.113 mg/kg. Low levels of PCBs were found in all samples along the southern fence, ranging in concentration from 0.042 mg/kg at EASESS-11 to 1.090 mg/kg at EASESS-7. None of the levels found in any of the samples along the southeastern portion of the property had levels above the EPA cleanup level of 10 mg/kg for substations in residential areas. With the exception of samples EASESS-3 and -7 all samples are <1 mg/kg, which by EPA definition is considered "clean fill" (Ref. 14, Appendix A).

Eight soil samples were collected in the southwestern portion of the property just to the southwest of the outdoor transformer yard. Samples were collected at depths of alternating between 0-3 and 0-6 in. Samples EASWSS-1 to -3, located to the southwest of the southern transformer area, had PCB concentrations ranging from ND in EASWSS-3 to 0.067 mg/kg in EASWSS-2. EASWSS-4 and -5 were collected on the western area bordering Echo Avenue and had 0.013 and 0.063 mg/kg of PCBs in each sample, respectively. EASWSS-6 was taken from the middle of the upper sampling area to the southwest of the northern transformer area and had 0.026 mg/kg of PCBs. The last two samples, EASWSS-7 and -8, were taken along the boundary of the northern transformer yard area and had 0.080 and 0.021 mg/kg of PCBs in the two samples, respectively. This area is topographically at least 10 ft higher than the outdoor transformer yard and appears not to be affected by any residual contamination in the transformer yard. All PCB concentrations were well below the EPA cleanup level of 10 mg/kg in substations in residential areas and would also be considered clean fill, i.e., <1 mg/kg of total PCBs (Ref. 14, Appendix A).

One shallow soil sample was collected within the outdoor transformer yard in transformer moat No. 5. It had 0.380 mg/kg of PCBs, well below the EPA cleanup level of 10 mg/kg.

Six additional shallow soil samples collected at the direction of the on-site NYSDEC representative were analyzed for PCBs. Three of the samples were also analyzed for TCL and TAL parameters. EADEC-A was collected approximately 13 ft off the chain link fence on the eastern side of the property between EATB-2 and EASESS-4. The sample was collected from a depth of 0-6 in. and had 0.420 mg/kg of PCBs.

EADEC-B was located 6 ft from the fence between EATB-1 and EASESS-2 at a depth of 0-6 in. It was analyzed for the full TCL and TAL compounds. No VOCs were detected in this sample and only 0.340 mg/kg of PAHs and 0.200 mg/kg of PAEs in the SVOC fraction were found. The sample also had 0.374 mg/kg of SVOC TICs. Three pesticides at low levels and no PCBs were detected in this sample. Of the metals analyzed, only mercury and magnesium were found at concentrations above the range for native soil. Mercury was not detected at depth in the boring soil samples from EAMW-6, which indicates that the mercury in EADEC-6 may be associated with the fill material and is not a component of the native soil.

EADEC-C was collected at a depth of 0-6 in. and was located 3.5 ft from the square grate that appeared to be a shallow catch basin. The sample was analyzed for PCBs only and had 0.026 mg/kg of Aroclor 1260. Two peaks observed by the laboratory in the chromatograms were tentatively identified as alpha- and gamma-chlordane at concentrations of 0.0035 and 0.0046 mg/kg, respectively, even though pesticides were not specifically analyzed. EADEC-D was located 14 ft to the west of the bend in the fence and 5 ft away from the fence. The sample was analyzed for the full TCL and TAL compounds. No VOCs were found in the sample; however, 0.230 mg/kg of PAHs, 0.250 mg/kg of PAEs, and 0.130 mg/kg of naphthalene were detected. The concentration of SVOC TICs totaled 0.745 mg/kg. No pesticides or PCBs were detected in the sample. Several metals were detected above the concentration range for native soil - antimony, arsenic, copper, lead, magnesium, and mercury. The metals do not appear to be associated with native soil, except for magnesium, and their presence may be associated with fill material used on the site.

All TCL and TAL compounds were analyzed for in sample EADEC-E, which was taken from a compost pile at the corner of the fence. No VOCs were found but the sample had elevated concentrations of PAHs (9.95 mg/kg), low concentrations of PAEs (0.450 mg/kg), and 2MN (0.240 mg/kg), in the SVOC fraction. The total concentration of TICs was elevated at 13.609 mg/kg and consisted mostly of PAHs, naphthalene-like substances, and benzene-like compounds. The PAHs are probably associated with asphalt and fuel products, including diesel fuel used on site as evidenced by the finding of 2MN and the benzene and naphthalene-like substances found in the TICs. A variety of pesticides at a concentration of 0.648 mg/kg, consisting of polycyclic chlorinated hydrocarbons, were also found in this sample, but these estimated concentrations maybe high due to interferences with PCB chromatogram peaks. The pesticides may have been used at the site for termite or pest control. The concentration of PCBs found in this sample was 12.0 mg/kg, which exceeds the EPA cleanup level of 10 mg/kg for substations in residential areas. Metals in this sample that were detected outside the native soil concentration range included cadmium, zinc, copper, lead, magnesium, and mercury. Except for magnesium, these metals may be associated with fill materials use on the site.

The sixth NYSDEC sample, EADEC-F, was collected at a depth of 0-6 in. between two tall columns at the eastern end of the outdoor transformer yard. Low levels (0.059 mg/kg) of total PCBs were found in this sample.

With the exception of the one sample from the compost pile, all the specified NYSDEC samples had PCB concentrations below the EPA cleanup level of 10 mg/kg and would be considered clean fill, i.e., <1 mg/kg of total PCBs by EPA (Ref. 14, Appendix A).

4.6.3 **Groundwater**

Six monitoring wells were sampled as part of the Phase II investigation. During the first round, samples were analyzed in accordance with the standard NYSDEC Analytical Services Protocol (ASP). Because few volatiles and no PCBs were detected in the samples, NYSDEC requested that the second round VOC analyses be conducted using EPA Method 542.2 and that the PCB analyses be conducted using the ASP analysis for low-level detection. Due to

laboratory error the holding times for the second round VOC analysis were exceeded and the sample data were determined to be unusable. The wells were resampled and reanalyzed for VOCs in December 1992.

The on-site monitoring wells EAMW-1 and -6 (the new well installed as part of this Phase II investigation) can be considered to be upgradient of the sources of contamination on the site. Neither of these wells had detectable levels of VOCs or any TICs during the first sampling round. No VOCs or TICs were found during the second round at EAMW-6, however, one TIC, acetone, was detected at EAMW-1. The acetone is most likely associated with laboratory contamination. B2EHP was found in both wells in both sampling events; however, the presence of this compound is most likely attributable to laboratory contamination. SVOC TICs, consisting mostly of unknowns, totaled 27.5 and 82 µg/l in EAMW-1 during the first and second round of sampling, respectively, and 2 and 82 µg/l in the first and second sampling round, respectively in EAMW-6. Only one TIC in EAMW-1 exceeded the NYSDEC guidance value of 50 µg/l in the second sampling round. No pesticides or PCBs were detected in either sampling round in either well. Several metals were found above the groundwater standard in both wells - arsenic in the first sampling round at EAMW-1 and iron, manganese, and sodium in both wells during both sample events. The sodium concentration is most likely due to aerosol deposition after evaporation from Echo Bay and subsequent dissolution precipitation, and the remaining metals are associated with soils surrounding the monitoring well. Several metals (aluminum, cadmium, chromium, iron, lead, manganese, potassium, and vanadium) were detected above the ambient background concentrations in typical groundwater. Cyanide was not found in any of the samples collected from these two wells.

EAMW-2 and -3 are located in the vicinity of the outdoor transformer yard. No VOCs were detected in either groundwater sample during the first or second round. TICs were found at low levels in the first and second round at EAMW-3 and in the second round at EAMW-2. Only one SVOC (B2EHP), was detected in both samples in both sampling rounds. The B2EHP concentration is likely a result of laboratory contamination. TICs in the SVOC fraction were found at low concentrations in both samples from EAMW-2 and the first round sample at EAMW-3. No pesticides or PCBs were detected in either monitoring well,

indicating that no residual PCBs in the outdoor transformer yard are entering the groundwater. Several metals were detected above the groundwater standard in these wells: arsenic in both samples at EAMW-2; beryllium, cadmium, chromium, and manganese in both samples from EAMW-3; lead in the first round sample at EAMW-2 and in both samples at EAMW-3; and iron and sodium in both wells in both sample rounds. In a filtered sample from EAMW-3 manganese was the only metal concentration above the groundwater standard, indicating that the metals found in the groundwater are associated with particulate material and are not dissolved. Cyanide was not found in any of the samples from these wells.

Two wells located close to Echo Bay, EAMW-4 and -5, exhibit groundwater table fluctuations up to 6 ft due to tidal effects. The wells were sampled during the falling tide to minimize the effects of bay water intrusion. Toluene was detected during the first sample round in EAMW-4 at an estimated concentration of 2 µg/l, which is below the groundwater standard of 5 µg/l for this compound. No VOCs were detected in the second round. One unknown TIC was also found in the sample from the first round at a concentration of 5 µg/l, well below the guidance value of 50 µg/l for TICs. No TICs were found in the second round. No VOCs were found during the first or second round at EAMW-5. One TIC, acetone, was detected in the second round. B2EHP was detected in the second sample round at EAMW-4 and in both samples from EAMW-5, and is likely present due to laboratory contamination. TICs in the SVOC fraction were detected in both samples in the second round but not in the first round. None of the individual TIC compounds exceeded the guidance value of 50 µg/l for TICs. No pesticides or PCBs were found in any of the samples from these two wells, indicating that any residual PCBs on site are not entering the groundwater. Several metals were detected above the groundwater: beryllium, magnesium, and sodium in both wells in both sample rounds; manganese in the first round at EAMW-4; and iron in both samples from EAMW-4 and the first sample round at EAMW-5. Metals found above the typical ambient groundwater were calcium, potassium, magnesium, and sodium in all samples; aluminum in the second round at EAMW-4; and lead in both samples from EAMW-4. The calcium, magnesium, potassium, and sodium concentrations are most likely associated with saltwater intrusion, and the remaining metals are most likely associated with particulates and are not dissolved in the groundwater. Cyanide was not found in any of the samples from these wells.

4.6.4 **Surface Water**

A surface water sample was taken twice from Echo Bay in conjunction with the groundwater sampling program. VOCs and PCBs were analyzed using EPA Method 542.2 and the ASP low-level method, respectively, for the second round sample to achieve a lower detection limit. Due to laboratory error, the holding time for VOCs was exceeded and resampling and reanalysis conducted. The resampling occurred in December 1992. No VOCs were detected during the first round of sampling. Three VOCs (1,2-DCE, VC, and EB) were found at low levels during the second round. TICs were also found at low levels in the second round. PAEs were found in the first and second round of sampling, totaling 12.0 and 20 µg/l, respectively. Most of the PAE contamination was due to B2EHP, a laboratory contaminant. SVOC TICs were detected at a concentration of 8 µg/l in both samples. No pesticides or PCBs were detected in either surface water sample, indicating that any residual PCBs on site were not migrating into the bay. The concentrations of three metals (copper, lead, and zinc) exceeded the Class SB surface water standard and the concentration of cadmium exceeded the guidance value for human consumption of fish. Copper, lead, and zinc were also detected in the groundwater from the wells closest to the bay, but at low levels. The concentrations of calcium, magnesium, potassium, and sodium were similar to those found in the groundwater in wells EAMW-4 and -5, indicative of the tidal influence on the groundwater. The concentrations of copper, lead, and zinc in the groundwater may also be related saltwater intrusion from the bay.

4.6.5 **Sediment**

A total of 72 sediment samples were collected from Echo Bay, consisting of 18 2-ft cores divided into four equal segments that were subsequently analyzed for PCBs only. The PCB concentrations detected were extremely low, with the highest levels found in the area of the bulkhead on the western end of the bay and may be at background levels. All samples had less than 1 mg/kg of total PCBs, with most of the contamination found in the upper 0-6 in. of sediment. In accordance with NYSDEC guidance for soil disposal, the sediment in Echo Bay would be considered construction and demolition debris based on the low levels of PCBs found.

The sediment in six drainage pipes that discharge from the site to Echo Bay were also sampled and analyzed for PCBs. The concentrations of PCBs found in these pipes ranged from ND to 0.790 mg/kg, indicating that the drainage pipes are not a significant source of PCBs.

Sediments in double manhole MH-3 were also sampled and analyzed for PCBs. Because a baffle divided the manhole, separate sediment samples were collected from each side. The standing water in the manhole common to both sides was also sampled for PCBs. The water did not have any detectable concentrations of PCBs. The concentration of PCBs in the "A" or south side of the manhole was 3.180 mg/kg, a concentration which would classify the sediment as construction and demolition debris. The "B" or north side of the manhole had 12.700 mg/kg of PCBs. According to NYSDEC guidelines sediment containing between 5 and 50 mg/kg of PCBs would be classified as nonhazardous industrial waste. This sediment concentration is also higher than the 10-mg/kg EPA cleanup level for soils at substations in residential areas.

4.6.6 **Concrete Cores**

A total of 42 concrete core samples were obtained and analyzed for PCBs. At each location 1-in. deep cores at five locations were taken, pulverized, placed in sample jars, and analyzed. Cores were taken from five transformer moats on site (five separate samples from each of four transformer moats and two from a fifth transformer moat) and from 20 other locations throughout the outdoor transformer yard where stained areas were in evidence. The core samples taken from the transformer moats had total PCB concentrations that ranged from ND to 7.707 mg/kg, with all but two samples <1 mg/kg.

The concrete cores from the stained areas also had low levels of PCBs, with the results ranging from ND to 0.930 mg/kg. Based on these results, little residual PCB contamination remains in the outdoor transformer yard and all stained areas and transformer moats have PCB concentrations less than the cleanup level.

4.6.7 Structures

Thirteen separate rooms and 10 feeder room compartments within the substation were sampled for PCBs. Wipe samples of the walls and/or floor in these areas were taken using a 100-cm^2 template. Five wipe samples (four wall and one floor) were taken from the wash room, auxiliary room, main office, and north office (all located on the second floor) and the control room, upstairs office, and executive bathroom (all found on the third floor). None of these wipes had detectable concentrations of PCBs.

The two large vacant halls located on the first floor were sampled with wall wipes taken at 2 and 8 ft above the floor on every wall (a 100-ft section of the eastern portion of the north wall in the North Hall was not sampled because of its poor structural condition). Of the 74 wall wipes obtained, only five (all in the South Hall) had detectable levels of PCBs. These five samples were located along the southwestern wall and had concentrations of PCBs ranging from 0.5 to 1.2 $\mu g/100\ cm^2$, which is less than the EPA cleanup level of 10 $\mu g/100\ cm^2$ for electric substations in residential areas. Nineteen floor wipes were taken from each vacant hall; of these, 16 in the North Hall and 18 in the South Hall had detectable concentrations of PCBs. Fourteen of the samples in the North Hall and 15 in the South Hall had PCB concentrations less than 10 $\mu g/100\ cm^2$. The two floor wipes in the North Hall that had PCB concentrations exceeding the EPA cleanup level were located in the eastern end of the building and had levels of 32 and 37 $\mu g/100\ cm^2$. Three floor wipes in the northern corner of the South Hall exceeded the PCB cleanup level, with concentrations ranging from 15 to 39 $\mu g/100\ cm^2$.

In the substation, wipe samples were also collected and analyzed for PCBs from the basement room and basement storage room. The basement room walls were sampled at both the 2- and 8-ft heights. Only three samples had detectable PCB concentrations, ranging from 1.2 to 2.8 $\mu g/100\ cm^2$, below the EPA cleanup level of 10 $\mu g/100\ cm^2$. No floor wipes were collected in the basement as this had been sampled during a previous investigation. No PCBs were detected in the four wall wipes collected in the basement storage room; however, the floor wipe had a PCB concentration of 7.6 $\mu g/100\ cm^2$.

Ten feeder room compartments were also sampled. No PCBs were detected in the wall samples from the five PCB feeder room compartments, reflecting a successful previous cleanup in this area. In four of the five non-PCB feeder room compartments low levels (ND to 0.82 $\mu g/ 100\ cm^2$ on the floor and none on the walls) of PCBs were detected. The fifth compartment had no detectable PCBs on the walls but 8.5 $\mu g/100\ cm^2$ of PCBs on the floor. All of the PCB concentrations detected were below the cleanup level of 10 $\mu g/100\ cm^2$.

The results of the wipe sampling indicates, in general, that the substation building is fairly clean of PCBs, with no PCBs detectable on the top two floors and mostly low levels (<1 $\mu g/100\ cm^2$) in the other portions of the building. Areas where PCB concentrations exceed the cleanup level (>10 $\mu g/100\ cm^2$) exist, but are all confined to a small area of the North and South Hall floors.

4.6.8 **Summary of Conclusions**

The following summarizes the conclusions derived from the Phase II investigation of the Echo Avenue site:

- In general, the site is clean with the vast majority of the site cleaned up to the EPA Cleanup level of 10 mg/kg in soils and 10 $\mu g/100\ cm^2$ in structures.

- Soils on the site have slightly elevated concentrations of PAHs, naphthalene and like substances, chlorinated pesticides, lead, mercury, antimony, arsenic, copper, cadmium, and zinc. The PAHs are most likely associated with coal tars, asphalt, or fuel products used on site. The naphthalene and lead are probably associated with diesel fuel or other fuel used on site. The pesticides are most likely from insecticides used for termites and other pest control. The metals appear to be limited to the surface and near surface and may be associated with the fill materials used on site.

- PCBs were found in the soil at very low concentrations throughout the site. With the exception of two small areas on the southeastern portion of the property, PCBs in that area were less than 1 mg/kg. PCBs in the two areas that were greater than 1 mg/kg were still below the EPA cleanup level of 10 mg/kg. PCB concentrations in the southwestern area of the property were all below 0.1 mg/kg; one soil sample taken in the transformer yard had greater than 0.1 mg/kg but below 1 mg/kg of PCBs. Other scattered areas on the site had PCBs levels less than 1 mg/kg. Only one sample taken in the compost pile a had PCB concentration greater than the 10 mg/kg cleanup level. With the

exception of three samples the soil has <1 mg/kg of total PCBs, which would classify it as clean fill according to EPA.

- PCBs were not detected in the groundwater. One VOC was found at a very low level during the first round at one well. Metals found at concentrations that exceeded groundwater standards included arsenic, cadmium, chromium, iron, manganese, magnesium, and sodium; beryllium was also found at a concentration exceeding its guidance value. The arsenic, beryllium, cadmium, chromium, iron, and manganese concentrations appear to be associated with particulate matter in the groundwater and the magnesium and sodium levels are related to saltwater intrusion from the bay.

- Surface waters in Echo Bay did not have any detectable PCBs. VOCs were found at low levels. Several metals were detected above the Class SB surface water standards but not at significant levels.

- Sediment in the drainage pipes and in Echo Bay had low concentrations of PCBs (less than 1 mg/kg).

- Sediment in the north side of the one manhole had concentrations of PCBs of over 10 mg/kg.

- Stained concrete areas in the outdoor transformer yard generally had PCB concentrations below 1 mg/kg. Two sample concentrations were above 1 mg/kg but were below 10 mg/kg of PCBs.

- Except for scattered areas on the floors in the two vacant halls, no PCBs or low levels of PCBs were detected by wipe samples. A few small areas had PCBs in excess of the EPA cleanup level of 10 $\mu g/100\ cm^2$.

- The PCB Aroclors 1254 and 1260 found in most of the samples are those usually associated with transformers.

4.7 RECOMMENDATIONS

Based on the results and conclusions of this Phase II investigation, the following recommendations are made for the Echo Avenue site:

- Delineate the area of shallow soil contamination where over 10 mg/kg of PCBs were found. Excavate contaminated soil to a depth of 10 in., conduct post-cleanup monitoring, and backfill with clean fill.

- Dewater the manhole and remove and dispose of the sediments in MH-3; fill the manhole with concrete.

- Double pressure wash scattered areas on the floor in the vacant halls showing moderate concentrations of PCBs. Verify the cleanup with wipe sampling.
- Fill in and restore the area where the storage shed was located to the east of the office/storage building.
- Fill in and restore the area southeast of the office/storage building.