SITE EVALUATION

120 LISTER AVENUE

SUBMITTED TO

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

PREPARED BY

DIAMOND SHAMROCK CHEMICALS COMPANY
IT CORPORATION
WOODWARD-CLYDE CONSULTANTS
ENVIRO-MEASURE, INC.

MAY 1985

VOLUME I

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DRAWN BY	J. LOGRECO	4-19-85
CHECKED BY	MD	5-1-85
APPROVED BY	DHE	5-1-85

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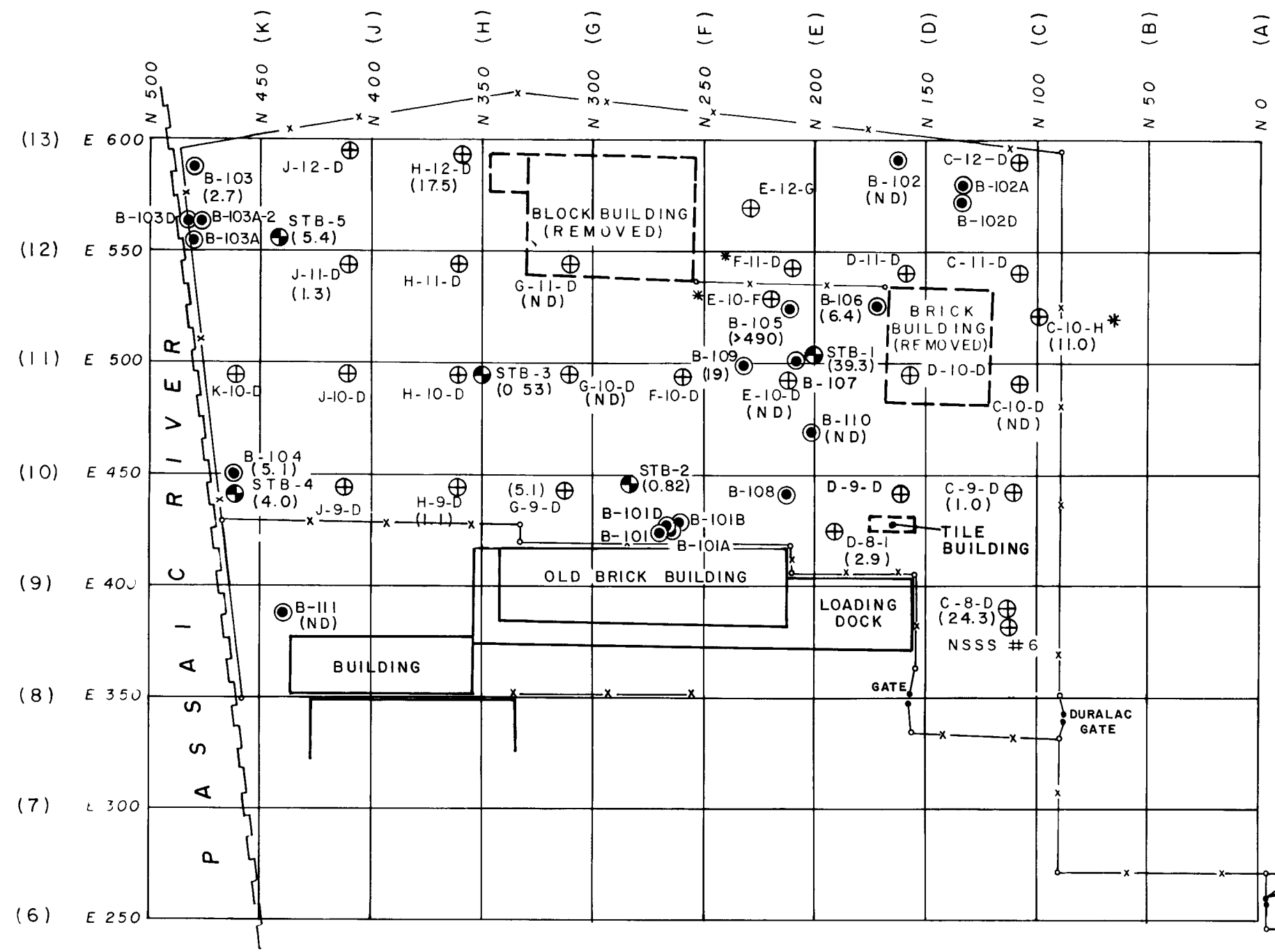

LEGEND.

- STB-3 — DEEP BORING LOCATION AND NUMBER
- B-104 — BORING LOCATION AND NUMBER
- D-8-1 — NEAR SURFACE SOIL SAMPLE AND NUMBER.
- (347) — INDICATES CONCENTRATIONS (ppb)
- ND — NOT DETECTED

SCALE
0 60 120 FEET

NOTE.

* SAMPLE OR BORINGS WHICH HAVE BEEN RELOCATED ARE PLOTTED BY NORTH AND EAST COORDINATES ONLY. LETTER COORDINATES MAY NOT MATCH GRID.

FIGURE 5.4.2.1-2

2, 3, 7, 8-TCDD CONCENTRATIONS IN SOILS 6-TO 12-INCH DEPTH INTERVAL

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DALLAS, TEXAS

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REVISION:
1 GENERAL REVISION 12/85

65360

DEP\DA0086235

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EXECUTIVE SUMMARY

The property located at 120 Lister Avneue in the Ironbound Section of Newark, New Jersey is a former chemical storage and shipping facility. The property formerly owned by the Sergeant Chemical Company, was vacated around September 1982. An investigation by the New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (EPA) in the spring of 1983 established that portions of the property were contaminated with 2,3,7,8-tetrachlorodibenzo-p-dioxin (dioxin), as was the adjoining property at 80 Lister Avenue. Under provisions of Executive Order 40, Diamond Shamrock undertook the initial stabilization of the property along with the 80 Lister Avenue site.

In December 1984, the state of New Jersey and Diamond Shamrock entered into an Administrative Consent Order (ACO) which requires that Diamond Shamrock perform various remedial actions in the Ironbound area. Spoils from these actions are to be stored at the 120 Lister Avenue site pending final remedial activity in the area. Preparatory to moving these spoils onto the site, Diamond Shamrock was required to perform an evaluation of the site. This report documents the findings of that evaluation.

As part of the evaluation, a work plan was prepared, submitted, and approved by the NJDEP. The field investigation to ascertain the levels of contamination in the soils, ground water, buildings, and equipment on the site was started in January 1985.

Samples were obtained of soils from the site and analysis revealed six areas with levels of dioxin in excess of 7 ppb. Three of these were excavated to levels less than 7 ppb. The other three were of such size that excavation prior to movement of off-site materials was impractical. The latter areas were capped and will be considered for remedial activity as part of the 80 Lister Avenue Remedial Action Plan.

The structures on site were found to have less than 7 ppb dioxin in the materials. Three buildings were demolished and the rubble was used as part of the fill on the site.

The equipment stored on site was decontaminated and returned to its owners with the exception of three box trailers and two scrap automobiles.

After having installed three ground water monitoring wells, the ground water was sampled and found to be free of dioxin contamination. The site was then covered with a cap consisting of geotextile fabric, sand polyethylene barrier, sand, and crushed stone. Thus, a clear surface was created for storing containerized spoils generated by remedial activities at other nearby sites. Spoil container placement began on the site on April 29,1985.

1.0

1.0 INTRODUCTION

This report presents the results of the site evaluation and site remediation activities conducted at the 120 Lister Avenue site (hereinafter "the site"). The work has been performed for Diamond Shamrock Chemicals Company (Diamond Shamrock) by IT Corporation (ITC), and its subcontractors--Woodward-Clyde Consultants (WCC) and Enviro-Measure, Inc. (EMI). This report is being submitted to the New Jersey Department of Environmental Protection (NJDEP) in response to Administrative Consent Order dated December 21, 1984 (ACO II) related to the site.

The report describes in detail all activities associated with the site evaluation and remediation activities as defined in the 120 Lister Avenue Work Plan (Section I of ACO II). Data associated with the field sampling and testing and analytical laboratory testing are presented, and these data are subsequently used to characterize the site with respect to the presence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) and the U.S. Environmental Protection Agency (EPA) priority pollutants plus 40 tentatively identified nonpriority pollutants in the volatile organic analysis, base/neutral, and acid fractions for each sample analyzed. The following paragraphs describe the main sections of the report in more detail.

Section 2.0 presents the history of the site from its earliest known use as an industrial site to its current condition.

Section 3.0 presents a brief summary of the regional environmental setting of the site. References is made to Section 3.0 of the 80 Lister Avenue Site Evaluation Report which presents this information in detail.

The evaluation program conducted at the site is defined in Section 4.0. This includes a description of general activities such as industrial hygiene, sample handling and documentation, quality assurance/ quality control (QA/QC), and the analytical laboratory methods used. Reference is made to the Work Plan which is provided in Appendix H of this report. The specific sampling methodology used for equipment, buildings, soils, ground water, drums, utilities, etc. is also provided. All instances of deviation from the procedures defined in the Work Plan are carefully documented.

Section 5.0 presents the data obtained from the site evaluation program. Generally, the data are presented in the form of summary tables with the complete data presented in appendices to the report. This chapter is organized in a manner similar to Section 4.0, where the various sampling and analytical methods are described.

Section 6.0 provides a description of site remediation activities performed on the basis of the site investigation. The modification of the site and construction activities associated with preparing the site to receive storage containers is also described. The storage containers will be filled with possibly contaminated materials collected from properties in the near vicinity of the 80 and 120 Lister Avenue sites.

References, tables, and figures for each chapter are provided at the end of that chapter. Tables and figures are numbered sequentially according to the section of the text in which they are first referenced. For example, the first two tables referenced in Subsection 2.6.2 would be 2.6.2-1 and 2.6.2-2. Appendices are presented sequentially at the end of the report and are identified by letters (Appendix A, Appendix B, etc.). A list of the material contained in each appendix is provided at the beginning of that appendix. The report Table of Contents is provided at the front of each of the volumes of the report.

2.0

2.0 SITE HISTORY AND EXISTING CONDITIONS

2.1 SITE LOCATION

The 120 Lister Avenue site is located in the Ironbound section of Newark, New Jersey. The site occupies approximately 2.2 acres on the north side of Lister Avenue. It is nearly rectangular in shape, extending about 240 feet in an east-west direction and 390 feet north-south. The site is bounded on the north by the Passaic River, on the east by Hilton-Davis (Thomasett Colors), on the south by the Duralac Company and SCA Chemical Services Company properties, and on the west by the 80 Lister Avenue property owned by Marisol. Vehicular access to the site is via a right-of-way through the SCA Chemical Services Company's property which enters the southeast corner of the site.

The location of the site within Newark and the Ironbound section is shown on the accompanying maps (Figures 2.1-1 and 2.1-2).

2.2 SITE HISTORY

Industrial development on the 120 Lister Avenue site is reported to date from the 1870s. Drawings from 1914, revised in 1922, show the site to be part of the Lister Agricultural Chemical Company property which extended for some distance along the Passaic River. This plant site also included most of the nearby existing industrial sites.

It was during the period of ownership by Lister that the site reached its present dimensions following filling along the south shore of the Passaic River to form the northernmost 30 percent of the property (Figure 2.2-1). Much of the remainder of the site is also filled with the granular material used to fill the marsh land that existed in the natural state.

When Lister Agricultural Chemical Company ceased operations, the property was subdivided largely along the lines that form the present property boundaries and was sold.

During the period of ownership by Diamond Alkali and subsequently Diamond Shamrock (from March 1951) of the adjoining 80 Lister Avenue property, Sergeant Chemical Company owned the 120 Lister Avenue property. The site was

comprised of several major structures, including a brick building, a block building, and a tile building. The site was used by Sergeant to store, repackage, and distribute a variety of small-lot-quantity organic and inorganic chemicals.

In November 1963, Diamond leased the parking lot from Sergeant. The lease was terminated when Diamond ceased production operations on the 80 Lister Avenue site in 1969.

In recent years, the 120 Lister Avenue site was leased by SCA Corporation for the storage of vehicles and equipment required to support the manufacturing operations on the adjacent piece of property.

In June 1983, results of samples taken by the U.S. EPA showed positive levels of dioxin on the site and the NJDEP moved to control access to the property. Results of the sampling effort are summarized in Table 2.2-1 and sampling locations are shown in Figure 2.2-2.

In mid-1984, Diamond Shamrock purchased the property from Sergeant Chemical Company. Diamond Shamrock entered into an administrative consent order (ACO II) with NJDEP in December 1984. The order requires Diamond Shamrock to secure the site, determine the degree of contamination, and prepare the site to receive and store all nearby off-site material possibly contaminated with dioxin.

2.3 SITE PROTECTION

An investigation conducted by NJDEP in June 1983 confirmed dioxin contamination within the 120 Lister Avenue site boundaries. Following the discovery of dioxin on the site, Diamond Shamrock, at the direction of the NJDEP and EPA, took initial measures to control access to the property and reduce the possibility of dioxin-contaminated material leaving the property. The principal measures were:

- A fence was installed around the property, including the river front.
- An around-the-clock security guard was placed at the only gate providing access to the property. The duty

of the guard is to control entry onto the premises and restrict it to authorized personnel.

- The entire site, excepting areas covered by buildings and equipment, was initially covered by a permeable geotextile fabric (Amoco No. 2002 polypropylene stabilization fabric). This fabric was weighted down by concrete blocks to prevent movement by wind.

- The entire site, including the areas which were floor slabs for buildings, has been prepared for the acceptance of containers of spoils originating off site which are being stored on site.

Some portions of the fabric were disturbed during the sampling for the site evaluation field investigation. Repairs were made immediately to reestablish the protective integrity originally provided for the site.

2.4 SITE INVESTIGATION

Diamond Shamrock entered into ACO II with the NJDEP on December 21, 1984 for the preparation of 120 Lister Avenue to receive the containers of spoils originating off site. The order requires that Diamond Shamrock undertake certain actions to secure the site, prevent exposure to contaminants, and prepare the site to receive containers of spoils originating from other off-site locations by conducting a site investigation and taking any necessary remedial actions to reduce dioxin contamination below the acceptable level of 7.0 parts per billion (ppb).

Diamond Shamrock submitted a Work Plan to the NJDEP on December 28, 1984. Tentative approval of the Work Plan was given on January 3, 1985. Subsequently, NJDEP approved the final Work Plan on January 18, 1985 and it is being implemented. Mobilization of equipment and personnel to the site along with initial remedial activities commenced January 2, 1985. The actual investigation/sampling effort began on January 7, 1985 and is currently ongoing. Activities concerning the drums, tanks, tankers, and other equipment were conducted from February 18, 1985 through March 24, 1985. "Hot Spot" excavation and backfill was conducted from March 9, 1985 through April 2, 1985. Preparations for the site to receive containers were started March 1, 1985 and the site was ready to start stacking containers on April 21, 1985. Containers are scheduled to be completely in place on or before May 15, 1985.

TABLES

TABLE 2.2-1

SERGEANT PROPERTY DIOXIN RESULTS
INITIAL SAMPLING - 6/2/83 - DEP

SAMPLE NO.	LOCATION	SAMPLE TYPE	DIOXIN CONCENTRATION (ppb)
167	"A"	soil	13
168	"B"	soil	1.2
169	"C"	soil	.91
172	"D"	soil	1.4
173	"E"	soil	ND
174	"F"	soil	.83
175	"G"	soil	15

NOTE: Sample locations are provided in Figure 2.2-2.

FIGURES

State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection

Robert C. Shinn, Jr.
Commissioner

TO: Pat Ramm

FAX #: (609-450-6119

DATE: 3/29/96 NUMBER OF PAGES 4 (inc. cover)

FROM: NL Marsden

BUREAU OF BFCM

PHONE: _____ FAX: (609) 633-1454

COMMENTS: _____

ADM-019
7/94

Department of
Environmental Protection

Date 3.26.96 Time 1:27 PM.

To Pam Lange.

☒ You were called by ☐ You were visited by

Patrick Ramm.

Phone No. 800-733-7606 ext 119.

☒ Please call ☐ Will call you ☐ Returning your call

☐ Waiting to see you ☐ Wishes an appointment

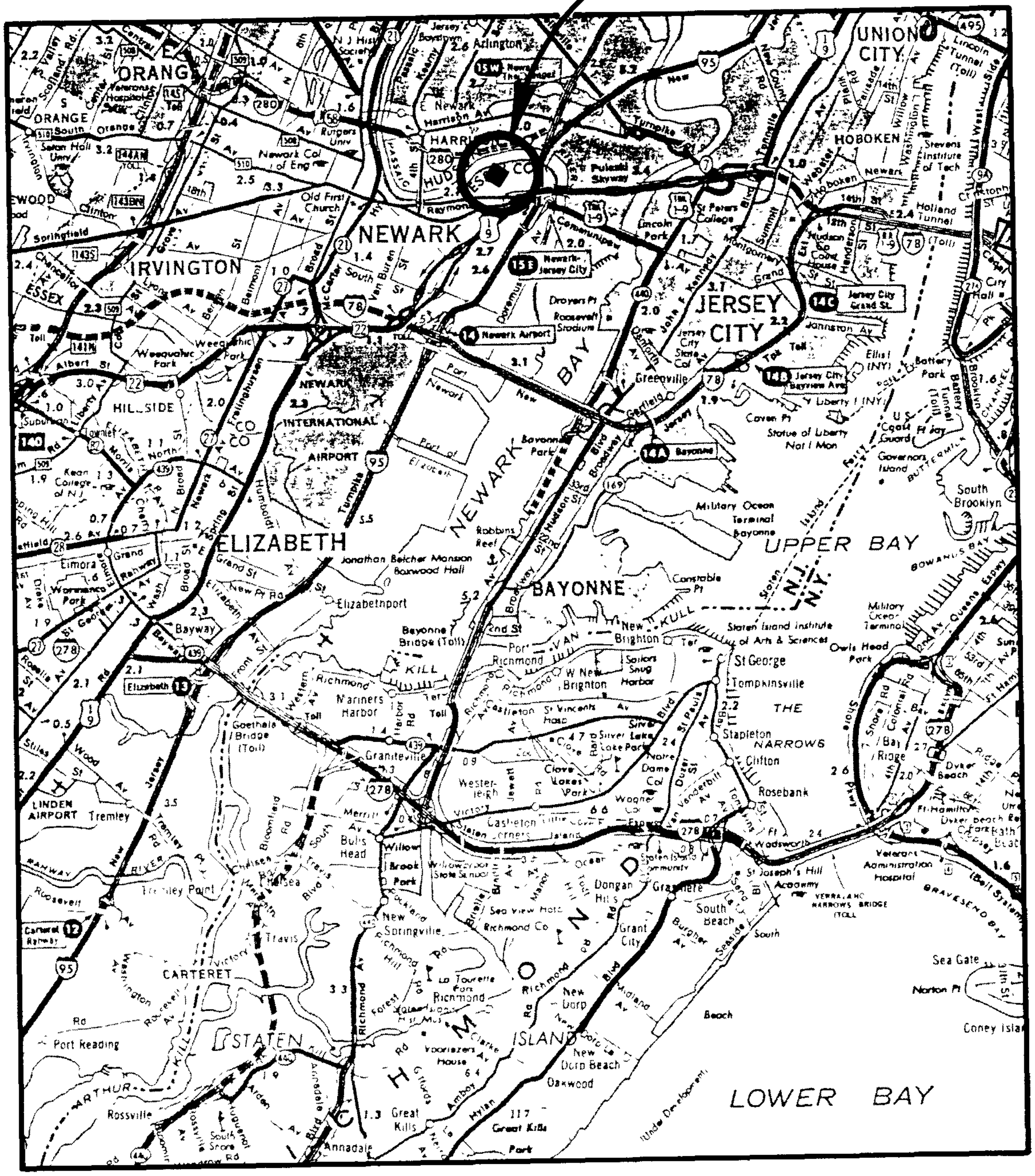
MESSAGE:

Ref to Diamond McKalide Co.

Wants to obtain the Silt map.

Call taken by BL.

DRAWN BY cjb 4-17-85 | CHECKED BY ND 5-1-85 | APPROVED BY DHE 5-1-85 | DRAWING NUMBER 846722-A18



ROAD CLASSIFICATION:

HEAVY DUTY

MEDIUM DUTY

LIGHT DUTY

UNIMPROVED DIRT

INTERSTATE

STATE ROUTE

U.S. ROUTE

FIGURE 2.1-1

120 LISTER AVENUE SITE LOCATION

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"Do Not Scale This Drawing"

DRAWN BY	CHECKED BY	DRAWING NUMBER
D. Weick 4-17-85	ND 5-1-85	846722-A24
	APPROVED BY	
	DWE 5-1-85	

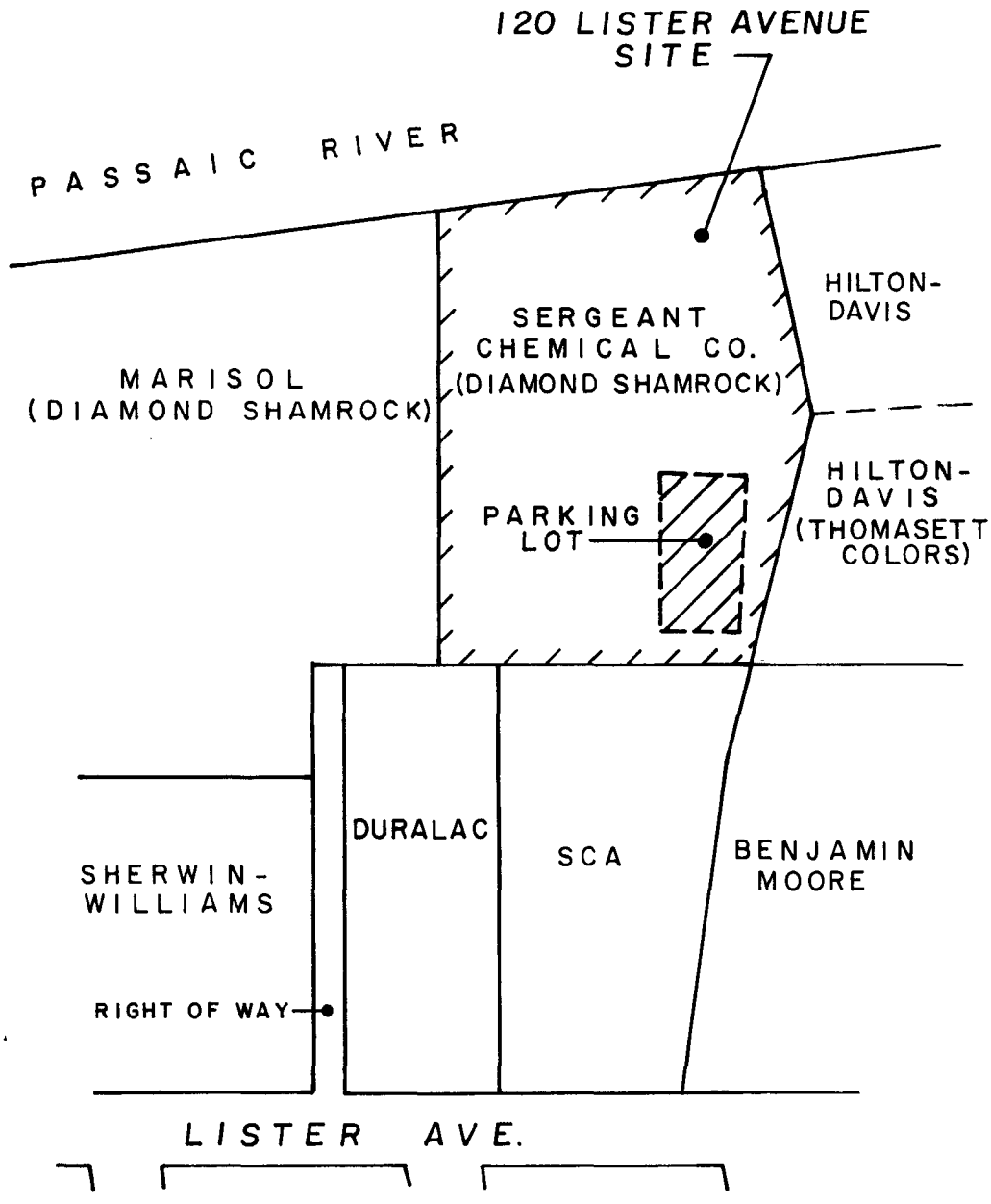

FIGURE 2.1-2

PLOT PLAN FOR 120 LISTER AVE. AND ADJACENT PROPERTIES

PREPARED FOR

DIAMOND SHAMROCK
DALLAS, TEXAS

REFERENCE:

DIAMOND ALKALI COMPANY
DWG. NO. 2NS-583-
TITLED: REAL ESTATE PROPERTY

65360

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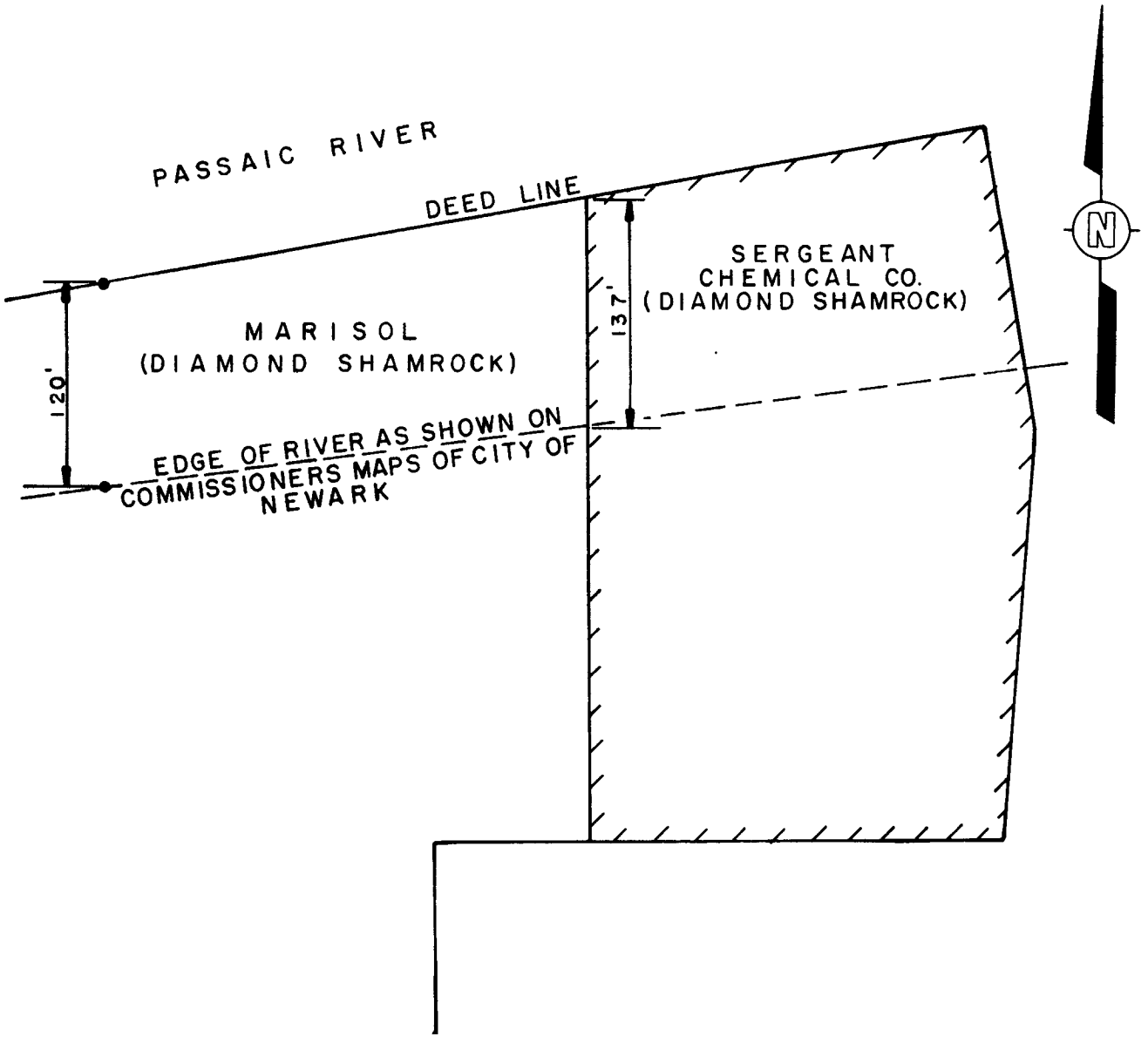

DRAWN BY	CHECKED BY	DRAWING NUMBER
D. Weick 4-17-85	MD 3-1-85	846722-A23
	APPROVED BY DHE 5-1-85	

SCALE

0 100 200 FEET

FIGURE 2.2-1

PROPERTY LOCATION MAP

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DALLAS, TEXAS

65360

"Do Not Scale This Drawing"

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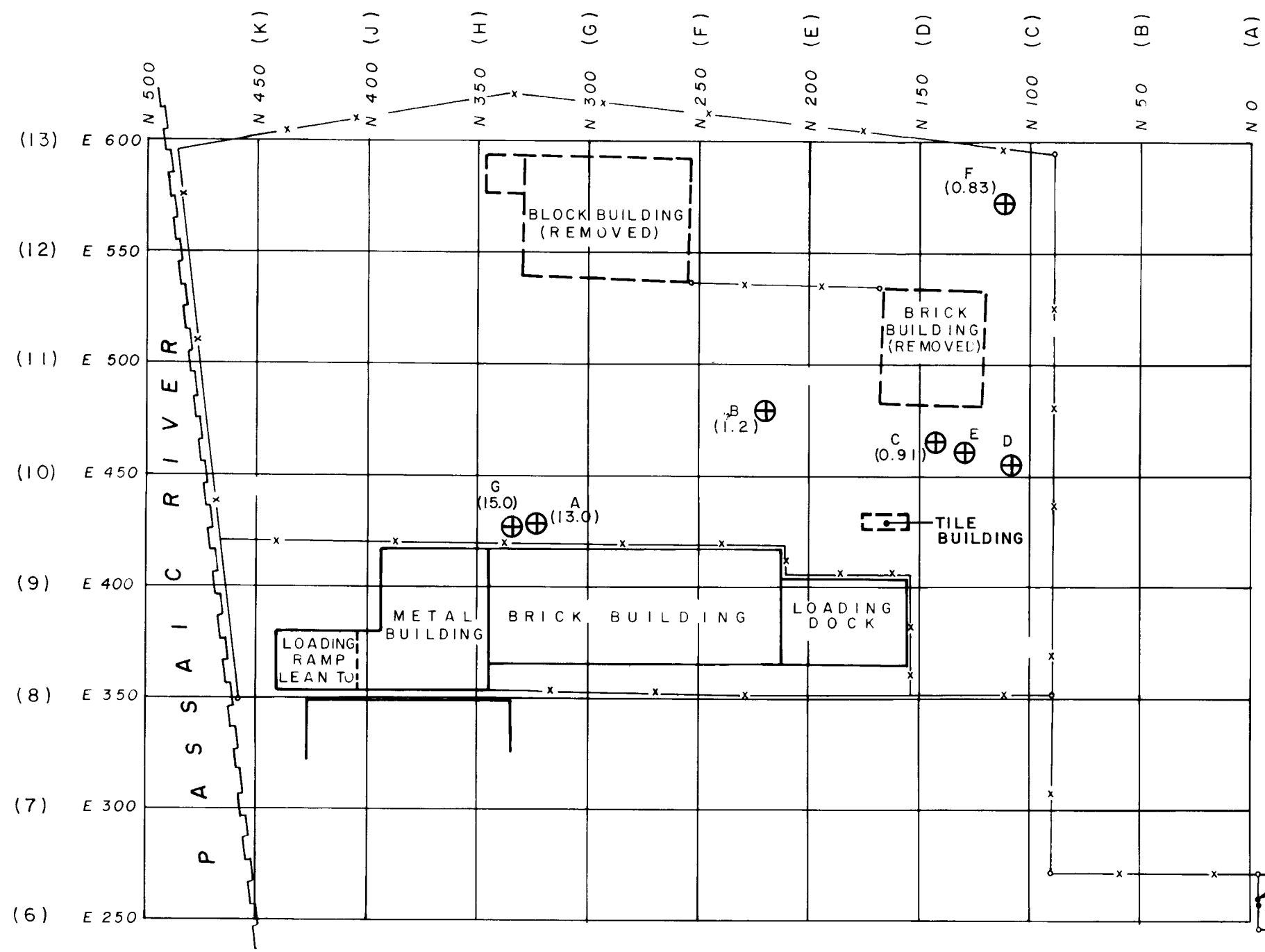
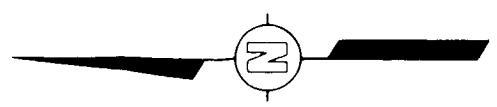
DRAWN BY	J. LOGRECO
CHECKED BY	M.D.
APPROVED BY	DHE
DATE	5-1-85
DRAWING NUMBER	846722-B10
100% ORG	7





LEGEND:

C ⊕	NEAR SURFACE SOIL SAMPLE AND LOCATION LETTER
(0.91)	INDICATES 2,3,7,8-TCDD CONCENTRATION IN SOILS (ppb)

SCALE

0 60 120 FEET

NOTE:

SAMPLE LOCATIONS HAVE BEEN APPROXIMATED

FIGURE 2.2-2

SURFACE SOIL SAMPLES TAKEN IN JUNE 1983

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3.0

3.0 REGIONAL SETTING

3.1 INTRODUCTION

This chapter of the report provides a brief summary of conditions at the 120 Lister Avenue site and in the site vicinity. The following characteristics have been included and more detailed information on each is contained in the 80 Lister Avenue report:

- Climate and meteorology
- Geology and landforms
- Hydrology
- Flora and fauna.

3.2 CLIMATE AND METEOROLOGY

Climatic and meteorological conditions at the site have been characterized on the basis of weather records available from the National Weather Service at Newark Airport. The airport is located approximately three miles southwest of the site and should be representative of conditions at the site. The climate in this area is humid and typified by moist, warm summers and moderately cold winters with winds of moderate velocity. Prevailing winds are from the southwest, with only small variations in direction. Mean wind speeds are generally highest (10 to 12 miles per hour) during the winter and spring and lowest (8 to 9 miles per hour) during the summer. The average annual temperature in the area is about 54 degrees Fahrenheit and the average annual precipitation is approximately 41 inches.

3.3 GEOLOGY AND LANDFORMS

The site is situated in the Piedmont Lowland Section of the Piedmont Physiographic Province. In the vicinity of the site, the Piedmont Lowland Section is underlain by both igneous and sedimentary rocks of Triassic-Jurassic Age. The igneous rocks are generally more resistant and form hills and ridges in the area while sedimentary rocks occur in the lower-lying areas. The site is located in a low-lying area atop sedimentary deposits.

The bedrock underlying the site is the Passaic Formation, which is more commonly known as the prebasalt portion of the Brunswick Formation. The formation consists chiefly of soft, red shale and sandstone. Overlying the bedrock are deposits of silts, sands, and gravel laid down by glacial meltwater during the Pleistocene.

3.4 HYDROLOGY

The site is located in the Lower Valley portion of the Passaic River drainage basin. The Lower Valley is characterized as a flat, relatively narrow floodplain of 1,000 to 2,000 feet in width which abuts low, rolling hills. In the area between Dundee Dam and Newark Bay, which includes the site, the Passaic River is a navigable, tidal estuary. The mean tidal range is about 5.1 feet. The potential for flooding in the site area is controlled more by tidal influences than by rainfall as is the case with upstream, nontidal portions of the Passaic River. The greatest potential for inundation in this area occurs from the storm surge and tidal flooding associated with a major storm. According to the U.S. Army Corps of Engineers, flood elevations for the 10-, 50-, 100-, and 500-year tides are 7.5, 9.3, 10.2, and 12.8 feet above Mean Sea Level (MSL), respectively.

Regional aquifers in the site vicinity include the bedrock of the Brunswick Formation and the unconsolidated glaciofluvial sand and gravel deposits of Pleistocene Age. The Brunswick Formation, particularly the shales and sandstones, is the principal source of ground water in the region since the unconsolidated sand and gravel deposits are of limited extent. Water in the Brunswick Formation in the site vicinity is generally confined or semiconfined by glacio-lacustrine clay and, in many areas, is under artesian pressure. However, since the area around Newark has been extensively pumped, the artesian pressure has been reduced and in some parts of the aquifer pumping has resulted in dewatering to the extent that the aquifer no longer behaves as confined.

Ground water in the bedrock moves primarily through a system of joints and fractures and bedrock wells often draw water from more than one water-bearing zone. Wells in the area are quite deep, often 400 to 600 feet below ground surface. The best producing wells are 300 to 400 feet deep. Bedrock ground water yields range from 35 to 820 gallons per minute for shales and sandstones and from 7 to 400 gallons per minute for basalts. Although the quality of the bedrock ground water is generally good, salt water intrusion has occurred in the site vicinity as a result of heavy pumping. Additionally, heavy pumping has greatly lowered water levels in the area.

As previously indicated, the glacio-fluvial sands and gravels constitute an aquifer of limited extent. Wells yielding between 175 and 600 gallons per minute have been developed in those deposits, but pumping from the aquifer has been in excess of fresh water recharge and, as a result, salt water intrusion is occurring.

3.5 FLORA AND FAUNA

The predominant floral and faunal elements in the site vicinity are associated with nearby tidal marshes and the Passaic River. Vegetation in the marshes consists primarily of reed (Phragmites australis) and other typical wetland species such as cattail (Typha augustifolia) and bulrush (Scirpus americana). The Passaic River contains a wide variety of aquatic life; however, the state of New Jersey prohibits the sale or consumption of fish and shellfish from the area between the Dundee Dam and Newark Bay. The site is located in this area. No unique or endangered species or habitats are known to occur at the site or in the surrounding vicinity.

3.6 LAND USAGES

The site is located in an area of Newark that has been used for heavy industry for over 100 years. This usage is reflected in the Newark Master Plan and future land use objectives for the area involve industrial activities. The nearest residential zone is located approximately one-quarter mile from the site.

4.0

4.0 SITE INVESTIGATION

A comprehensive field investigation and sampling program was developed for the site evaluation. Major considerations in the development of the program included: sampling and analytical testing methodologies; sample collection, handling, documentation, and transportation; initiation of a health and safety program to protect project personnel and the general public; and QA/QC protocols.

The selection of specific sample locations for soils, buildings, and structures was based on a 50-by-50-foot grid and some randomly selected sample locations. This sampling program is specified in the Work Plan developed for the site (Appendix H). A plan of the site showing major buildings and facilities and other physical features is provided in Figure 4.0-1.

A variety of sampling activities were performed to characterize the levels of chemical contamination at the site and to meet required health and safety and QA/QC requirements. These included:

- Ambient air samples
- Industrial hygiene samples
- Chip and wipe samples from existing buildings, tanks, piping, and equipment
- Samples of soil
- Samples of ground water
- Samples of on-site drums.

Because of the large number of samples collected during the field investigation, a designation system was developed to provide unique identification information for each sample, including:

- The location from which the sample was taken. Locations were identified either by a coordinate for soil and ground water samples or by a series of numbers for wipe, chip, air, and drum samples.
- The position in the numerical sequence of samples taken. Four digits are provided for this number.

- The sample type (matrix).
- The destination of the sample when shipped from the site.

A site grid coordinate system was developed to facilitate the location of field sampling points. Grid lines were assigned letters and numbers to provide a means of quickly identifying the area of origin of a particular sample. Further, each 50-by-50-foot grid square was subdivided into sixteen 12.5-by-12.5-foot squares, lettered "A" to "P," as shown in Figure 4.0-2. For samples taken outside of site structures, the first two characters of their designation defined the 50-by-50-foot grid location and the third character defined the 12.5-by-12.5-foot subgrid. It is noted that in a few cases when some of these locations were surveyed after sampling, they did not always exactly correspond to the first three sample designation characters. Slight modifications were made to sampling locations based on accessibility and material encountered at a particular location. Changes were noted in the field sampling log and measurements taken to accurately locate the sampling point.

When sampling occurred within structures, the locations were identified by a four-digit number. The first digit identified the structure, and the remaining three digits identified specific zones within the structure.

Sequential letters were assigned to each drum. Most of the drums were located in a box trailer and have subsequently been removed to the 80 Lister Avenue site for further remediation.

The four-digit sample location numbers were assigned by the Sampling Coordinator before sampling personnel were sent into an assigned area, and this information was recorded in a field log notebook.

Additional information detailing sample identification procedures is provided in Appendix A - Site Evaluation, 80 Lister Avenue, February 1985.

Key project personnel and their major duties and responsibilities during the site investigation included:

- Field Operations Manager - Overall supervision of daily field activities, client and regulatory agency liaison, and responsibility for adherence to programs and schedules.
- Site Manager - Administration of site personnel and equipment, supervision of equipment, and materials purchases and maintenance.
- Sampling Coordinator - Supervision of sample handling staff and responsibility for maintaining proper sample handling techniques, sample shipment, and documentation of sample records.
- Task Supervisors - Supervision of field personnel assigned to specific tasks (i.e., chip samples, drums, near-surface soil samples, etc.) and responsibility for field documentation of these tasks.
- Site Health and Safety Coordinator - Responsibility for the administration of on-site health and safety programs, personnel monitoring, and decontamination procedures.
- QA Program Manager - Responsibility for supervision and documentation of QA/QC program.

Analytical testing for the project was performed at the following laboratories by the IT Analytical Services (ITAS) division of IT:

Location	Testing
ITAS-Directors Drive Laboratory Knoxville, Tennessee	Dioxin
ITAS-Middlebrook Pike Laboratory Knoxville, Tennessee	Inorganics (metals, cyanide, phenols); Base/Neutral/Acid (BNA) Priority Pollutants plus 25
ITAS-Cerritos Laboratory Cerritos, California	Volatile Organic Priority Pollutants plus 15
ITAS-Santa Clara Laboratory Santa Clara, California	Pesticides, Herbicides, and Polychlorinated Biphenyls (PCBs)

4.1 GENERAL PROGRAMS

4.1.1 Industrial Hygiene

The health and safety program for the site evaluation field investigation included the preparation of the following plans and procedures:

- A Community Public Health Preservation Plan which outlined steps to prevent potential contamination from leaving the site, with telephone numbers of agencies to contact in the event of an emergency;
- A Worker Health Protection Plan which required that all on-site personnel complete a preemployment medical examination and/or a periodic update examination prior to entry to the site. This plan also included procedures to be followed for return to work after an injury or illness;
- A Health and Safety Plan which outlined the health and safety responsibilities, permissible exposure limits for contaminants on site, potentially contaminated and clean site areas, training requirements, employee decontamination procedures, personal protective equipment requirements, atmospheric and physical monitoring requirements, general work practices, methods to control heat stress, and drum opening procedures;
- A Site Security Plan to prevent unauthorized people from gaining access to the site;
- A procedure to comply with the New Jersey Worker and Community Right to Know Act;
- An Emergency Action Plan which provided detailed procedures in case of an accident or illness on site;

At least one industrial hygienist was on site at all times to coordinate the health and safety program.

4.1.2 Sample Handling and Documentation

The Standard Operating Procedure (SOP) developed for sample handling and documentation in the 80 Lister Avenue site assessment was used for the 120 Lister Avenue assessment and remediation work (Appendix A, 80 Lister Avenue Site Evaluation, February 1985). The primary modification to the existing plan was the addition of a fourth ITAS laboratory, ITAS-Santa Clara, where all

pesticide/herbicide/PCB sample analyses were performed. Table 4.1.2-1 outlines the analyses required and designated analysis laboratories for each sample type.

A brief summary of sample handling and documentation procedures is provided in the following paragraphs.

Each day's sample collection was planned in advance by the Field Operations Manager. The Sampling Coordinator then assigned an alphanumeric code designation to each sample and entered them into the Master Sample Collection and Shipping Log. The code designation indicated: sample origin (relative to the site grid), sample type, depth (where appropriate), and laboratory destination(s). Each sample collected was logged into a field log notebook by the person obtaining the sample. A label with the alphanumeric code was attached to the page describing the sample collection.

A Chain-of-Custody record was also initiated at the time of collection by the Sampling Coordinator. When the samples were transferred across the decontamination line to the Sample Handling staff, appropriate entries were made on the Chain-of-Custody records. The Sample Handling staff, under the direction of the Sampling Coordinator, verified collection of each sample in the Master Sample Collection and Shipping Log and packed the samples for shipment to the appropriate laboratories. They also prepared Request for Analysis forms, updated the Chain-of-Custody forms, and shipped the samples to the laboratories with these forms.

Samples collected each day were shipped via overnight carrier for delivery the next day to the analytical laboratories. At the laboratories, the samples were tracked and documented under the routine procedures for each facility. Analytical results were transmitted to the project Analytical Coordinator.

Detailed information concerning sample handling, identification, and documentation procedures specific to the 120 Lister Avenue site will be provided in the final off-site evaluation report, to be issued in July 1985.

4.1.3 Analytical Quality Assurance/Quality Control

The Quality Assurance (QA) Project Plan developed for the 80 Lister Avenue site evaluation was similarly applied to the 120 Lister Avenue assessment/ remediation work. The QA plan reflected appropriate EPA guidelines and presented QA objectives for accuracy, precision, completeness, representativeness, and comparability of the analytical data. Specific QC procedures necessary for protection and verification of sample integrity during collection, preparation, and analysis were described, and details of data validation, reduction, and reporting were also presented.

The following subsections describe the project requirements for collection of field and trip blanks, sample preservation and shipment, preparation of sample containers, and the QC checks performed by each participating laboratory.

4.1.3.1 Field and Trip Blank Requirements

For this project, a field blank was defined as laboratory-pure water poured over a piece of sampling equipment and caught in an empty sample container on site. A field blank was obtained by a sampling team member immediately prior to the start of each day's collections. The water and containers for field blanks were provided daily to the sampling teams by the Sampling Coordinator, who received them from the Middlebrook Pike laboratory.

Trip blanks consisted of laboratory-pure water provided to the sampling teams in sealed sample containers; the containers were filled at the Middlebrook Pike Laboratory, labeled by the on-site Sampling Coordinator, and issued daily to the sampling team. They were handled in exactly the same manner as the field samples, but the containers were not opened on site for any reason.

The frequency requirement requested by the NJDEP for field and trip blanks was one field blank and one trip blank per day. Blanks associated with soil samples assigned for analysis of all EPA priority pollutant (PP) parameters were routinely analyzed for volatile organics only. Blanks collected in association with soil samples designated for dioxin analysis were analyzed for dioxin only. Blanks associated with ground water samples were analyzed for all EPA PP parameters. An overall goal of five percent of the total number of samples collected was established as the collection frequency for routine field and trip blanks.

Field blanks associated with chip sampling were assigned in a similar fashion, but were analyzed for dioxin only. Field blanks associated with wipe samples consisted of a clean wipe which was soaked with solvent on site and placed in a prepared container; these were also analyzed for dioxin only.

4.1.3.2 Sample Preservation and Shipment

Because of the potential for dioxin contamination, most site samples were packaged and shipped as "Poison B," which made it impossible to refrigerate them between collection and arrival at the laboratories. Therefore, all samples for which Poison B packaging was required (Table 4.1.3.2-1) were not refrigerated until they were received at the laboratories. Samples designated nonhazardous were shipped in ice chests under cooled conditions.

Other preservation techniques were performed prior to sample collection as work assignments were made. These are defined in Table 4.1.3.2-2.

4.1.3.3 Sample Container Preparation

All sample containers used at the site were supplied by the Middlebrook Pike laboratory. The containers were cleaned prior to shipment to the site according to the procedure described in the Work Plan for 80 Lister Avenue. Experience with the thorough container QC check analyses performed for the 80 Lister Avenue site evaluation has shown that the cleaning methods used for container preparation are quite satisfactory in removing organic and inorganic residues: no contamination of the containers was detected in any of the container check analyses.

Therefore, container QC was minimized for this phase of the project and consisted of spot-check analyses for various parameters, performed at the Middlebrook Pike laboratory. Records detailing preparation dates, analyses performed, and final results verifying container quality were filed with the project data.

4.1.3.4 Laboratory Quality Control Checks

Samples collected from the site were shipped directly to one or all of the four participating ITAS laboratories for analysis. EPA Contract Laboratory

Program (CLP) methods were used for analysis of dioxin and the organic priority pollutants, with stated modifications in the case of the dioxin analyses. Herbicides, metals, cyanides, and phenols were analyzed by standard EPA methods.

Similar laboratory QC check frequency requirements were used at each facility throughout the investigation. As a minimum, for each group of 20 samples received of a particular matrix, a laboratory method blank, a blind sample split, and a sample spike or blank spike were analyzed. For all organic analyses (dioxin, volatiles, and semivolatiles), internal and surrogate standards were added to each sample to monitor instrument performance and method recovery. For all analyses, reference standards were run at least once during every eight-hour shift. Table 4.1.3.4-1 summarizes the QC check requirements for each sample matrix and analysis.

4.1.3.5 NJDEP-Designated Quality Control Checks

The NJDEP On-Scene Coordinator (OSC) directed the selection of samples to be split at the time of collection for independent analysis by NJDEP and IT. A split frequency of five percent of all samples collected was established by NJDEP.

The NJDEP OSC also provided EPA proficiency samples for dioxin analysis; these soil samples were assigned unique label numbers and sent to the analytical laboratory using the same procedures as for routine site samples.

4.1.3.6 Corrective Action

Results for QC check samples (in particular, field and trip blanks) were reviewed, as available, over the course of the project. Corrective actions were taken on an as-needed basis, such as reanalysis or reextraction of samples and resampling some locations when field blanks indicated potential contamination.

4.1.4 Analytical Methods

The methods used for the analysis of samples were either EPA or other approved analytical procedures. These methods were presented in detail in the 80 Lister Avenue Work Plan and significant modifications were not required.

Table 4.1.4-1 presents the matrices and the analytical parameters for which analysis was performed. Table 4.1.4-2 lists the analytes for each analysis.

As referred to in this report, priority pollutants are the organic BNA analysis, volatile organic compounds (VOC) analysis, pesticides and PCBs analysis, herbicide analysis, metals analysis, total cyanides, and total phenols. The BNAs, VOCs, pesticides, and PCBs were analyzed according to the EPA CLP organic analysis requirements. Additionally, 40 extraneous peaks in the BNA and VOC analyses were library searched. All results were produced and reported according to the CLP protocols. The herbicides, metals, total cyanide, and total phenols were analyzed by EPA (1979, 1982) methods for waste analysis.

Dioxin was analyzed according to EPA protocols for dioxin in soils. Appropriate modifications were made for analyses of matrices other than soils. Detailed procedures are provided in the 80 Lister Avenue Work Plan.

Surface site water was also sampled and analyzed during the 120 Lister Avenue assessment/remediation. In addition to dioxin, the water was analyzed for Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Organic Carbon (TOC), and Total Suspended Solids (TSS) as part of the predisposal activities. These analyses were performed according to the EPA 600 Series, Methods for Chemical Analysis of Water and Waste, March 1979. Individual methods used are as follows:

BOD 405.1
COD 410.2
TOC 415.1
TSS 160.1.

Drum samples were tested for hazardous categorization (Hazcat), which is a series of physical property tests that evaluate water reactivity and solubility, vapor pressure, pH, presence of oxidizable materials, presence of peroxides, open-cup ignitability, and open-cup flash point. These tests are semiquantitative, for compatibility determinations, as part of the predisposal activities. In addition to the characterization/compatibility testing, Extraction Procedure (EP) toxicity (metals and pesticide/herbicides) and PCB screen analyses were performed on each drum sample.

As part of ACO II, compounds listed in Appendix B of the Off-Site Work Plan were requested for analysis. Of the 26 individual or groups of compounds identified in this list (Table 4.1.4-3), 13 were analyzed as part of the priority pollutant analyses. Due to lack off authentic standards and analytical methods for a significant number of the Appendix B compound, clarification (February 4, 1985 Wojinski to Genicola) was requested. Final resolution has not yet been made as of this report, therefore, only those compounds analyzed as part of the priority pollutants are reported at this time.

In general, samples from the site were analyzed for dioxin regardless of the concentration or background interference. Every effort was made to achieve a clear definable result. Sample results which exceeded the linear range of the instrument were not reanalyzed because action on the site was based solely on whether the results were above or below the designated acceptable dioxin level of 7.0 ppb.

4.2 SAMPLING, MONITORING, AND PHYSICAL TESTING

4.2.1 Ambient Air

Ambient air sampling was conducted on the 120 Lister Avenue site to assess airborne dioxin concentrations during site operations. Site activity began on January 10, 1985, with the removal of the geotextile fabric cover. At that time, two ambient air sampling stations were established in the northeast and southwest areas of the site. On March 25, 1985, a third ambient air sampling station was installed on the east side of the site. The additional sampling location was initiated in response to increased site activities and the observation of winds prevailing from the west.

Ambient air samples and on-site meteorological data were collected continuously except during periods of equipment malfunctions or power failure. Individual air samples were typically collected for at least 24 hours. To ensure continuous sampling, some sample durations extended three to five days. This occurred over weekends when there was no physical activity on the site or when qualified personnel were not available to change the samples.

Polyurethane foam (PUF) samplers, Model PS-1, manufactured by General Metal Works, Inc., were utilized for the collection of air samples for dioxin analysis. Ambient air was drawn into a covered housing and through a dual-chambered aluminum sampling module. The upper chamber of the sampling module supported a four-inch-diameter glass fiber filter used for collecting airborne particulates. The lower chamber consisted of an enclosed glass cartridge containing a 60-mm-diameter by 75-mm-long cylindrical PUF plug for vapor entrapment. The sampling flow rate was approximately 0.25 cubic meter per minute. The PUF sampler was equipped with a calibrated venturi and magnehelic gage to measure flow rate, a voltage variator to adjust blower motor speed, and an elapsed-time indicator to accurately record sampling time period. Concentrations of dioxin (2,3,7,8-TCDD) were computed by measuring the total mass of dioxin collected and the total volume of air sampled. Figure 4.2.1-1 is a schematic diagram of the PUF sampler.

A Climatronics Mark III meteorological instrument for monitoring wind speed and wind direction was installed on top of the on-site laboratory trailer, at an elevation of approximately seven meters above ground level. Operation and alignment of this instrument were checked daily. In addition to the site data, ambient temperature, barometric pressure, sky cover, precipitation, and wind speed and direction were requested from the National Weather Service Station WSO (Newark, New Jersey) which is located three miles southwest of the site. Data from the National Weather Service are not included in this report because they have not been received at this date.

4.2.2 Industrial Hygiene

The following industrial hygiene samples were taken during the field investigation:

- Atmospheric Samples for Dioxin - A total of six samples were taken through April 2, 1985 including one blank. These samples were primarily personnel samples to define potential employee exposure and required respiratory protection.

- Wipe Samples for Dioxin - A total of nine wipe samples were taken. Some of these samples were taken to determine clean levels after equipment had been decontaminated. Six of the samples were taken in the employee decontamination area.

- Heat Stress Measurements - Heat stress was measured continuously on days of concern to establish a work-rest regimen to help prevent heat stress related illnesses.

- Noise Measurements - Noise readings were taken at the drill rigs to determine if hearing protection was required.

- Drum Openings - Continuous air monitoring was performed with a combustible gas indicator and photoionization detector during all drum openings. If levels exceeded established guidelines, the work was stopped until levels were reduced.

4.2.3 Buildings, Tanks, Trailers, and Equipment

Buildings, tanks, trailers, and equipment located on the 120 Lister Avenue site at the start of the investigation were sampled and analyzed as part of the comprehensive site evaluation to determine the extent of contamination on site and to allow preparation of the site to receive containers of spoils originating off site.

Six chip samples were collected from the interior walls, exterior walls, floor, and roof of each of the three buildings using an electric percussion hammer equipped with a serrated one-inch bit and following procedures established in the 80 Lister Avenue Work Plan. Each interior and exterior wall sample was a composite of two vertical chips, ground level to approximately six feet in height, one from each of the two walls forming the corner indicated in the sample description. Water was sprayed as needed to help keep the dust down at the sampling locations.

Thirty-one wipe samples were taken from the tanks, trailers, equipment, and assorted hardware and supplies located on site after washing as prescribed in the Work Plan; each sample was a composite of two wipes, either from two locations on the same structure or from separate structures. Sixteen of the wipes were scheduled for immediate dioxin analysis to determine if the equipment had been sufficiently decontaminated for removal; the fifteen remaining samples are under archive on site. The wipe sampling procedure followed was that described in detail in the 80 Lister Avenue Work Plan, including a 2,500 square centimeter sampling area.

4.2.4 Soils

Drilling activities consisted of drilling five deep borings (from 16.5 to 81.5 feet) in the fall of 1984 and 18 shallow borings (from 2.0 to 12.5 feet) in January and February of 1985. Four of the 18 shallow borings were drilled at locations on 120 Lister Avenue selected by the NJDEP and field located during the time period from January 15 through 18, 1985. These borings were designated B-101 thorough B-104. After the four initial borings were completed, it was determined that insufficient quantities of samples were collected for the required laboratory analyses. These borings were redrilled at approximately the same locations. A three-inch-diameter split-barrel sampler was used for the "extra" samples. These additional borings were designated as "A," "B," and "C."

Following the discovery of an area of elevated contaminant concentration, five additional borings were drilled. Also, deep samples were obtained from a sixth location already designated as near-surface sample location E-11-F. These borings were drilled from February 4 to 6, 1985 and were designated as B-105 through B-110. Drilling was performed by the same methods used for the four original borings.

Near-surface soil samples were obtained from 28 hand auger borings on the site. A total of 34 samples were collected from 14 of the 28 hand auger boring locations for analysis of full priority pollutants or dioxin only. The near-surface samples from the remaining 14 locations were sealed and archived for future analysis as needed. The locations of all drilled borings and near-surface samples are shown in Figure 4.2.4-1. Locations of the sampling points relative to the site coordinate system and ground surface elevations relative to the site data are provided in Table 4.2.4-1. Descriptions of sampling techniques are provided in the following subsections.

4.2.4.1 Drilled Borings

4.2.4.1.1 Drilling Procedures

Twenty-three (five deep and 18 shallow) borings were drilled at the locations shown in Figure 4.2.4-1. At each location, the boring was advanced through the surficial fill material with a 12-inch O.D., 6-inch I.D. hollow-stem

auger. Continuous samples of fill material were collected ahead of the auger by two- and three-inch O.D. split-spoon samplers driven in two-foot increments using a 140-pound hammer with a 30-inch vertical drop.

The drilling progressed with the taking of samples and subsequent advancement of the auger to the bottom of the previous sampling interval until the bottom of the fill was reached. If a boring was to be advanced below the fill to the underlying silt and/or alluvial sands, an eight-inch polyvinyl chloride (PVC) casing was set to the contact elevation between the fill and underlying stratum. This casing was tremie grouted to the surface with a cement grout. The grout was mixed in the following proportions: one 94-pound bag of Type I portland cement; 5.2 gallons of fresh water; and approximately one ounce of aluminum hydroxide. The grouted casing was allowed to set overnight to attain partial strength before drilling operations continued. After the grout set, it was drilled out using an eight-inch roller bit and recycled drill water. Sampling in the underlying silt layer was then initiated for the five deep borings installed in fall 1984. Borings cemented in 1985 substituted bentonite for the aluminum hydroxide per NJDEP's site geologist.

The silt layer was sampled by continuous, undisturbed Shelby tube samples. Each Shelby tube was hydraulically pushed into the silt a maximum distance of two feet, allowed to stabilize in the borehole for 15 minutes, and then removed. After removal of the Shelby tube, the boring was advanced to the bottom depth of the previous Shelby tube sample with a four-inch roller bit and recirculating wash water. This drilling procedure was continued until the bottom of the silt layer was encountered. If sampling was to be performed below the silt layer, a four-inch PVC casing was installed to the depth of the silt/alluvial sand contact and tremie grouted to the ground surface. The casing was left undisturbed for at least 24 hours to allow curing of the grout mixture.

Sampling in the alluvial sands consisted of obtaining standard split-spoon samples at five-foot intervals and advancing the boring using rotary methods with water or drilling mud and a nominal four-inch roller bit (actual size was 3.75 inches). If field conditions warranted, a temporary steel casing was set in the boring to prevent caving of the borehole during drilling operations.

At the completion of a boring to its specified depth, the boring was tremie grouted to the surface using cement grout as the temporary steel casing was removed. All water forced to the surface during the grouting procedure was collected and stored on site.

4.2.4.1.2 Sample Collection Procedures

At each boring location, the first sample was taken from zero to six inches using a hand trowel. The sample was placed in an aluminum pan and thoroughly mixed in accordance with NJDEP protocol before placement into sample bottles. All subsequent samples were taken with a split-spoon sampler or Shelby tube, depending on the type of material encountered. Sampling intervals were as follows:

- Ground surface to 6 inches
- 6 inches to 12 inches
- 12 inches to 24 inches
- 18-inch intervals to the bottom of the boring.

Three different sampling interval strategies were utilized for Borings B-105 through B-110. If a near-surface sample had previously been obtained at the boring location (B-105 and B-107), the sampling interval was as follows:

- 2.0 feet to 3.0 feet
- 1.0-foot intervals to the bottom of the boring.

At boring locations where no previous sampling had occurred (B-106, B-109, and B-110), the sampling intervals were:

- Ground surface to 6 inches
- 6 inches to 12 inches
- 12 inches to 24 inches
- 12-inch intervals to the bottom of the boring.

At the near-surface boring location (B-108), the sampling interval was ground surface to 2.0 feet. This sample was then trimmed on all sides and cut to the following intervals:

- Ground surface to 0.5 feet
- 0.5 feet to 1.0 feet
- 1.0 feet to 2.0 feet.

After removal from the borehole, the split-spoon sampler was opened and placed on clean paper on a portable workbench. A photograph was taken of the sample with appropriate identification indicated to provide a permanent record of sample condition at the time of collection. The samples from borings designated as "A," "B," and "C" were not photographed prior to being placed in containers. A physical description of each sample was recorded in the field log notebook and on the field boring log by the site geologist. The various soil strata in each boring were described using both the Burmister and the Unified Soil Classification System (USCS).

After removal from the borehole, Shelby tubes were examined and data such as length of sample recovered and type of material were recorded. Each end of the Shelby tube was sealed with melted wax and covered with a plastic end piece. The end piece was taped and then sealed with more melted wax to provide an airtight seal. Each Shelby tube was marked with a sample label and permanent marker before being transported to the decontamination line under Chain-of-Custody procedures.

After each sample was obtained, all equipment used in the sampling process, including split-spoon samplers, trowels, and pans was sent to the decontamination line for cleaning prior to reuse. Shelby tubes were decontaminated and wrapped in plastic before being used for sampling. All augers and drill bits were decontaminated after the completion of sampling at a particular boring location before proceeding to the next boring location.

Each of the two samples obtained from the top 12 inches of the 5 deep borings drilled in the fall 1984 campaign were analyzed for dioxin.

All 31 samples obtained from the initial 4 shallow borings (including those that were redrilled) in the January and February 1985 campaign were analyzed for all priority pollutant parameters; the additional samples collected after discovery of the "hot spots" on site were analyzed for dioxin only.

4.2.4.2 Near-Surface Soil Sampling

Near-surface soil sampling locations were chosen at the nodes of a 50-foot by 50-foot grid. The 28 sample locations are shown in Figure 4.2.4-1. Samples

were obtained by hand augering from depths of 0 to 6 inches, 6 to 12 inches, and 12 to 24 inches at each location. Each near-surface soil sampling location was identified by its grid coordinate system location, as previously described.

Thirty samples were collected from hand auger borings exterior to the site buildings and four samples were collected inside the areas which were previously occupied by buildings. (Note that depths for the samples under buildings were measured from the bottom of concrete floor slabs.) Thus, a total of 34 soil samples were collected for analysis from the 14 selected hand auger boring locations from depths of 0 to 24 inches (0 to 6 inches, 6 to 12 inches, and 12 to 24 inches). All of these samples were analyzed for dioxin; 11 were also analyzed for all priority pollutant parameters. Samples collected from the remaining 14 near-surface locations were archived for possible analysis at a later time.

Borings B-105 and B-108 were also designated as near-surface soil locations. Station E-11-F corresponds to Boring B-105 and Station E-9-D corresponds to Boring B-108.

In exterior areas, access was gained by either removing the geofabric cover from the sample point or by cutting an approximate two-foot-square hole in the geofabric cover. In the interiors of buildings and any outside area covered by asphalt or concrete pavement, penetration was made using a portable coring machine. An eight-inch-diameter, thin-walled diamond core bit was used to drill through the concrete or asphalt.

Material collected from the entire sampling interval was placed in an aluminum mixing pan and thoroughly composited before being placed into sample bottles. Samples were placed in either 250- or 500-milliliter amber sampling bottles depending on the analysis to be performed.

After completion of sampling from the upper 12 inches in unconsolidated materials, the hole was cased with an eight-inch PVC pipe. The eight-inch casing was grouted in the hole with a quick-drying hydraulic cement to anchor it and prevent cross contamination of the lower sampling increment from materials sloughing down the outside.

Samples collected from 12 to 24 inches were obtained with a post-hole digger, hand auger, hand trowel, or by hand. At some locations where brick or concrete debris was encountered, a steel digging bar was used to break up or loosen the material to be sampled. Material collected from the entire sample length was placed in an aluminum mixing pan and composited. Upon completion of sampling to 24 inches, a four-inch PVC casing was installed with either cement grout or quick-drying hydraulic cement.

If refusal occurred during the course of advancing the hole, an attempt was made to break through the obstruction with a steel digging bar. After completion of the sampling process, all holes were immediately grouted to the surface with cement grout.

4.2.4.3 Excavated and Backfilled Areas

The areas with the highest presence of dioxin and/or other contaminants were selected and are shown in Figure 4.2.4.3-1 as shaded areas. These "hot spot" areas, designated as 1 through 6, were excavated to remove the dioxin contaminated soil.and backfilled in the period from March 9 to April 2, 1985. Area No. 1 was excavated to the depth of 6 to 9 inches and backfilled with clean material. Areas Nos. 2 through 5 were excavated to the depth of 12 to 15 inches with an additional 6 inches excavated in Area No. 2. Prior to backfilling, a six-mil PVC liner was placed on the bottom of excavation.

4.2.5 Ground Water

Three shallow monitoring wells were installed on site to evaluate the hydrogeologic regime and nature of contaminants present in the ground water. All shallow wells (designated as "A") were completed in the surface fill above the organic silt layer after completion of an adjacent soil investigation boring. Locations of the three on-site monitoring wells are shown in Figure 4.2.5-1.

4.2.5.1 Shallow Monitoring Well Installation

Three shallow monitoring wells were installed at locations adjacent to three borings on the 120 Lister Avenue site during the time period of January 15 through 18, 1985. These wells have been designated MW-101A through MW-103A. The boreholes were advanced with 12-inch-diameter hollow-stem augers to the bottom of the fill/top of the silt interface as determined from the borings

drilled for the near-surface soil samples. No soil samples were obtained from these borings because of their proximity to earlier soil sample borings. All drilling tools were decontaminated between well borings. A schematic diagram of a typical shallow monitoring well is shown in Figure 4.2.5.1-1.

Two-inch-diameter, flush-coupled and threaded, Schedule 40 PVC well screen and riser pipe were utilized for the wells. A nonsolvent welded plug was placed in the bottom of each screen and a PVC vented cap at the top of each well. Prebagged sand was utilized as the filter pack. Approximately 0.2 foot of compressed bentonite pellets was placed on top of the filter pack. The remaining portion of the hole was backfilled with a cement/bentonite grout. A 4.0-foot protective steel casing was installed at each well and a 1.5-foot by 1.5-foot concrete collar around the protective casing at the ground surface. A vent hole was drilled in each protective casing. A lock was installed on all protective casing lids.

All PVC materials were decontaminated prior to use on site.

4.2.5.2 Well Development

Following installation of the well, development was performed on January 23 and 24, 1985 to remove materials introduced into the screened soil strata during drilling; using bailing and surging techniques. All wells were developed for a minimum period of one hour or until a turbidity-free discharge was obtained. Surging was employed for wells installed in the upper fine-grained fill materials. Well development was performed at least two days after well completion to minimize the potential for drawing uncured grout into the filter pack of the well. All water resulting from well development was collected and stored on site.

4.2.5.3 Water Level Monitoring

The ground water levels in the three monitoring wells on the 120 Lister Avenue site were recorded on February 13, 1985, during the well evacuation prior to water sampling. The ground water elevations were as follows:

- MW-101A - El 96.90 (9:06 a.m.)
- MW-102A - El 96.33 (9:15 a.m.)
- MW-103A - El 92.94 (9:11 a.m.).

These elevations were derived from the measured distance from the top of the well riser pipe to the water level as recorded by a water level indicator. The probe of the indicator was rinsed with hexane between wells to reduce the potential for cross contamination of the wells.

4.2.5.4 Ground Water Sampling

Following installation and development, the three shallow monitoring wells were sampled on February 13, 1985 and March 6, 1985 to complete the required two rounds of sampling. Monitoring Well 103A was damaged between the first and second round of sampling. No sample was obtained from this well on March 6, 1985. The wells were evacuated with laboratory-cleaned dedicated bailers prior to sampling with a total of three to five casing volumes of water removed or until the well was dry. The minimum required bails to be evacuated from each well were determined as follows:

- The height of the water column in each well was determined with a water level indicator and the known depth of the well from the well installation log
- The height of the water column in inches was multiplied by 5
- The resultant value was divided by 30, the height of the bailer in inches, which yielded the number of bails to be evacuated.

Readings were taken from the staff gage on the Passaic River at the 80 Lister Avenue site several times prior to, during, and following the sampling to verify the tidal effect upon the river (i.e., a falling or rising tide) (see Site Evaluation, 80 Lister Avenue).

The well sampling was completed within three hours of evacuation after sufficient recharge of the well had occurred. The following sample bottles, provided by IT, were filled and transferred under Chain-of-Custody protocol:

- Two 40-ml VOA vials
- Five 1-liter bottles
- One 1-gallon jug.

In addition, a 500-ml bottle was filled to be used for field analyses. These field tests include pH, specific conductance, temperature, salinity, and dissolved oxygen content, and were performed immediately after the sampling of each well. The results of the field analysis are presented in Table 4.2.5.4-1. At the completion of the sampling procedures, a laboratory-cleaned bailer was filled with organic-free water. This water was then used to fill six 40-ml vials that were used as field blanks for a check on the bailer decontamination technique. The bailers used in the sampling were then returned to the decontamination area for decontamination and subsequent return to the Knoxville laboratory.

4.2.5.5 Aquifer Evaluation

Slug testing and aquifer evaluation was performed on the 120 Lister Avenue monitoring wells on March 11 and 12, 1985 to evaluate the transmissivity of the water-bearing strata. Due to the slow recharge rate of the wells during the development and sampling programs, the wells were bailed to induce a drawdown and the recovery monitored over time with an in situ 1000A data recorder. A pressure transducer was used to measure responses in the aquifer.

The field information is currently being processed and is not included in this report. This information will be reported in the July 3 report.

4.2.6 Drums

Nineteen 55-gallon drums were located in a box trailer in the northeast corner of the 120 Lister Avenue site. Opening and sampling of the drums were performed according to the methods described in the 80 Lister Avenue Work Plan, including 4-man sampling crews, 2 of whom wore self-contained breathing apparatus. Each drum was labeled with a letter of the alphabet for identification purposes prior to sample collection. Prior to and during drum opening activities, monitoring was conducted using a HNU/PID organic vapor detector and a Gastex 3 (GX-3) combustible gas indicator. Drums were resealed after the sample was collected.

One of the drums contained too little material to provide sufficient sample for analysis. The 18 samples collected were scheduled for immediate analysis

of Hazardous Characterization/Compatibility, EP Toxicity, and PCB Screening; dioxin analysis was given a "hold" status.

Upon completion of sample collection, all of the drums were moved to the 120 Lister warehouse pad area, now considered part of the 80 Lister Avenue site, for temporary storage.

TABLES

TABLE 4.1.2-1

ANALYSES REQUIRED AND LABORATORY DESTINATIONS
FOR 120 LISTER AVENUE SAMPLES

SAMPLE TYPE	ANALYSES REQUIRED	IT ANALYTICAL LABORATORY
Soil (near-surface and borings)	• 2,3,7,8-TCDD • BNA, Metals, Cyanide, Phenols • VOA • Pesticides, Herbicides	• Director's Drive • Director's Drive/Middlebrook • Cerritos • Santa Clara
Soil (near-surface and borings)	• 2,3,7,8-TCDD only	• Director's Drive (or: archive on site)
Wipes, Chips	• 2,3,7,8-TCDD only	• Director's Drive
Drums	• EP Tox, PCB Screen, HazCat, hold for 2,3,7,8-TCDD	• Pittsburgh
Ambient Air/IH	• 2,3,7,8-TCDD	• Directors's Drive
Well Water	• 2,3,7,8-TCDD • BNA • VOA, Metals, Cyanide, Phenols • Pesticides, Herbicides	• Director's Drive • Cerritos • Middlebrook • Cerritos/Santa Clara

TABLE 4.1.3.2-1

SAMPLE PACKAGING REQUIREMENTS

HAZARDOUS (POISON B PACKAGING)	NONHAZARDOUS (CONVENTIONAL PACKAGING, PRESERVATION IN ICE CHESTS)
Site Soils (near-surface and borings)	Ground Water
Wipes	Industrial Hygiene
Drums	Ambient Air
Tanks	
Chips	

TABLE 4.1.3.2-2

SAMPLE PRESERVATION REQUIREMENTS

PARAMETER	TECHNIQUE	
	SOIL	WATER
2,3,7,8-TCDD	None	None
Organic PP	Cool, 4°C[a]	Cool, 4°C[a]
Metals	None	2 ml conc. HNO_3[b] (to pH <2)
Cyanide	None	2 ml conc. NaOH[b] (to pH >12)
Phenols	None	2 ml conc. H_2SO_4[b] (to pH <2)

[a] When possible, with packaging restrictions.

[b] Added to sample bottles prior to collection; these containers must not be rinsed prior to being filled with sample.

TABLE 4.1.3.4-1

ROUTINE QUALITY CONTROL SAMPLES AND
LABORATORY CHECK FREQUENCIES

	FIELD BLANKS	TRIP BLANKS	ON-SITE SPLITS WITH NJDEP	METHOD BLANKS	BLIND SPLITS	SAMPLE OR BLANK SPIKES	INTERNAL SURROGATE STANDARDS	REFERENCE (CALIBRATION STANDARDS)
2,3,7,8-TCDD								
Wipes	5	5	-	5	-	5	100	1/shift
Soil	-	-	5	5	5	5	100	1/shift
Water	5	5	5	5	5	5	100	1/shift
Chips	-	-	5	5	5	5	100	1/shift
VOLATILES								
Soil	5	5	5	5	5	5	100	1/shift
Water	5	5	5	5	5	5	100	1/shift
SEMI-VOLATILES								
Soil	-	-	5	5	5	5	100	1/shift
Water	5	5	5	5	5	5	100	1/shift
PP METALS								
Soil	-	-	5	5	5	5	-	1/shift
Water	5	5	5	5	5	5	-	1/shift
CYANIDE								
Soil	-	-	5	5	5	5	-	1/shift
Water	5	5	5	5	5	5	-	1/shift
TOTAL PHENOLS								
Soil	-	-	5	5	5	5	-	1/shift
Water	5	5	5	5	5	5	-	1/shift

Note: All numbers are percentages

TABLE 4.1.4-1

ANALYSIS PARAMETERS VERSUS SAMPLE MATRICES

ANALYTICAL PARAMETERS	NUMBER OF PARAMETERS OR ANALYTES/ ANALYTICAL METHOD	SAMPLE TYPES							
		SOIL	WELL BORINGS (SOIL)	AIR	WELL WATER	DRUMS	WIPES	CHIPS	INDUS-TRIAL HYGIENE
2,3,7,8-TCDD	(1)	X	X	X	X	X	X	X	X
Priority Pollutant Acid Base/Neutrals (Ac/B/N)	(69)	X	X		X				
Priority Pollutant Pesticides	(25)	X	X		X				
Priority Pollutant Metals	(13)	X	X		X				
Priority Pollutants Volatile Organic Compounds (VOC)	(38)	X	X		X				
Herbicides	(10)	X	X		X				
Cyanides	(1)	X	X		X				
Phenols	(1)	X	X		X				
Hazardous Waste Characterization	-					X			
EP Toxicity	-					X			
PCB Screen	-					X			

TABLE 4.1.4-2

LISTING OF ANALYTES

CAS NUMBER	COMPOUND NAME
DIOXIN	
1746-01-6	2,3,7,8-Tetrachloro-dibenzo-p-dioxin
PRIORITY POLLUTANTS	
Volatile Organic Compounds	
71-43-2	Benzene
56-23-5	Carbon tetrachloride
108-90-7	Chlorobenzene
107-06-2	1,2-Dichloroethane
71-55-6	1,1,1-Trichloroethane
75-34-3	1,1-Dichloroethane
79-00-5	1,1,2-Trichloroethane
79-34-5	1,1,2,2-Tetrachloroethane
75-00-3	Chloroethane
542-88-1	Bis(chloromethyl) ether
110-75-8	2-Chloroethylvinyl ether
67-66-3	Chloroform
75-35-4	1,1-Dichloroethene
156-60-5	trans-1,2-Dichloroethene
78-87-5	1,2-Dichloropropane
10061-02-6	trans-1,3-Dichloro-propene
10061-01-5	cis-1,3-Dichloro-propene
100-41-4	Ethylbenzene
75-09-2	Methylene chloride
74-87-3	Chloromethane
74-83-9	Bromomethane
75-25-2	Bromoform
75-27-4	Bromodichloromethane
75-69-4	Trichlorofluoromethane
75-71-8	Dichlorodifluoromethane
124-48-1	Chlorodibromomethane
127-18-4	Tetrachloroethene
108-88-3	Toluene
79-01-6	Trichloroethene
75-01-4	Vinyl chloride
67-64-1	Acetone
78-93-3	2-Butanone
75-15-0	Carbon disulfide
519-78-6	2-Hexanone

TABLE 4.1.4-2
(Continued)

CAS NUMBER	COMPOUND NAME
108-10-1	4-Methyl-2-pentanone
100-42-5	Styrene
108-05-4	Vinyl acetate
95-47-6	Total Xylenes

PRIORITY POLLUTANTS

Base/Neutral and Acid Extractable Organic Compounds

88-06-2	2,4,6-Trichlorophenol
59-50-7	4-Chloro-3-methyl-phenol
95-57-8	2-Chlorophenol
120-33-2	2,4-Dichlorophenol
105-67-9	2,4-Dimethylphenol
88-75-5	2-Nitrophenol
100-02-7	4-Nitrophenol
51-28-5	2,4-Dinitrophenol
534-52-1	4,6-Dinitro-2-methylphenol
87-86-5	Pentachlorophenol
108-95-2	Phenol
65-85-0	Benzoic acid
95-48-7	2-Methylphenol
108-39-4	4-Methylphenol
95-95-4	2,4,5-Trichlorophenol
83-32-9	Acenaphthene
92-87-5	Benzidine
120-82-1	1,2,4-Trichlorobenzene
118-74-1	Hexachlorobenzene
67-72-1	Hexachlorethane
111-44-4	Bix(2-chloroethyl)ether
91-58-7	2-Chloronaphthalene
95-50-1	1,2-Dichlorobenzene
541-73-1	1,3-Dichlorobenzene
106-46-7	1,4-Dichlorobenzene
91-94-1	3,3'-Dichlorobenzidine
121-14-2	2,4-Dinitrotoluene
606-20-2	2,6-Dinitrotoluene
122-66-7	1,2-Diphenylhydrazine
206-44-0	Fluoranthene
7005-72-3	4-Chlorophenyl phenyl ether
101-55-3	4-Bromophenyl phenly ether
39638-32-9	Bis(2-chloroisopropyl)ether
111-91-1	Bis(2-chloroethoxy)methane
87-68-3	Hexachlorobutadiene
77-47-4	Hexachlorocyclopentadiene
78-59-1	Isophorone
91-20-3	Naphthalene
98-95-3	Nitrobenzene
62-75-9	N-nitrosodimethylamine
86-30-6	N-nitrosidiphenylamine

TABLE 4.1.4-2
(Continued)

CAS NUMBER	COMPOUND NAME
621-64-7	N-nitrosodipropylamine
117-81-7	Bis(2-3thylhexyl)phthalate
85-68-7	Butyl benzyl phthalate
84-74-2	Di-N-butyl phthalate
117-84-0	Di-N-octyl phthalate
84-66-2	Diethyl phthalate
131-11-3	Dimethyl phthalate
56-55-3	Benzo(A)anthracene
50-32-8	Benzo(A)pyrene
205-99-2	Benzo(B)fluoranthene
207-08-9	Benzo(K)fluoranthene
218-01-9	Chrysene
208-96-8	Acenaphthylene
120-12-7	Anthracene
191-24-2	Benzo(GHI)perylene
86-73-7	Fluorene
85-01-0	Phenanthrene
53-70-3	Dibenzo(A,H) anthracene
193-39-5	Indeno(1,2,3-CD)pyrene
129-00-0	Pyrene
62-53-3	Aniline
100-51-6	Benzyl alcohol
106-47-8	4-Chloroaniline
132-64-9	Dibenzofuran
91-57-6	2-Methylnaphthalene
88-74-4	2-Nitroaniline
99-09-2	3-Nitroaniline
100-01-6	4-Nitroaniline

PRIORITY POLLUTANTS

Pesticides and PCBs

309-00-2	Aldrin
60-57-1	Dieldrin
57-74-9	Chlordane
50-29-3	4,4'-DDT
72-55-9	4,4'-DDE
72-54-8	4,4'-DDD
959-98-8	alpha-Endosulfan
33213-65-9	beta-Endosulfan
1031-07-8	Endosulfan sulfate
72-20-8	Endrin
7421-93-4	Endrin aldehyde
76-44-8	Heptachlor
1024-57-3	Heptachlor epoxide
319-84-6	alpha-BHC
319-85-7	beta-BHC
58-89-9	gamma-BHC
319-86-8	delta-BHC

TABLE 4.1.4-2
(Continued)

CAS NUMBER	COMPOUND NAME
53469-21-9	PCB-1242
11097-69-1	PCB-1254
11104-28-2	PCB-1221
11141-16-5	PCB-1232
12672-29-6	PCB-1248
11096-82-5	PCB-1260
12674-11-2	PCB-1016
8001-35-2	Toxaphene

PRIORITY POLLUTANTS

Chlorinated Herbicides

75-99-0	Dalapon (Dowpon)
1918-00-9	Dicamba
7085-19-0	MCPP
94-74-6	MCPA
120-36-5	Dichloroprop (2,4-DP)
94-75-7	2,4-D
93-72-1	2,4,5-TP (Silvex)
93-76-5	2,4,5-T
94-82-6	2,4-DB
88-85-7	Dinoseb (DNBP)

PRIORITY POLLUTANTS

Metals

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

Classical Parameters

Total Cyanide
Total Phenols
Asbestos

TABLE 4.1.4-3

APPENDIX B COMPOUNDS ANALYZED AS PART OF THE PRIORITY POLLUTANT ANALYSIS

APPENDIX B COMPOUND	METHOD OF ANALYSIS
Monochlorobenzene	VOA Priority Pollutants
Hexachlorobenzene	Base Neutral Priority Pollutants
2,4,5-Trichlorophenol	Acid Priority Pollutants
2,4,6-Trichlorophenol	Acid Priority Pollutants
2,4-Dichlorophenol	Acid Priority Pollutants
Dichlorodiphenyl Trichloroethane (4,4'DDT)	Pesticide Priority Pollutant
2,4,5-Trichlorophenoxy Acetic Acid (2,4,5-T)	Herbicide Analysis(a)
2,4-Dichlorophenoxy Acetic Acid (2,4-D)	Herbicide Analysis(a)
Amine Salts of 2,4-D	Herbicide Analysis(a)
Amine Salts of 2,4,5-T	Herbicide Analysis(a)
Esters of 2,4-D	Herbicide Analysis(a)
Esters of 2,4,5-T	Herbicide Analysis(a)
Amine Salt of N-Oleyl-1,3-proplene diamine	Herbicide Analysis(a,b)

(a)Measured response by EPA Method 8150 all compounds are converted to the methylester for analysis by GC/EC representing total 2,4-D and 2,4,5-T concentration.

(b)Refers to an amine salt of 2,4-D and 2,4,5-T.

TABLE 4.2.4-1

COORDINATES AND ELEVATIONS OF
NEAR SURFACE SOIL SAMPLES, BORINGS, AND MONITORING WELLS

IDENTIFICATION	COORDINATES(a) NORTH	EAST	GROUND SURFACE ELEVATION(b)
NEAR SURFACE SOIL SAMPLES			
C-12-D(c)	110.0	593.0	97.5
C-11-D(c)	110.0	543.0	97.5
C-10-H	100.0	523.0	97.5
C-10-D(c)	110.0	493.0	97.5
C-9-D	110.0	443.0	97.7
C-8-D	110.0	393.0	97.8
D-9-D(c)	160.0	443.0	96.1
D-10-D	160.0	493.0	-
D-11-D(c)	160.0	543.0	97.3
D-8-I	190.0	425.0	97.5
E-10-F(c)	220.0	530.0	97.5
E-10-D	210.0	493.0	96.9
E-11-F	211.0	526.0	97.0
E-12-G	230.0	569.0	97.5
F-10-D(c)	260.0	493.0	96.3
F-11-D(c)	210.0	543.0	97.5
G-11-D	310.0	543.0	-
G-10-D	310.0	493.0	97.4
G-9-D(c)	310.0	443.0	97.5
H-12-D	360.0	593.0	97.5
H-11-D(c)	360.0	543.0	97.5
H-10-D(c)	360.0	493.0	97.5
H-9-D	360.0	443.0	97.6
J-12-D(c)	410.0	593.0	97.4
J-9-D(c)	410.0	443.0	97.5
J-10-D(c)	410.0	493.0	97.2
J-11-D	410.0	543.0	97.5
K-11-D(c)	460.0	543.0	97.6
K-10-D	460.0	493.0	97.2
NSSS#6	110.9	386.4	97.8
MONITORING WELLS			
MW-101A	264.0	426.0	97.1
MW-102A	160.0	593.0	97.6
MW-103A	487.0	581.0	97.4

See footnotes at end of table.

TABLE 4.2.4-1
(Continued)

IDENTIFICATION	COORDINATES(a) NORTH	EAST	GROUND SURFACE ELEVATION(b)
BORINGS			
B-101	(e)	(e)	97.1
B-101A	264.0	426.0	97.1
B-101B	(e)	(e)	97.1
B-101C	(e)	(e)	97.1
B-102	(e)	(e)	97.6
B-102A	160.0	593.0	97.6
B-102B	(e)	(e)	97.6
B-103	(e)	(e)	97.4
B-103A	487.0	591.0	97.4
B-104	460.0	443.0	97.5
B-104A	460.0	443.0	97.5
B-104B	(e)	(e)	97.5
B-105(d)	211.0	526.0	97.0
B-106	173.0	526.0	97.3
B-107	205.0	802.0	96.8
B-108	210.0	443.0	96.8
B-109	230.0	500.0	96.7
B-110	200.0	470.0	96.2
EXISTING BORINGS (FALL 1984)			
STB-1	201.1	502.6	96.8
STB-2	283.7	443.2	97.1
STB-3	350.0	494.7	97.5
STB-4	460.1	441.6	97.3
STB-5	441.5	553.8	97.6

(a)Coordinates are with respect to site grid (Figure 4.0-1).

(b)Ground surface elevations are with respect to site datum. To adjust elevations to New Jersey Geodetic Mean Sea Level Datum, subtract 90.94 feet from all ground surface elevations shown.

(c)Samples for archive purposes only.

(d)Boring B-105 was also designated as Near-Surface Soil Sample Location E-11-F.

(e)Borings located within 10 feet of the corresponding "A" location.

TABLE 4.2.5.4-1

FIELD WATER QUALITY DATA

DATE	WELL NUMBER	pH	TEMPERATURE °C	CONDUCTIVITY µmhos	SALINITY(a)	DISSOLVED OXYGEN mg/l
2/13/85	101A	8.4	3	110	1	12.6
2/13/85	102A	6.8	4	30	<1	13.2
2/13/85	103A	6.5	5	>500	5	11.0
3/6/85	101A	8.76	6.5	1250	1	1.7
3/6/85	102A	7.88	8.5	320	2	3.2

(a)Parts per thousand.

FIGURES

DRAWN BY	J.LOBRECO	4-19-85
CHECKED BY	MD	5-1-85
APPROVED BY	DHE	5-1-85
DRAWING NUMBER	846722-B1	

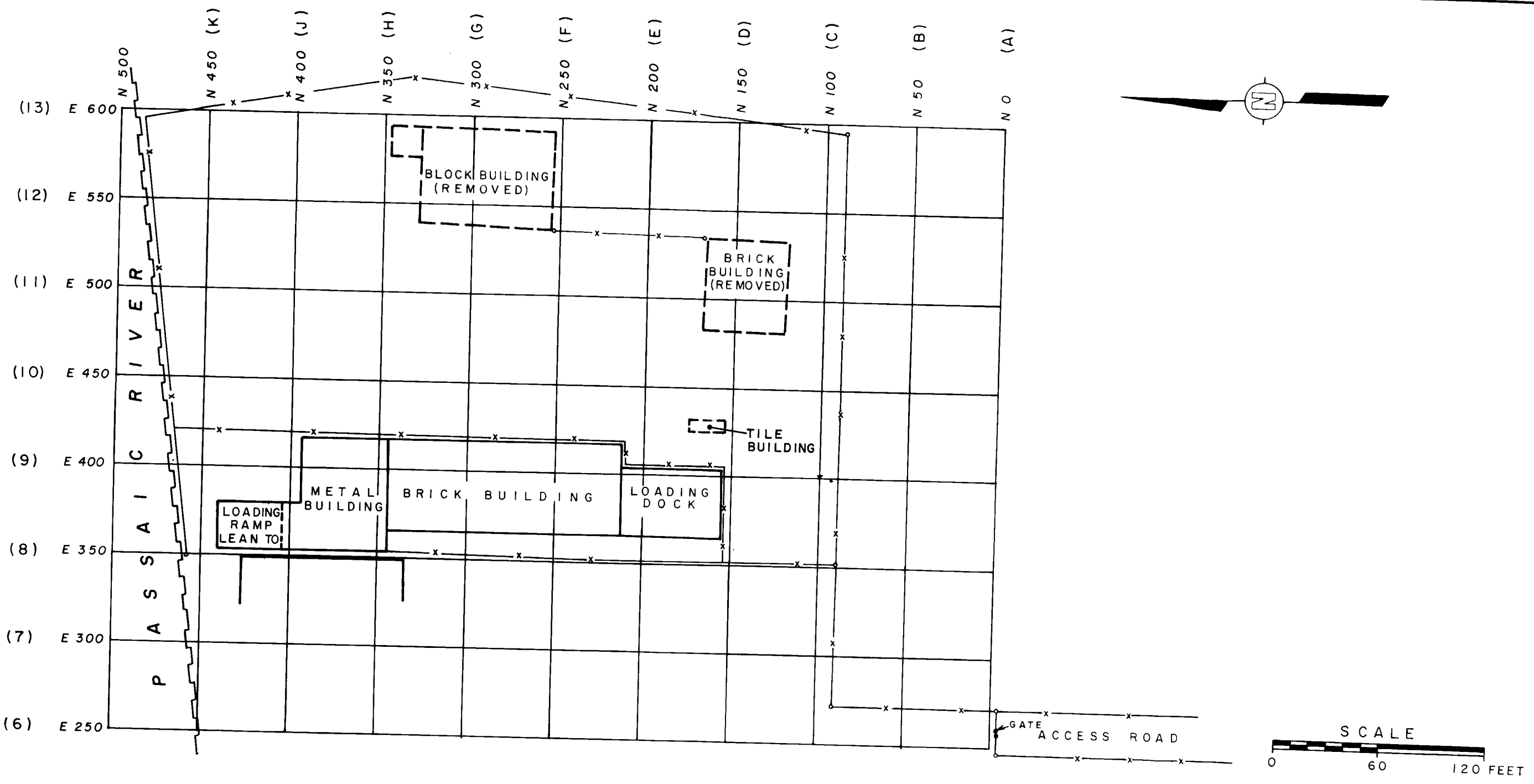

FIGURE 4.0-1

PLAN LOCATIONS OF BUILDING AND STRUCTURES

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DRAWN BY	CHECKED BY	DRAWING NUMBER
J. LORENCO 4-17-85	ND 5-1-85	846722-A20
	APPROVED BY DHE 5-1-85	

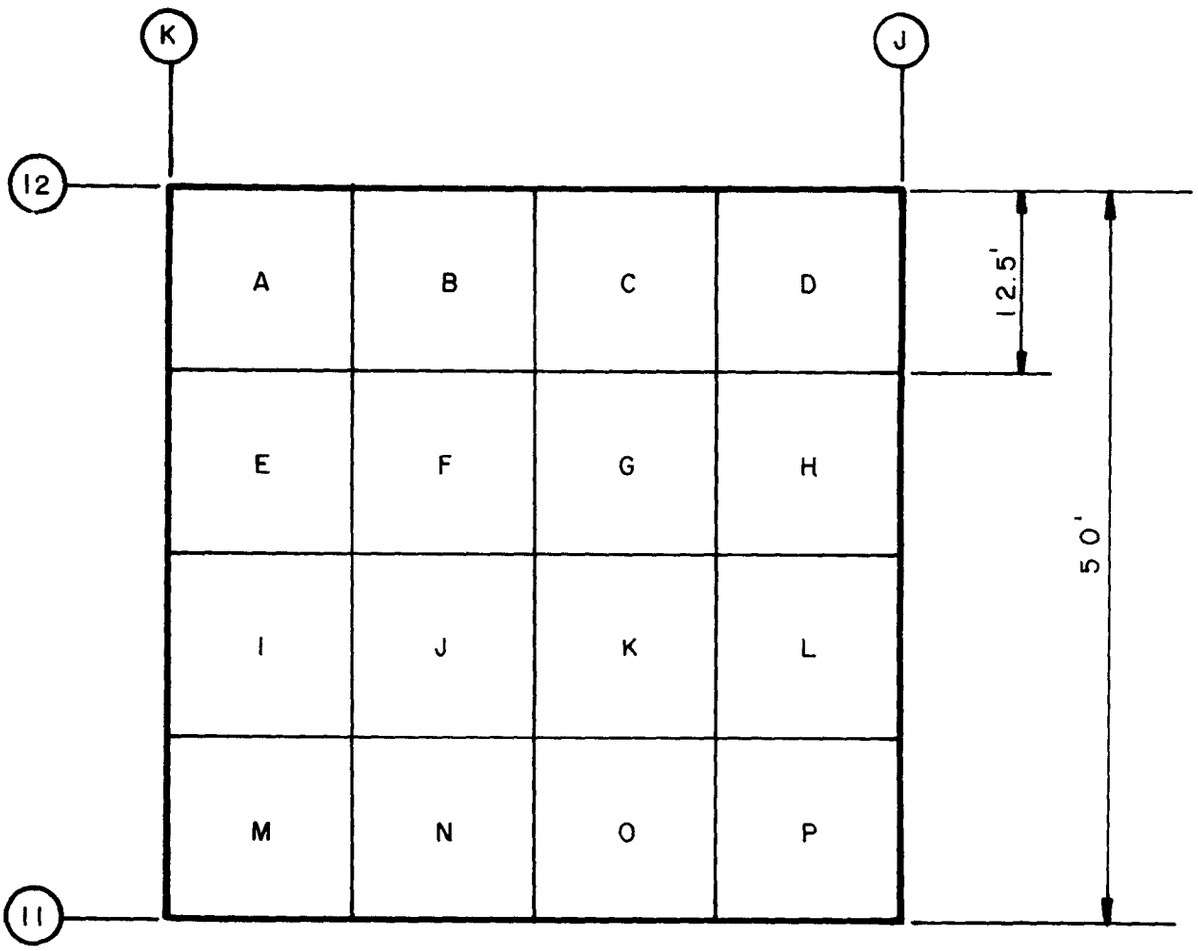

FIGURE 4.0-2

GRID SUBDIVISION
IDENTIFICATION

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DRAWN BY	CHECKED BY	DRAWING NUMBER
TRS 4-25-85	APPROVED BY ND 5-1-85 / DHE 5-1-85	846722-A26

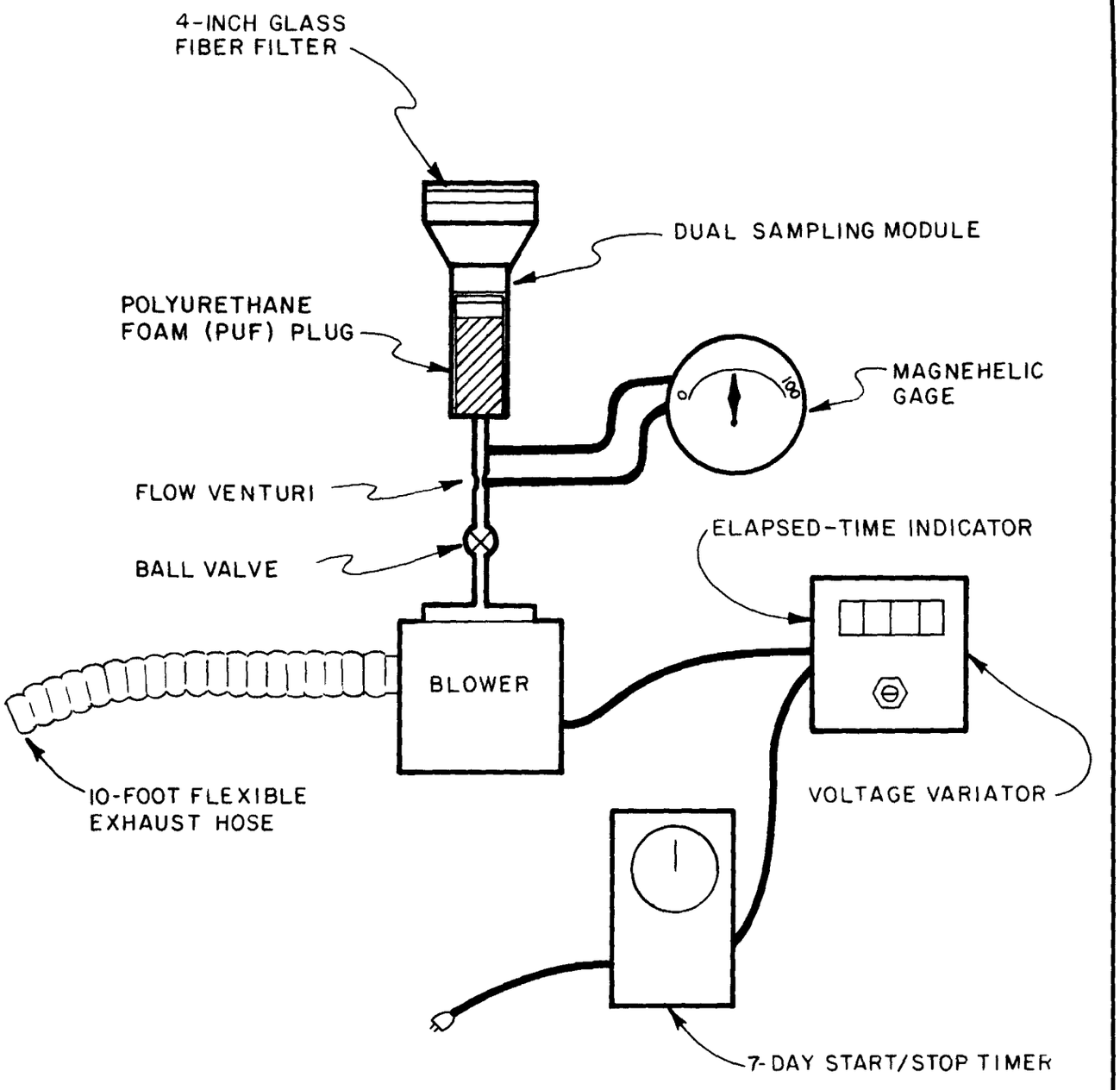

FIGURE 4.2.1-1

SCHEMATIC DIAGRAM OF THE PUF SAMPLER(2,3,7,8-TCDD, PESTICIDES AND OTHER CHLORINATED ORGANICS)

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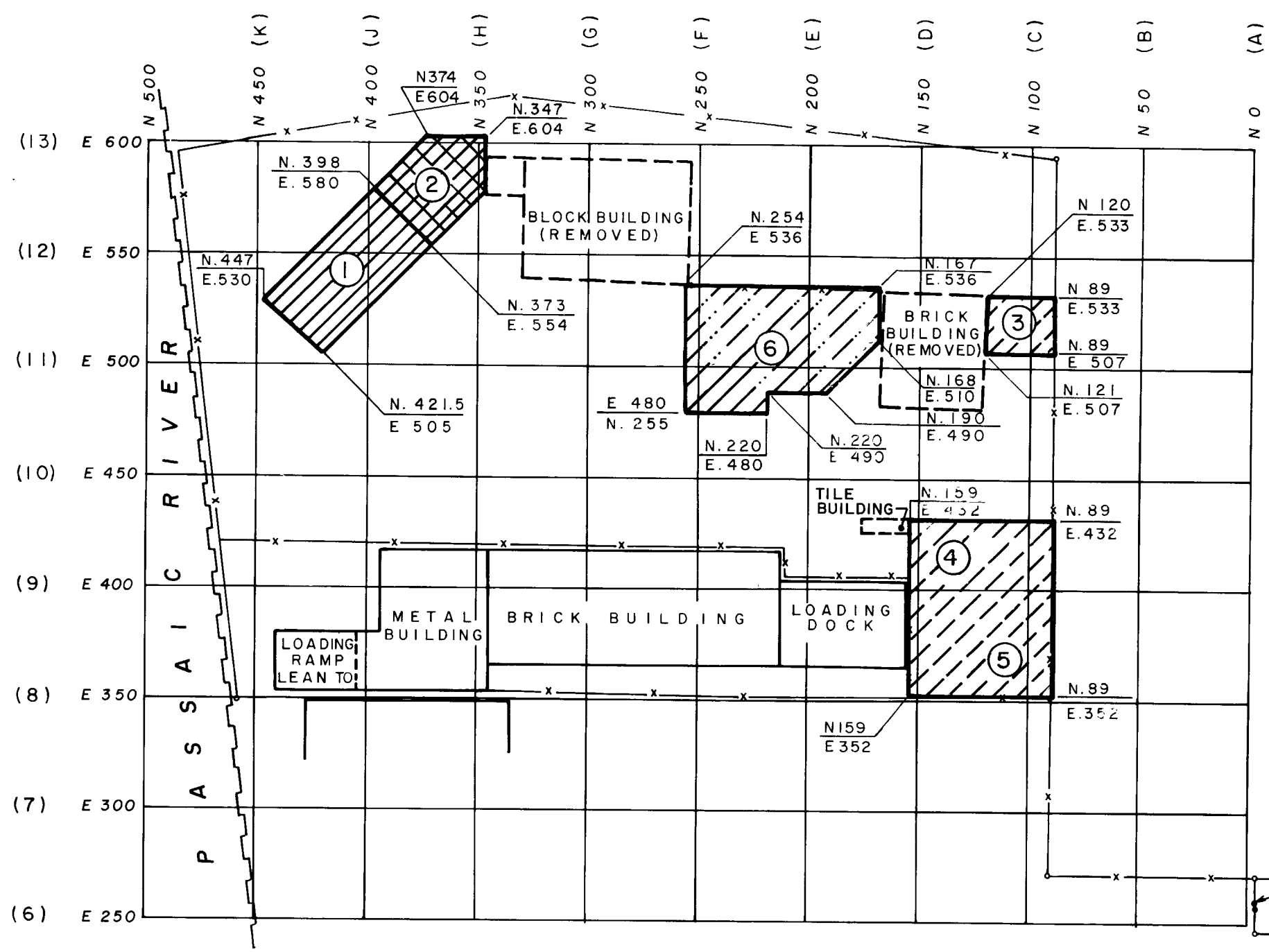
DRAWN BY	J LOGRECO 5-19-85
CHECKED BY	ND 5-1-85
APPROVED BY	DHE 5-1-85
DRAWING NUMBER	846722-B4
100% ORG.	3 3



LEGEND:

- 6"-9" DEPTH OF EXCAVATION
- 12"-15" DEPTH OF EXCAVATION
- 18"-21" DEPTH OF EXCAVATION
- 24" DEPTH OF EXCAVATION

SCALE
0 60 120 FEET

FIGURE 4.2.4.3-1

"HOT SPOT" SITE EXCAVATION AND BACKFILL AREAS

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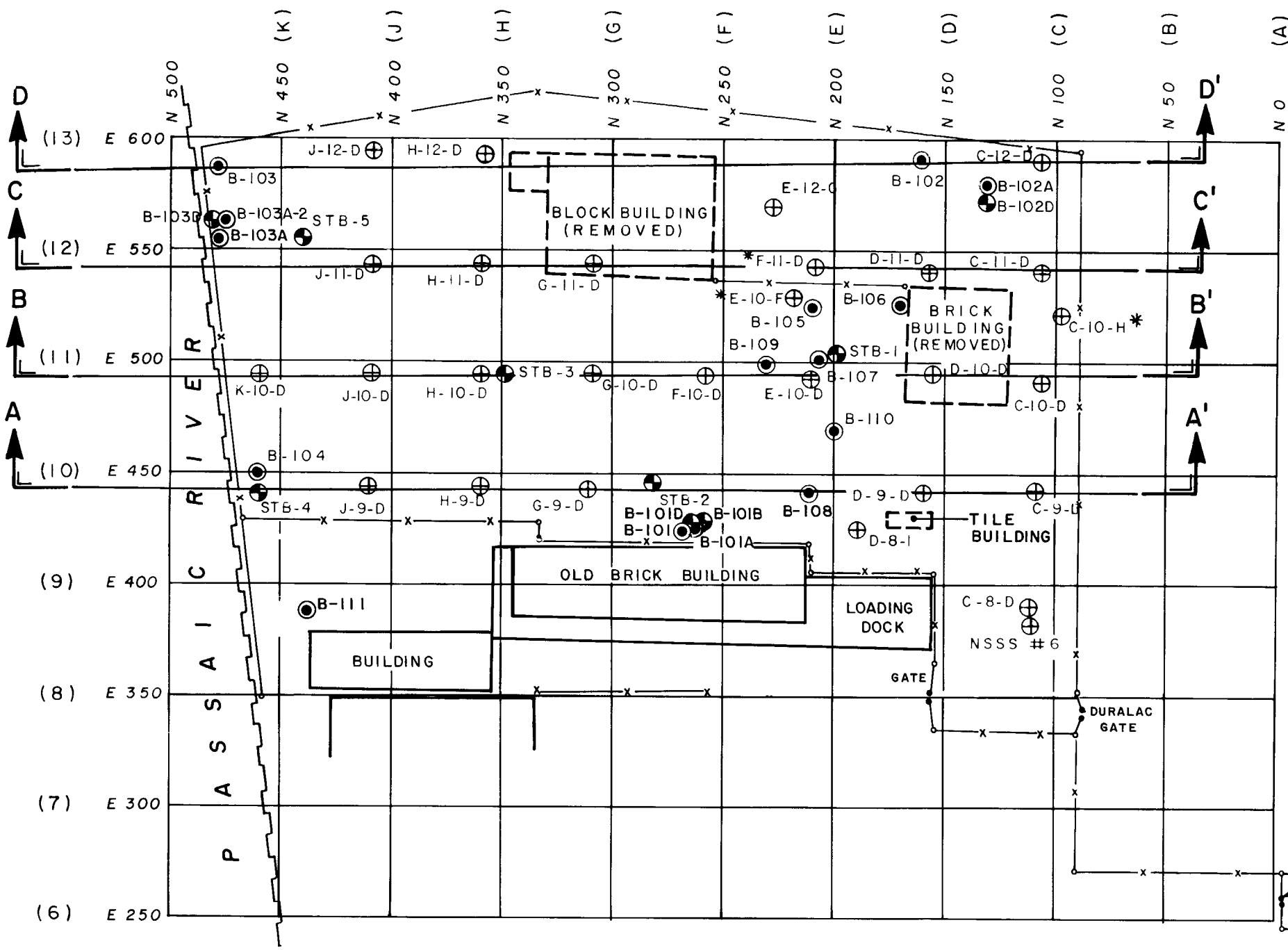
DEP\DA0086307

DRAWING NUMBER 846722-B2

CHECKED BY	ND 5-1-85
APPROVED BY	DHE 5-1-85
DRAWN BY	J.LOGRECO 4-19-85
LOG	-
ORG.	-



LEGEND:

- STB-3 — DEEP BORING LOCATION AND NUMBER
- B-104 — SHALLOW BORING AND NUMBER
- D-8-1 — NEAR SURFACE SOIL SAMPLE AND NUMBER

SCALE
0 60 120 FEET

NOTE:

* SAMPLES OR BORINGS WHICH HAVE BEEN RELOCATED ARE PLOTTED BY NORTH AND EAST COORDINATES ONLY. LETTER COORDINATES MAY NOT MATCH GRID.

FIGURE 4.2.4-1

NEAR SURFACE SOIL SAMPLE AND BORING LOCATION PLAN

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DEP\DA0086308

DRAWING NUMBER	846722-B3
CHECKED BY	MD 5-1-85
APPROVED BY	DHE 5-1-85
DRAWN BY	J. LOGRECO 4-19-85
100 ORG.	2
100 ORG.	2

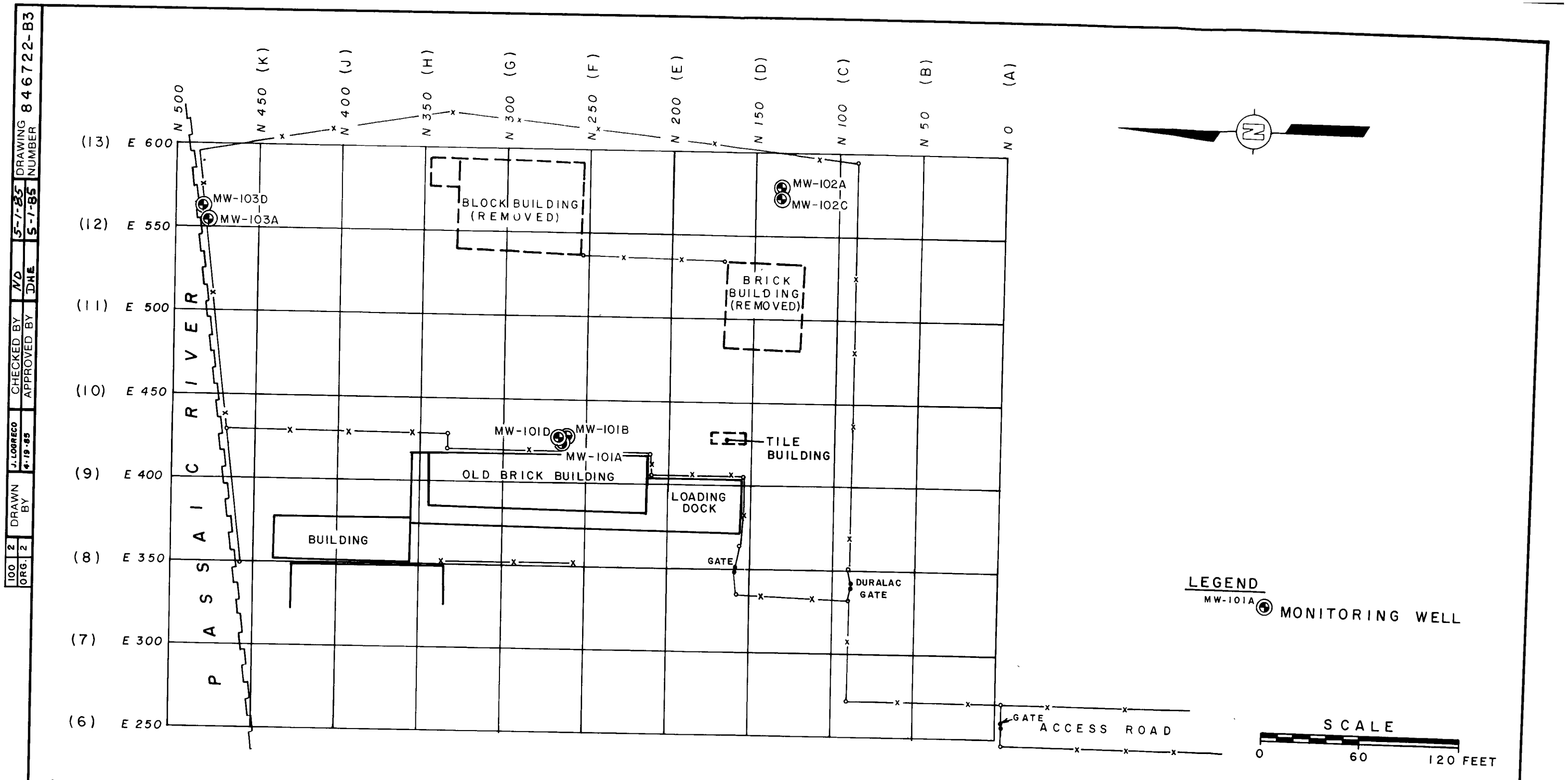

FIGURE 4.2.5-1

MONITORING WELL LOCATION PLAN

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DRAWN BY	CHECKED BY		DRAWING NUMBER
J. LOGNECO			846722-A21
4-17-85	APPROVED BY		
	NO	5-1-85	
	DHE	5-1-85	

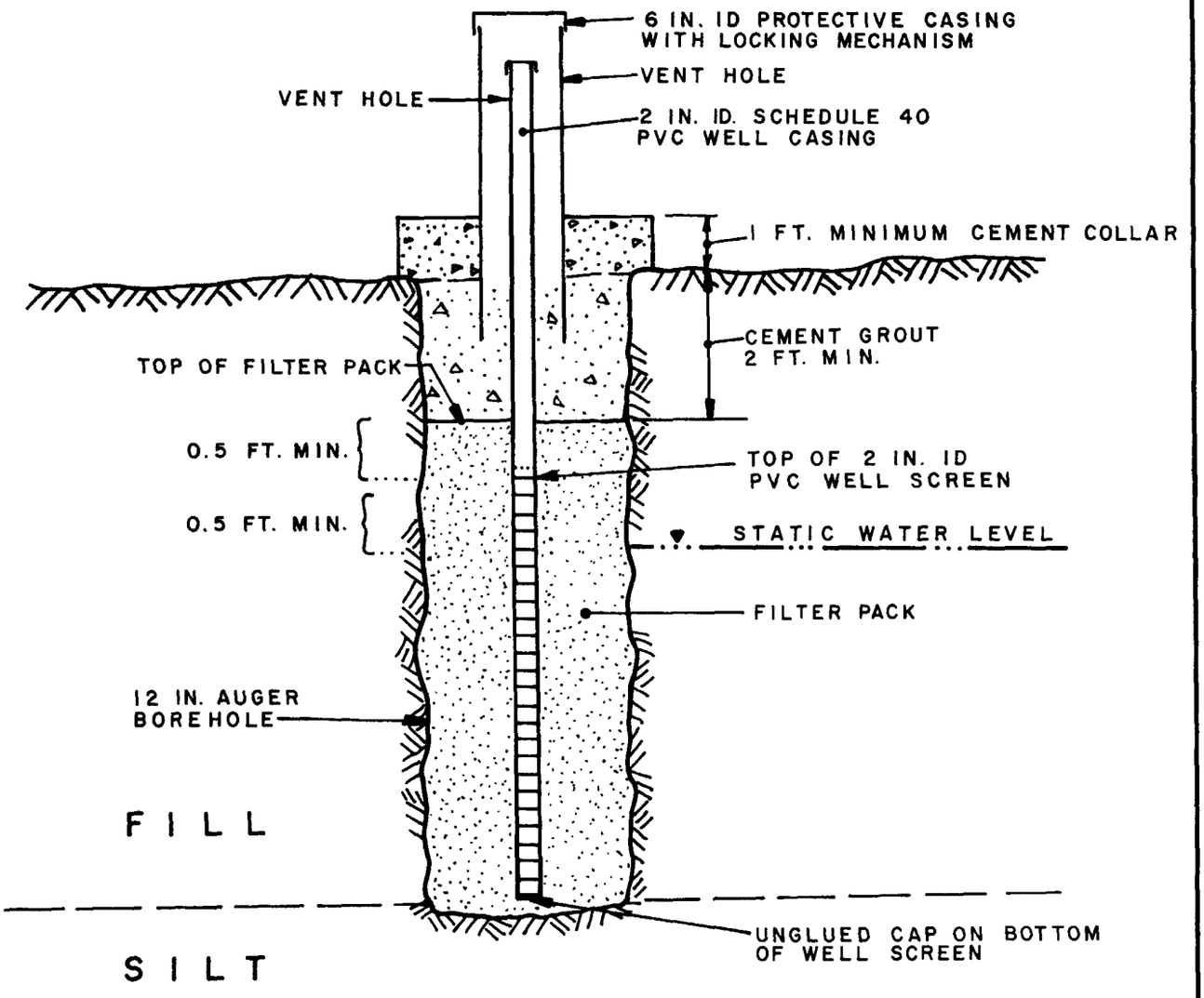

FIGURE 4.2.5.1-1

TYPICAL SHALLOW
MONITORING WELL IN FILL

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5.0

5.0 DATA PRESENTATION

The results of the field investigation program and subsequent laboratory analytical testing are presented in the following subsections. The results include logs of borings and near-surface sample holes, hydraulic conductivities and ground water flow rates, and concentrations of priority pollutants and dioxin detected in buildings, soils, and ground water.

Of the 373 samples collected through April 2, 1985, 77 soils and wipes were archived for possible future dioxin analyses. A total of 176 dioxin analyses (a complete tabulation of the dioxin results is presented in Appendix B) and 65 priority pollutant analyses were performed. The results of these analyses are summarized in tables and illustrated with figures presented herein. Complete laboratory analysis summaries and other supporting data are presented in appendices at the end of this report. Files of raw data as reported from the laboratories will be provided separately to NJDEP.

5.1 AMBIENT AIR

Ambient air samples were collected for dioxin analysis according to the method described in Section 4.2.1 of this report. Samples were collected on PUF samplers and were prepared and analyzed by the methods found in the 80 Lister Avenue Work Plan. During the period from January 15 to April 8, 1985, 86 ambient air samples were collected on the 120 Lister Avenue Site. Of the 86 samples collected, 18 samples (21 percent) were analyzed for dioxin. The remaining samples are archived in Knoxville.

Five samples (A006-2020-A-L, A006-2021-A-L, A006-2022-A-L, A006-2023-A-L, A006-2036-A-L) and one travel blank (T004-2056-A-L) are not reported due to low recoveries of the internal and surrogate standards: low peak areas (below the reliable quantitation limits) render the results highly unreliable. Low levels of dioxin were tentatively identified in some of these samples but are considered potentially as artifacts. Due to the original analysis using the total sample, no reanalysis was possible. Samples from the following day and all other ambient air travel blanks analyzed showed no detectable levels of dioxin.

Table 5.1-1 contains the dioxin results for the 13 reportable analyses of the PUF samples. Of the 13 samples, 12 had nondetected dioxin concentrations with an average detection limit of 9.4 picograms/cubic meter (pg/m^3). Sample A006-2756-A-L has an identified dioxin concentration of 33.5 pg/m^3, but due to matrix interference(s) does not meet all of the identification criteria for 2,3,7,8-TCDD as established in EPA methodologies, and the identification must, therefore, be considered tentative.

Three ambient air travel blanks (A006-2494-A-L, A006-2587-A-L and T031-2795-A-L) were analyzed, and showed results of ND(1.2), ND(5.7), and ND(0.44) pg/m^3, respectively.

5.2 INDUSTRIAL HYGIENE

During the site investigation, a comprehensive industrial hygiene monitoring program was conducted so that the adequacy of the assigned worker protection could be evaluated and demonstrated. The results of the program are discussed below.

5.2.1 Atmospheric Samples for Dioxin

Six personnel (glass-fiber filter) samples were collected during work on the 120 Lister Avenue site; one blank filter was also submitted for analysis. All six samples and the blank showed no detectable levels of dioxin.

Because of variation in air volumes sampled and background interferences, it was not always possible to attain a detection limit of 0.5 nanograms/cubic meter (ng/m^3) for the analysis. The detection limit achieved is shown in parentheses for each ND (not detected) result listed in Table 5.2.1-1.

5.2.2 Wipe Samples for Dioxin

Nine industrial hygiene wipe samples were collected for dioxin analysis, including three wipes from equipment used on site after being cleaned for release. Results are contained in Table 5.2.1-1. Eight of the nine samples showed no detectable level of dioxin. The last sample, 9100-2353-W-L, was a wipe of the stabilization cloth in the Decon area, and showed a positive result of 82.8 nanograms/square meter (ng/m^2). Although this level is below the acceptable level of 130 ng/m^2, the stabilization cloth was replaced.

5.2.3 Heat Stress

A Reuter Stokes heat stress monitor was used twice during April due to the potential for heat stress and related illness on these days. The measured results were compared to the American Conference of Governmental Industrial Hygienist recommended threshold limit value (TLV). An appropriate work-rest regimen was established at those times when the TLV was exceeded. Adjustments were made in these measurements due to amount of protective clothing and acclimatization period that takes place during the beginning of warmer months.

5.2.4 Noise Monitoring

Many significant sources of noise were monitored during this period. The D-5 dozer, bobcat, track hoe, backhoe, and forklift were monitored for noise. The D-5 dozer and bob cat were above the permissible exposure limit of 85 dBA for hearing protection requirements (88 and 90 dBA, respectively). Hearing protection was required while operating this equipment.

5.2.5 General Health and Safety

The procedures presented in the Work Plan were followed. All personnel entering the site were given one to two days of site-specific training, depending on the amount of health and safety training previously received. All IT employees and subcontractor employees were required to have medical examinations prior to entering the contamination zone. All personnel on site were required to wear the protective equipment prescribed in the Work Plan.

5.3 BUILDING AND STRUCTURES

Chip and wipe samples were collected from the buildings, tanks, trailers, and other equipment on site to evaluate potential contamination, as described in Subsection 4.2.3 of this report. All wipes and chips were analyzed for dioxin only.

5.3.1 Chip Sample Results

Table 5.3.1-1 summarizes the dioxin results for the 18 chip samples collected from the three buildings on the 120 Lister Avenue site; 6 chips were collected from each building. Positive dioxin results were obtained for half (9) of these samples; none exceeded the NJDEP-designated acceptable dioxin level of 7.0 ppb.

Table 5.3.1-2 lists each chip sample collected, with its location description, collection date (in numeric format), and dioxin result.

5.3.2 Wipe Sample Results

Sixteen wipe samples were collected from the tanks, trailers, and equipment located on site at the start of the field investigation. Table 5.3.2-1 lists these samples with their location descriptions, collection date, and dioxin analytical results. Only two positive results were obtained; both were well below the IT-designated clean level of 130 ng/m^2. This equipment was subsequently returned to the owners.

5.4 SOILS

The results of the subsurface soil investigation at the site are presented in the following subsections. These results include the subsurface lithology developed from the geotechnical boring logs (Appendix A) and the analytical laboratory data.

5.4.1 Subsurface Lithology

Twenty-three geotechnical borings were drilled on the site (Figure 4.2.4-1). Split-spoon and Shelby tube samples from the borings were logged according to both the USCS and Burmister classification system. Information from the borings drilled at 80 Lister Avenue was also used to aid in the definition of site subsurface conditions. Subsurface cross sections have been developed from the boring log data.

The plan locations of the cross sections are shown in Figure 4.2.4-1. Cross Sections A-A', B-B', C-C', and D-D' are presented in Figures 5.4.1-1 through 5.4.1-4. As can be seen from the figures, fill ranging in thickness from 6.5 to 10.5 feet is present at the surface. A thin layer of sand is present at about 20 feet below surface elevation. The fill is underlain by silt which is in turn underlain by glacio-fluvial sands. On the southern portion of the site, the silt consists of an upper layer which is more sandy and a lower layer with lenses of fine sand. On the northern portion of the site, the lower silt layer is becoming silty sand. Although bedrock was not encountered in any site borings, it is estimated to lie about 100 feet below the surface and is presumed to be interbedded sandstone and shale of the Brunswick

Formation. Standard penetration resistance (blow count) data are provided on the subsurface cross sections.

5.4.2 Analytical Laboratory Testing

Fifteen grid locations on the 120 Lister Avenue site were sampled for chemical analysis according to the Work Plan; an additional three biased locations were selected for full PP analysis by NJDEP. Table 5.4.2-1 lists the station grid locations sampled for analysis, and the analyses performed for each set of samples. According to the Work Plan, samples were to be collected from all remaining nodes of the site grid and archived for potential dioxin analysis. Detection of higher dioxin levels than expected in the initial soils analyzed (results issued February 11, 1985 - Appendix C) resulted in additional samples being assigned for dioxin analysis immediately upon collection. The top three samples from borings at Stations D-11-G, E-10-L, and E-11-N were analyzed as such, as well as two samples from the boring at Station E-11-P.

The remaining samples collected from all grid nodes were archived on site; a total of nine of these were eventually triggered for dioxin analysis in an effort to further define the "hot spots" detected on the site. Appendix C contains a list of the soil (and wipe) samples that were archived; those that have since been analyzed are identifiable by a "07" entry in the first column, for "Sample Status."

5.4.2.1 Summary Dioxin Results

A total of 95 soil samples from the 120 Lister Avenue site investigation were analyzed for 2,3,7,8-TCDD. Appendix C contains a listing of the final results for all of these samples, sorted by station location.

Table 5.4.2.1-1 summarizes the dioxin results according to the sample depths; results for each sample are also shown on the site cross-sections in Figures 5.4.1-1 through 5.4.1-4. With the exception of the very high levels detected in all samples from Station E-11-F (B-105), a clear decrease in dioxin concentration with depth is apparent.

Figures 5.4.2.1-1 through 5.4.2.1-3 present the results of the dioxin analyses for soils at 0 to 6 inches, 6 to 12 inches, and 12 to 24 inches, respectively, accordingly to their location on site.

5.4.2.2 Summary Priority Pollutant Results

A total of 42 soil samples from the 120 Lister Avenue site were analyzed for full PP parameters and 2,3,7,8-TCDD. Appendix D contains the complete results for each of these samples, including quantitative results for target compounds, tentative identifications, and semiquantitative results for extraneous peaks in the volatile and BNA fractions, a summary of the analysis level for each sample including dilutions, and a listing of the method detection limits.

Tables 5.4.2.2-1 through 5.4.2.2-3 summarize the organic compounds (volatiles, BNAs, pesticides, PCBs, herbicides, and dioxin) detected in the soil samples analyzed, according to sample depth. A clear decrease in both the number and concentration of analytes detected is observed with increasing sample depth. Of the 143 organic parameters, 41 were detected at 0 to 0.5 feet; 41 at 0.5 to 1.0 feet; 40 at 1.0 to 2.0 feet; 32 at 2.0 to 3.5 feet; 22 at 3.5 to 5.0 feet; 18 at 5.0 to 6.5 feet; 14 at 6.5 to 8.0 feet; 11 at 8.0 to 9.5 feet; and 11 at 9.5 to 11.0 feet.

Methylene chloride, fluoranthene, bis(2-ethylhexyl) phthalate, di-N-butylphthalate, phenanthrene, pyrene, benzo(a)anthracene, benzo(a)pyrene, chrysene, 4,4'-DDT, 4,4'-DDE, and 4,4'-DDD were detected in almost every sample from 0 to 2 feet depth. The concentrations of methylene chloride detected are typically attributable to background levels associated with sample handling, either during collection, shipping, or in the laboratory.

In the deeper samples analyzed, the same list of compounds is detected most frequently, with the concentrations decreasing significantly. In particular, 4,4'-DDT was detected in only one sample below 6.5 feet; 4,4'-DDE and 4,4'-DDD were not detected in any samples below this depth.

Tables 5.4.2.2-4 through 5.4.2.2-6 summarize the inorganic parameters detected in the 120 Lister Avenue soil samples. As for the organic parameters, both the number and concentration of analytes detected decrease with increasing sample depth. Zinc, copper, and lead were detected in every sample and showed the overall highest concentrations of all the inorganic parameters.

Selenium and thallium were not detected in any of the soil samples analyzed. The highest total cyanide and total phenols results obtained were 2.14 and 2.43 ppm, respectively.

5.4.2.3 Dioxin Results - Post-Remedial Soil Samples

Six soil samples were collected for dioxin analysis after excavation of five "hot spots" identified in the initial investigation samples. The "hot spots" are shown in Figure 4.2.4.3-1. Table 5.4.2.3-1 presents the dioxin results obtained for these samples. Excavations Nos. 1 and 3 were "clean," i.e., below the acceptable level of 7.0 ppb after the removal of 6 and 12 inches of soil, respectively. Excavation No. 2 required removal of 18 inches of soil before the dioxin level dropped to less than 7.0 ppb. Both Excavations Nos. 4 and 5 showed high levels of dioxin (19.1 and 31.0 ppb, respectively) after 12 inches of soil was removed; no further testing was performed on samples from these locations.

5.5 GROUND WATER

The results of the ground water investigation at the site are presented in the following subsections. The results include monitoring well levels, the determination of hydraulic conductivities from field slug test data, and the chemical analysis data for the ground water samples.

5.5.1 Ground Water Levels

Ground water levels were observed on February 13, 1985 in three monitoring wells installed at the site (Figure 4.2.5-1). A summary of the observed levels and a comparison of monitoring well levels at 80 Lister Avenue and Passaic River levels measured on this date are provided in Table 5.5.1-1.

5.5.2 Hydraulic Conductivities

The slug test data were incrementally digitized from the continuous strip chart data taken in the field. This was done by selecting an arbitrary datum and scaling off values of time and pin deflection as a percent of full scale. Data reduction was accomplished using special forms to compute the value for head in feet for each selected time. The data were then input to the computer program SLUGT.

The program SLUGT computes aquifer transmissivity (T) and hydraulic conductivity (k) using two independent methods. The first method is the method of Cooper, Bredehoeft, and Papadopoulos (1967) and applies to confined aquifer conditions for fully penetrating wells. The second method is the method of Bouwer and Rice (1976) and applies to unconfined aquifers for fully or partially penetrating wells.

SLUGT computes T and k values two ways under the second method. In the first case, the diameter of the drilled hole is taken as the diameter of the well and, whenever water level recovery occurs within the well screen, the cross-sectional area of the drilled hole corrected for the presence of the gravel pack is taken as the cross-sectional area of water level recovery. In the second case, the well casing or screen is used in the computation for both the well diameter and cross-sectional area of the water level recovery. A compilation of the results indicating the computed hydraulic conductivities in each case is presently being processed and will be available in the July 3 report.

5.5.3 Analytical Laboratory Testing

Ground water samples were collected from each of the three on-site monitoring wells on February 13, 1985; a second sampling effort on March 6, 1985 yielded samples from only two of the wells, due to damage to the third well making collection impossible. All five of the ground water samples collected were analyzed for full priority pollutants and dioxin; complete results are tabulated in Appendix E.

Table 5.5.3-1 summarizes the detected organic compounds in the five ground water samples. Dioxin was not detected in any of the water samples; a total of 23 organic compounds were detected at least once. Benzene, chlorobenzene, and 4,4'-DDT were detected with the highest frequency. Methylene chloride was detected in all of the samples, but at levels attributable to contamination associated with sample handling.

Table 5.5.3-2 summarizes the detected inorganic parameters in the ground water samples. Zinc, lead, and copper show the highest concentrations of all the inorganic parameters and were detected in every water sample. Selenium was

not detected in any of the water samples. The highest total cyanide and total phenols values observed were 0.06 and 3.3 ppm, respectively.

5.6 DRUM SAMPLES

The 15 drum samples listed in Table 5.6-1 were analyzed for the parameters listed in Table 4.1.4-1, with the exception of dioxin; the samples were placed on hold for possible dioxin analysis after the initial analyses were performed and remain in archive at this time. Table 5.6-2 is a summary of the hazardous characterization/compatibility analysis results for each drum sample. Tables 5.6-3 and 5.6-4 summarize EP toxicity leachate analysis results for metals and pesticides/herbicides, respectively. Table 5.6-5 is a summary of the PCB screen analysis results for each drum sample.

5.7 ADDITIONAL SAMPLES

5.7.1 Surface Water

Surface water from the 120 Lister Avenue site was sampled twice for analysis of dioxin and several classical parameters, including COD, BOD, TOC, and TTS. On one of the sampling occasions, the water had been pumped into a holding tank for storage prior to discharge. These analyses were part of predisposal activities for the site water.

Table 5.7.1-1 presents the results of all parameters analyzed for these samples.

5.7.2 Samples Collected Concurrent with Phase I

During the 80 Lister Avenue site investigation, conducted September to November, 1984, 102 samples were also collected from the 120 Lister Avenue site, including soils, chips, and wipes. Seventeen of these were analyzed for dioxin; results are presented in Table 5.7.2.-1. The remaining 85 samples were archived for possible future analysis. Appendix F contains a list of the archived samples.

5.7.3 Decon Water

One composite sample of the decon water used in all aspects of the off-site work (including showers, cleaning equipment, etc.) was collected and analyzed

for dioxin, BOD, TSS, and TOC. The water was stored in three tanks on the 80 Lister Avenue site; analysis was performed to provide information necessary to determine appropriate discharge procedures. Results are provided in Table 5.7.3-1.

5.8 ANALYTICAL RESULTS FOR QUALITY ASSURANCE/QUALITY CONTROL CHECKS

QA/QC checks were performed routinely throughout the project sampling and analysis activities. Several levels of QC checks were implemented, including field/trip blanks, individual laboratory analysis-specific QC measures, and specific QC samples initiated by the NJDEP.

Precision, accuracy, and completeness objectives used for the analytical program were those established in the 80 Lister Avenue Work Plan, and are presented in Table 5.8-1. Similar QC acceptance criteria were available for those analyses performed under EPA's CLP protocol. Where available, these analyte-specific acceptance limits were used.

5.8.1 Sampling Quality Control Checks: Field and Trip Blanks

Table 5.8.1-1 summarizes the field blanks collected in association with each sample matrix, and the percent of blanks to total samples collected for each case. The overall goal (number of blanks equal to 5 percent of the total number of samples collected) was realized. Trip blanks were collected with each field blank (i.e., a field and trip blank pair) for solid and water samples.

Analytical results for all field and trip blanks associated with solid and water samples are presented in Appendix G. The field and trip blank pair analyzed for dioxin in association with soil samples gave the following results:

Sample No.	Description	TCDD Result
F037-2629-H-L	Field Blank	ND (.0033 ppb)
T023-2630-H-L	Trip Blank	ND (.011 ppb)

No significant contamination was detected in any of these blanks. Volatile analysis did indicate low levels of chloroform, methylene chloride, and acetone in many of the blanks; none of the results was high enough to significantly affect the quality of the sample results. One wipe field blank

showed a positive dioxin result: F024-2485-W-L (February 12, 1985) at 12.4ng. Both wipe samples collected on that date showed no detectable dioxin; no re-sampling was scheduled.

The single chip field blank showed no detectable level of dioxin.

5.8.2 Individual Laboratory Quality Control Checks

Each of the four participating analytical laboratories performed specific QC checks in association with analysis of the 120 Lister Avenue samples, including regular instrument calibration, use of surrogate and internal standards, and a minimum of one spike/duplicate pair for every set of 20 samples analyzed. All of the off-site samples were analyzed as a single project group by the laboratories, i.e., they were not segregated by site location; therefore, a complete discussion of the QC results will be provided in the final off-site evaluation report, to be issued July 1985.

The 120 Lister Avenue samples reported on February 11, 1985 were analyzed as a separate set of samples by the dioxin laboratory, so the dioxin lab QC results are available at this time. The following paragraphs summarize these early QC results; a complete discussion of all dioxin QC will be provided in the final report.

5.8.2.1 Method Blanks - Dioxin

Method blanks were analyzed every eight hours, or at least once for each batch of up to 20 samples; support data for these routine checks are contained in the complete laboratory batch reports. No contamination was detected in any of the method blanks analyzed with the 120 Lister Avenue samples.

5.8.2.2 Spike/Duplicate Pairs

A sample spike and duplicate pair were analyzed with each batch of up to 20 samples. Five QC sample pairs were analyzed with the initial set of 120 Lister Avenue samples, representing 6 percent of the 83 soil and chip samples reported at that time.

Table 5.8.2.2-1 summarizes the duplicate sample results. Three pairs show one positive and one nondetected result; in two cases, the positive results are below 1.0 ppb, and the differences are not considered significant.

Table 5.8.2.2-2 summarizes the spike recovery data for the QC samples. The average percent recovery is 99 percent.

5.8.3 NJDEP - Designated Quality Control Checks

The NJDEP OSC initiated two types of QC samples: (1) collection of sample splits in the field, for analysis at an independent laboratory in addition to the IT laboratories, and (2) assignment of soil proficiency samples for dioxin analysis.

Table 5.8.3-1 lists the 120 Lister Avenue samples split at the time of collection at the direction of the OSC. IT results for these samples, for the analyses indicated, are reported herein with all other analytical results.

Table 5.8.3-2 lists the results available at this time for the NJDEP soil proficiency samples. All remaining proficiency sample results will be included in the final off-site evaluation report.

TABLES

TABLE 5.1-1

AMBIENT AIR RESULT FROM 120 LISTER AVENUE
FOR 2,3,7,8-TCDD

SAMPLE NUMBER	METEOROLOGICAL CONDITIONS	SAMPLER LOCATION(a)	WIND SPEED MAXIMUM(b) (mph)	PREVAILING WIND DIRECTION(c)	SAMPLE PERIOD START (date/time)	SAMPLE PERIOD STOP (date/time)	VOLUME SAMPLE (m^3)	DIOXIN CONC. (pg/m^3)
A006-2101-A-L	Partly Cloudy	Southwest	-	-	1-17/1204	1-18/1400	272.0	N.D.(3.0)
A006-2102-A-L	Partly Cloudy	Northeast	-	-	1-17/1244	1-18/1420	306.2	N.D.(1.3)
A006-2490-A-L	Partly Cloudy/Upper 30°'s	Northeast	5.5	WSW	2-14/1033	2-15/1034	362.9	N D.(28.0)
A006-2516-A-L	Sunny/30°'s-40°'s	Northeast	5.0	WSW	2-16/0915	2-18/1116	752.7	N.D.(10.7)
A006-2637-A-L	Partly Cloudy/40°'s	Northeast	9.5	Variable	3-6/1540	3-7/1435	299.6	N.D.(5.7)
A006-2640-A-L	Rain/40°'s	Northeast	8.5	WSW	3-7/1445	3-8/0930	202.3	N.D.(4.2)
A006-2685-A-L	Sunny	Northeast	10.0	W	3-16/1030	3-18/1645	132.9	N.D.(15.0)
A006-2707-A-L	-	Northeast	12.5	Variable	3-22/1108	3-28/1041	522.7	N.D.(5.4)
A006-2717-A-L	-	Southwest	12.5	Variable	3-22/1053	3-28/1105	1,222.0	N.D.(2.5)
A006-2718-A-L	Clear/40°'s-70°'s	East	12.5	Variable	3-25/1750	3-28/1052	401.9	N.D.(7.7)
A006-2732-A-L	-	East	12.5	WSW	3-28/1058	3-30/1125	133.8	N.D.(28.4)
A006-2749-A-L	Rain/50°'s	Northeast	10.0	Variable	3-30/1150	4-1/1600	473.8	N.D.(0.9)
A006-2756-A-L	Rain/50°'s	East	11.5	W	4-1/1625	4-2/1602	265.2	33.5(d)

(a)Sampler locations are denoted as per Section 4.2.1 (Figure 4.2.1-1).

(b)Wind speed is a maximum recorded for a one hour average.

(c)Prevailing wind direction is reported as the direction from which the wind was blowing.

(d)Tentatively identified ion ratio for M/Z 257, due to matrix interference, did not meet indentification criteria.

TABLE 5.2.1-1

INDUSTRIAL HYGIENE MONITORING RESULTS

SAMPLE NO.	DESCRIPTION	DIOXIN RESULT
A006-2537-A-L	IH Glass Fiber Filter: Personnel	ND (5.58 ng/m^3)
A006-2538-A-L	IH Glass Fiber Filter: Personnel	ND (4.49 ng/m^3)
A006-2539-A-L	IH Glass Fiber Filter: Area Sample	ND (3.37 ng/m^3)
A006-2631-A-L	IH Glass Fiber Filter: Personnel	ND (0.72 ng/m^3)
A006-2632-A-L	IH Glass Fiber Filter: Personnel	ND (0.39 ng/m^3)
A006-2633-A-L	IH Glass Fiber Filter: Personnel	ND (0.32 ng/m^3)
A006-2635-A-L	IH Glass Fiber Filter: Field Blank	ND (0.47 ng/sample)
9100-2353-W-L	IH Wipe: Decon Area	82.8 ng/m^2
9100-2354-W-L	IH Wipe: Shower Trailer	ND (20.0 ng/m^2)
9100-2355-W-L	IH Wipe: Respirators	ND (16.7 ng/m^2)
9100-2671-W-L	IH Wipe: Decon Floor	ND (21.2 ng/m^2)
9100-2672-W-L	IH Wipe: Shower Trailer Floor	ND (75.2 ng/m^2)
9100-2675-W-L	IH Wipe: Lab Trailer Floor	ND (1.6 ng/m^2)
9200-2459-W-L	IH Wipe: Empire Drill Rig	ND (8.2 ng/m^2)
9100-2814-W-L	IH Wipe: Steel auger used to set telephone poles	ND (4.0 ng/m^2)
9100-2850-W-L	IH Wipe: Komatsu Track Hoe used in excavation of hot spots	14.4 ng/m^2

TABLE 5.3.1-1

SUMMARY OF 2,3,7,8-TCDD RESULTS
120 LISTER AVENUE CHIP SAMPLES

LOCATION	NUMBER OF SAMPLES	NUMBER OF POSITIVE RESULTS	CONCENTRATION RANGE (ppb)
Brick Building	6	4	0.13-1.1
Block Building	6	1	0.39
Tile Building	6	4	0.67-6.3

TABLE 5.3.1 - 2

2,3,7,8 - TCDD Results

120 Lister Avenue Chip Samples

Number	Sample Description	Date	Results
4100-2014-C-L	Chip-Brick Bldg, Interior, N.W. Corner	850115	0.27 ppb
4501-2015-C-L	Chip-Brick Bldg, Exterior, N.W. Corner	850115	ND (0.30 ppb)
4100-2016-C-L	Chip-Brick Bldg, Interior, S.E. Corner	850115	0.48 ppb
4400-2017-C-L	Chip-Brick Bldg, Roof	850115	1.1 ppb
4100-2018-C-L	Chip-Brick Bldg, Floor	850115	0.13 ppb
4503-2019-C-L	Chip-Brick Bldg, Exterior, S.E. Corner	850115	ND (0.30 ppb)
5100-2057-C-L	Chip-Block Bldg, Interior, N.W. Corner	850116	ND (0.30 ppb)
5501-2058-C-L	Chip-Block Bldg, Exterior, N.W. Corner	850116	ND (0.23 ppb)
5100-2059-C-L	Chip-Block Bldg, Interior, S.E. Corner	850116	ND (5.0 ppb)
5300-2060-C-L	Chip-Block Bldg, Exterior, S.E. Corner	850116	ND (0.10 ppb)
5100-2061-C-L	Chip-Block Bldg, High Traffic	850116	ND (0.40 ppb)
5400-2062-C-L	Chip-Block Bldg, Roof	850116	0.39 ppb
9300-2178-C-L	Chip-Tile Bldg,NW Corner,Interior,High/Mid/Low ea wal	850119	1.1 ppb
9300-2179-C-L	Chip-Tile Bldg,SE Corner,Interior,High/Mid/Low ea wal	850119	1.9 ppb
9300-2180-C-L	Chip-Tile Bldg,NW Corner,Exterior,High/Mid/Low ea wal	850119	ND (1.0 ppb)
9300-2181-C-L	Chip-Tile Bldg,SE Corner,Exterior,High/Mid/Low ea wal	850119	ND (0.90 ppb)
9300-2182-C-L	Chip-Tile Bldg, Floor, High Traffic Area	850119	6.3 ppb
9300-2183-C-L	Chip-Tile Bldg, Roof	850119	0.67 ppb

TABLE 5.3.2 - 1

2,3,7,8 TCDD Results

120 Lister Avenue Samples

Number	Sample Description	Date	Results
9300-2231-W-L	Wipe-Composite of vert.tank 1 & horiz. tank 2,in&out	850128	ND (54 ng/meter2)
9300-2232-W-L	Wipe-Composite of horiz. tank 3 & vert. tank 4,in&out	850128	ND (54 ng/meter2)
9300-2233-W-L	Wipe-Composite of horiz. tank 5 & 6, outside legs	850128	ND (10 ng/meter2)
9300-2234-W-L	Wipe-Composite of Blower 7 & duct elbow 8, in & out	850128	ND (10 ng/meter2)
9300-2235-W-L	Wipe-Composite of Horiz. tank 9 & 10, outside	850128	ND (4.0 ng/meter2)
9300-2237-W-L	Wipe-Comp. of Vert. tank 11 out & Horiz. tank 12,out	850128	ND (12 ng/meter2)
9300-2238-W-L	Wipe-Comp. of #13 sheet metal hood & #14 column	850128	7.9 ng/meter2
9300-2239-W-L	Wipe-Comp. of Trough # 15 & 16, in & out	850128	ND (8.3 ng/meter2)
9300-2240-W-L	Wipe-Comp. of Vert. tank 17 & 18, outside	850128	11.0 ng/meter2
9300-2241-W-L	Wipe-Comp. of Vert. tank 19 & 20, outside	850128	ND (5.8 ng/meter2)
9300-2501-W-L	Wipe-Tank Trailer, Ser.#UNP461001, Comp. of 2	850214	ND (31 ng/meter2)
9300-2511-W-L	Wipe-Trailer #503, Comp. of 2, top & under carriage	850215	ND (8.0 ng/meter2)
9300-2512-W-L	Wipe-Tank #S-01, Blue Fiberglass, Comp. of 2 wipes	850301	ND (4.0 ng/meter2)
9300-2513-W-L	Wipe-Tank # S-02, Rusty steel vessel, Comp. of 2 wipe	850216	ND (4.0 ng/meter2)
9300-2518-W-L	Wipe-Truck Axle #S-03, Composite of 2 wipes	850216	ND (20 ng/meter2)
9200-2519-W-L	Wipe-Truck Fifth Wheel #S-04, Comp. of 2 wipes	850216	ND (4.6 ng/meter2)

TABLE 5.4.2-1

ANALYSES REQUESTED FOR 120 LISTER AVENUE
SOIL SAMPLES

STATION	SAMPLE TYPE	NO. OF SAMPLES	ANAYSES REQUESTED
C-8-D	Near Surface	3	2,3,7,8-TCDD
C-9-D	Near Surface	3	2,3,7,8-TCDD
C-10-H	Near Surface	3	Full PP + 2,3,7,8-TCDD
D-8-I	Near Surface	2	Full PP + 2,3,7,8-TCDD
D-10-D	Near Surface	1	2,3,7,8-TCDD
D-12-D	Soil Boring	7	Full PP + 2,3,7,8-TCDD
E-10-D	Near Surface	3	2,3,7,8-TCDD
E-11-F	Near Surface	3	Full PP + 2,3,7,8-TCDD
E-12-G	Near Surface	1	2,3,7,8-TCDD
F-9-G	Soil Boring	6	Full PP + 2,3,7,8-TCDD
G-10-D	Near Surface	2	2,3,7,8-TCDD
G-11-D	Near Surface	3	2,3,7,8-TCDD
H-9-D	Near Surface	3	2,3,7,8-TCDD
H-12-D	Near Surface	3	Full PP + 2,3,7,8-TCDD
J-11-D	Near Surface	3	2,3,7,8-TCDD
K-9-D	Soil Boring	9	Full PP + 2,3,7,8-TCDD
K-10-D	Near Surface	1	2,3,7,8-TCDD
K-12-B	Soil Boring	9	Full PP + 2,3,7,8-TCDD

TABLE 5.4.2.1-1

SUMMARY OF 2,3,7,8-TCDD RESULTS WITH DEPTH
120 LISTER AVENUE SOILS

DEPTH	NO. OF SAMPLES ANALYZED	NO. OF POSITIVE RESULTS	CONCENTRATION RANGE (ppb)	CONCENTRATION RANGE (ppb) EXCLUDING E-11-F SAMPLES
0.0'-0.5'	25	21	0.48-94.0	0.48-94.0
0.5'-1.0'	19	13	0.58->490.	0.58-24.3
1.0'-2.0'	16	10	0.76-97.0	0.76-11.0
2.0'-3.5'	6	5	0.34-155.	0.34-6.1
3.5'-5.0'	6	5	0.19-73.5	0.19-4.0
5.0'-6.5'	5	4	0.23-93.7	0.23-0.72
6.5'-8.0'	4	2	0.60-61.5	0.60
8.0'-9.5'	3	2	0.84-69.1	0.84
9.5'-11.0'	3	2	0.54-17.4	0.54

TABLE 5.4.2.3-1

2,3,7,8-TCDD RESULTS:
120 LISTER POST-REMEDIAL SOIL SAMPLES

SAMPLE NO.	DESCRIPTION	ppb
RS-1-2624-100-S-L	Excavation No. 1 - Composite of 5 0-3" takes from excavation grade (6")	ND(0.66)
RS-2-2625-100-S-L	Excavation No. 2 - Composite of 5 0-3" takes from excavation grade (12")	7.5
RS-2-2714-100-S-L	Excavation No. 2 - Composite of 5 0-3" takes from new excavation grade (12")	0.47
RS-3-2626-100-S-L	Excavation No. 3 - Composite of 5 0-3" takes from excavation grade (12")	2.5
RS-4-2627-100-S-L	Excavation No. 4 - Composite of 5 0-3" takes from excavation grade (12")	19.1
RS-5-2628-100-S-L	Excavation No. 5 - Composite of 5 0-3" takes from excavation grade (12")	31.0

TABLE 5.5.1-1

SUMMARY OF MONITORING WELL DATA

	WELL NUMBER	GROUND WATER ELEVATIONS(a)	GROUND SURFACE ELEVATION(a) (ft)	DEPTH TO TOP OF SCREEN(b) (ft)	DEPTH TO BOTTOM OF SCREEN(b) (ft)	TIME (Hour)
120	MW-101A	96.90	97.1	1.5	6.5	(9:06 a.m.)(d)
LISTER	MW-101A	92.44	97.1	1.5	6.5	(12:15 p.m.(e)
AVENUE	MW-102A	96.33	97.6	1.1	7.0	(9:15 a.m.)(d)
	MW-102A	91.83	97.6	1.1	7.0	(1:00 p.m.(e)
	MW-103A	92.94	97.4	5.5	10.5	(9:11 a.m.)(d)
80	MW-1A	92.04	98.7	3.5	14.2	(10:00 a.m.)(d)
LISTER	MW-2A	92.71	98.9	3.5	15.2	(9:45 a.m.)(d)
AVENUE	MW-3A	94.53	97.3	3.0	8.5	(9:40 a.m.)(d)
	MW-4A	98.88	97.6	2.0	7.0	(9:20 a.m.)(d)
	MW-5A	96.25	98.9	3.0	8.5	(10:10 a.m.)(d)
	MW-6A	95.66	98.9	1.9	7.9	(10:15 a.m.)(d)
	MW-7A	98.49	98.4	2.0	8.2	(10:05 a.m.)(d)
	MW-8A	98.44	97.7	2.0	7.0	(9:30 a.m.)(d)
	MW-9A	96.77	98.0	3.7	8.2	(9:50 a.m.)(d)
	MW-10A	95.69	99.7	6.0	12.0	(2:30 p.m.)(d)
	MW-11A	91.17	99.7	23.5	33.0	(2:32 p.m.)(d)
PASSAIC RIVER	NA(c)	NA(c)	NA(c)	NA(c)	NA(c)	(9:43 a.m.)(d)

(a)Elevations are with respect to site datum.

(b)Depths are with respect to ground water surface.

(c)Not applicable.

(d)February 13, 1985

(e)March 6, 1985

TABLE 5.5.3-1

SUMMARY OF DETECTED ORGANIC COMPOUNDS
120 LISTER AVENUE GROUND WATER

COMPOUND	NUMBER OF SAMPLES ANALYZED	NUMBER OF POSITIVE RESULTS	CONCENTRATION RANGE (ppb)
2,3,7,8-TCDD	5	0	-
Benzene	5	4	3.0-400.
Chlorobenzene	5	4	12.-360.
Methylene Chloride	5	5	2.0-61.
Tetrachloroethene	5	1	1.0
Toluene	5	2	0.8-2.8
Trichloroethene	5	1	1.0
Acetone	5	2	3.6-38.
2-Chlorophenol	5	1	320.
2,4-Dichlorophenol	5	2	770.-790.
Acenaphthene	5	1	11.
Fluoranthene	5	1	57.
Naphthalene	5	1	18.
Bis(2-ethylhexyl phthalate)	5	2	7.0-24.
Benzo(A)anthracene	5	1	19.
Benzo(B)fluoranthene	5	1	21.
Anthracene	5	1	19.
Phenanthrene	5	2	23.-57.
Pyrene	5	2	3.0-55.
4,4'-DDT	5	4	0.3-2.5
4,4'-DDE	5	3	0.1-3.2
4,4'-DDD	5	3	0.1-1.8
β-BHC	5	1	0.3
2,4-D	5	2	2.9-12.

TABLE 5.5.3-2

SUMMARY OF DETECTED INORGANIC COMPOUNDS
120 LISTER AVENUE GROUND WATER

COMPOUND	NUMBER OF SAMPLES ANALYZED	NUMBER OF POSITIVE RESULTS	CONCENTRATION RANGE (ppb)
Antimony	5	3	.008-.07
Arsenic	5	5	.016-.279
Beryllium	5	5	.002-.024
Cadmium	5	3	.005-.02
Chromium	5	5	.04-.32
Copper	5	5	.059-1.46
Lead	5	5	.23-6.6
Mercury	5	5	.001-0.062
Nickel	5	5	.01-.30
Silver	5	5	.002-.02
Thallium	5	1	.02
Zinc	5	5	.417-36.
Total Cyanide	5	2	.04-.06
Total Phenols	5	5	.01-3.3

TABLE 5.6.-1

DRUM SAMPLES COLLECTED FROM 120 LISTER AVENUE

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION
0001-2423-D-W	Drum #B, very light yellow translucent liquid
0003-2425-D-W	Drum #G, hard white paint-like solid w/tan gel top
0004-2426-D-W	Drum #J, brown and black paint-like liquid
0006-2428-D-W	Drum #M, translucent forest green liquid
0007-2429-D-W	Drum #N, translucent pink liquid-like syrup
0008-2430-D-W	Drum #O, translucent green liquid-like syrup
0009-2431-D-W	Drum #P, brownish-orange paste-like liquid
0010-2432-D-W	Drum #Q, brown paste-like liquid
0011-2433-D-W	Drum #R, slightly viscous brown liquid with debris
0012-2434-D-W	Drum #S, medium brown viscous liquid
0013-2504-D-W	Drum #C, red gel-like elastic solid
0014-2505-D-W	Drum #F, Brownish-yellow elastic solid w/paint at bottom
0016-2562-D-W	Drum #T, Greenish liquid w/ sludge on drum bottom
0017-2563-D-W	Drum #U, Very viscous yellow liquid
0018-2564-D-W	Drum #V, Highly viscous orange liquid
0026-2662-D-W	Drum #W, Brown liquid with some solids
0027-2663-D-W	Drum #Y, Brown liquid with solids
0028-2664-D-W	Drum #Z, Green solids and water

TABLE 5.6-2

HAZARDOUS CHARACTERIZATION/COMPATABILITY ANALYSIS SUMMARY
OF DRUM SAMPLES FROM 120 LISTER AVENUE

PARAMETER	SAMPLE IDENTIFICATION				
	0001-2423 D-P (Liquid)	0003-2425 D-P (Sludge)	0004-2426 D-P (Liquid/Sludge)	0006-2428 D-P (Liquid)	0007-2429 D-P (Liquid with Black Particles)
Bielstein's Halogen Test	Negative	Negative	Positive	Negative	Negative
Open-cup Flash Point	60°F	63°F	102°F	66°F	70°F
Open-cup Ignitability	Positive/ Rapid/Sooty	Positive/ Rapid/Sooty	Positive/ Rapid/Sooty	Positive/ Rapid/Sooty	Positive/ Rapid/Sooty
Oxidizable Material	Negative	Negative	Negative	Negative	Negative
pH (paper determination)	6.0	6.0	6.0	6.0	6.0
Nitric Acid (pH <3)	NR(a)	NR	NR	NR	NR
Cyanide (pH >3)	Negative	Negative	Negative	Negative	Negative
Sulfide (pH >3)	Negative	Negative	Negative	Negative	Negative
Peroxide	Negative	Negative	Negative	Negative	Negative
Reactivity (water):					
Solubility	Slight	None	None	None	Slight
Temperature of Reactivity	No Change	No Change	No Change	No Change	No Change

TABLE 5.6-2
(Continued)

PARAMETER	SAMPLE IDENTIFICATION 0008-2430 D-P (Liquid)	0009-2431 D-P (Sludge)	0010-2432 D-P (Viscous Liquid with Particulates)	0011-2433 D-P (Viscous Liquid)	0012-2434 D-P (Viscous Liquid)
Bielstein's Halogen Test	Negative	Positive	Negative	Negative	Positive
Open-cup Flash Point	76°F	68°F	139°F	135°F	88°F
Open-cup Ignitability	Positive/ Rapid/Sooty	Positive/ Rapid/Sooty	Positive/ Rapid/Sooty	Positive/ Rapid/Sooty	Positive/ Rapid/Sooty
Oxidizable Material	Negative	Negative	Negative	Negative	Negative
pH (paper determination)	6.0	6.0	6.0	6.0	6.0
Nitric Acid (pH <3)	NR	NR	NR	NR	NR
Cyanide (pH >3)	Negative	Negative	Negative	Negative	Negative
Sulfide (pH >3)	Negative	Negative	Negative	Negative	Negative
Peroxide	Negative	Negative	Negative	Negative	Negative
Reactivity (water):					
Solubility	None	None	None	None	None
Temperature of Reactivity	No Change	No Change	No Change	No Change	No Change

TABLE 5.6-2
(Continued)

PARAMETER	SAMPLE IDENTIFICATION 0013-2504 D-W (Sludge)	0014-2505 D-W (Sludge)	0016-2562 D-W (Liquid)	0017-2563 D-W (Sludge)
Bielstein's Halogen Test	Negative	Negative	Negative	Negative
Open-cup Flash Point	130°F	>140°F	133°F	>140°F
Open-cup Ignitability	Positive/ Rapid/Sooty	Negative	Positive/ Rapid/Sooty	Negative
Oxidizable Material	Negative	Negative	Negative	Negative
pH (paper determination)	4.0	6.0	6.0	4.0
Nitric Acid (pH <3)	NR	NR	NR	NR
Cyanide (pH >3)	Negative	Negative	Negative	Negative
Sulfide (pH >3)	Negative	Negative	Negative	Negative
Peroxide	Negative	Negative	Negative	Negative
Reactivity (water):				
Solubility	None	None	None	None
Temperature of Reactivity	No Change	No Change	No Change	No Change

TABLE 5.6-2
(Continued)

PARAMETER	SAMPLE IDENTIFICATION 0018-2564 D-W (Sludge)	0026-2662 D-W (Liquid)	0027-2663 D-W (Liquid)	0028-2664 D-W (Liquid)
Bielstein's Halogen Test	Negative	Negative	Negative	Negative
Open-cup Flash Point	>140°F	>140°F	>140°F	>140°F
Open-cup Ignitability	Positive/ Slow/Sooty	Positive/ Slow/Sooty	Positive/ Slow/Sooty	Negative
Oxidizable Material	Negative	Negative	Negative	Negative
pH (paper determination)	6.0	6.0	6.0	11.0
Nitric Acid (pH <3)	NR	NR	NR	NR
Cyanide (pH >3)	Negative	Negative	Negative	Negative
Sulfide (pH >3)	Negative	Negative	Negative	Negative
Peroxide	Negative	Negative	Negative	Negative
Reactivity (water):				
Solubility	None	None	Slight	Slight
Temperature of Reactivity	No Change	No Change	No Change	No Change

(a)NR indicates that the corresponding analysis was not required due to sample pH.

TABLE 5.6-3

EP TOXICITY LEACHATE ANALYSIS SUMMARY
OF METALS FOR 120 LISTER AVENUE DRUM SAMPLE

		SAMPLE IDENTIFICATION				
PARAMETER(c)	UNITS[a]	0001-2423-D-P	0003-2425-D-P	0004-2426-D-P	0006-2428-D-P	0007-2429-D-P
Arsenic	mg/ℓ	<0.001/<0.001(b)	<0.001	<0.001	<0.001	<0.001
Barium	mg/ℓ	0.04	0.09	0.09	0.08	0.11
Cadmium	mg/ℓ	0.001	0.001	<0.001	<0.001	<0.001
Chromium	mg/ℓ	0.03	0.07	0.05	0.07	0.07
Lead	mg/ℓ	0.19/0.20	0.10	0.04	0.04	0.05
Mercury	mg/ℓ	0.0013	<0.0002	<0.0002/<0.0002(b)	<0.0002	0.0004
Selenium	mg/ℓ	<0.001/<0.001(b)	<0.001	<0.001	<0.001	<0.001
Silver	mg/ℓ	<0.001	<0.001	<0.001	<0.001	<0.001

See footnotes at end of table.

TABLE 5.6-3
(Continued)

PARAMETER(c)	UNITS[a]	SAMPLE IDENTIFICATION 0008-2430-D-P	0009-2431-D-P	0010-2432-D-P	0011-2433-D-P	0012-2434-D-P
Arsenic	mg/ℓ	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	mg/ℓ	0.10	0.11	0.12	0.16	0.12
Cadmium	mg/ℓ	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/ℓ	0.06	0.05	0.07	0.04	0.08
Lead	mg/ℓ	0.01	0.02	0.04	0.11	0.03
Mercury	mg/ℓ	<0.0002	0.0003	<0.0002	<0.0002	<0.0002
Selenium	mg/ℓ	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/ℓ	<0.001	<0.001	<0.001	<0.001	<0.001

See footnotes at end of table.

TABLE 5.6-3
(Continued)

PARAMETER(c)	UNITS[a]	SAMPLE IDENTIFICATION 0013-2504-D-W	0014-2505-D-W	0016-2562-D-W	0017-2563-D-W
Arsenic	mg/ℓ	<0.001/<0.001(b)	<0.001	<0.001	<0.001
Barium	mg/ℓ	0.01	<0.01	<0.01	<0.01
Cadmium	mg/ℓ	<0.001	<0.001	0.001	<0.001
Chromium	mg/ℓ	<0.01	<0.01	<0.01	0.02
Lead	mg/ℓ	0.03	0.02	0.08	0.08
Mercury	mg/ℓ	0.0003	<0.0002	<0.0002	<0.0002
Selenium	mg/ℓ	0.005	0.003	0.002	0.002
Silver	mg/ℓ	<0.01	<0.01	0.01	0.01

See footnotes at end of table.

TABLE 5.6-3
(Continued)

PARAMETER(c)	UNITS[a]	SAMPLE IDENTIFICATION 0018-2564-D-W	0026-2662-D-W	0027-2663-D-W	0028-2664-D-W
Arsenic	mg/ℓ	<0.001	0.002	0.002	0.004/0.004
Barium	mg/ℓ	<0.01	0.02	<0.01	0.03/0.04
Cadmium	mg/ℓ	<0.001	<0.001	<0.001	<0.001/<0.001(b)
Chromium	mg/ℓ	<0.01	0.013	0.008	0.004/0.003
Lead	mg/ℓ	0.04	0.03	0.02	0.02/0.02
Mercury	mg/ℓ	<0.0002	<0.0002	<0.0002/<0.0002(b)	<0.0002
Selenium	mg/ℓ	0.002	<0.001	<0.001	<0.001/<0.001(b)
Silver	mg/ℓ	0.01/0.01	<0.001	<0.001	<0.001/<0.001(b)

(a)mg/ℓ = milligrams per liter or parts per million

(b)The indicated sample was analyzed in duplicate for the corresponding parameter.

(c)Arsenic, barium, cadmium, selenium,and silver analyzed by Graphite Furnance AA. Chromium and lead analyzed by Flame AA, mercury analyzed by Cold Vapor. All methods were following procedures found in SW-846.

TABLE 5.6-4

EP TOXICITY LEACHATE ANALYSIS SUMMARY
OF PESTICIDES AND HERBICIDES FOR 120 LISTER AVENUE DRUM SAMPLES

		SAMPLE IDENTIFICATION				
PARAMETER	UNITS(a)	0001-2423-D-P	0003-2425-D-P	0004-2426-D-P	0006-2428-D-P	0007-2429-D-P
Endrin	mg/ℓ	<0.005	<0.005	<0.005	<0.005	<0.005/<0.005(b)
Lindane	mg/ℓ	<0.04	<0.04	<0.04	<0.04	<0.04/<0.04(b)
Methoxychlor	mg/ℓ	<0.10	<0.10	<0.10	<0.10	<0.10/<0.10(b)
Toxaphene	mg/ℓ	<0.05	<0.05	<0.05	<0.05	<0.05/<0.05(b)
2,4-D	mg/ℓ	<0.50	<0.50	<0.50	<0.50/<0.50(b)	<0.50
2,4,5-TP (Silvex)	mg/ℓ	<0.05	<0.05	<0.05	<0.05/<0.05(b)	<0.05

See footnotes at end of table.

TABLE 5.6-4
(Continued)

PARAMETER	UNITS(a)	SAMPLE IDENTIFICATION 0008-2430-D-P	0009-2431-D-P	0010-2432-D-P	0011-2433-D-P	0012-2434-D-P
Endrin	mg/ℓ	<0.005	<0.005	<0.005	<0.005	<0.005
Lindane	mg/ℓ	<0.04	<0.04	<0.04	<0.04	<0.04
Methoxychlor	mg/ℓ	<0.10	<0.10	<0.10	<0.10	<0.10
Toxaphene	mg/ℓ	<0.05	<0.05	<0.05	<0.05	<0.05
2,4-D	mg/ℓ	<0.50	<0.50	<0.50	<0.50	<0.5
2,4,5-TP (Silvex)	mg/ℓ	<0.05	<0.05	<0.05	<0.05	<0.05

See footnotes at end of table.

TABLE 5.6-4
(Continued)

PARAMETER	UNITS(a)	SAMPLE IDENTIFICATION 0013-2504-D-W	0014-2505-D-W	0016-2562-D-W	0017-2563-D-W
Endrin	mg/ℓ	<0.005	<0.005	<0.005/<0.005(b)	<0.005
Lindane	mg/ℓ	<0.04	<0.04	<0.04/<0.04(b)	<0.04
Methoxychlor	mg/ℓ	<0.10	<0.10	<0.10/<0.10(b)	<0.10
Toxaphene	mg/ℓ	<0.05	<0.05	<0.05/<0.05(b)	<0.5
2,4-D	mg/ℓ	<0.50	<0.50	<0.50	<0.50/<0.50
2,4,5-TP (Silvex)	mg/ℓ	<0.05	<0.05	<0.05	<0.05/<0.05

See footnotes at end of table.

TABLE 5.6-4
(Continued)

PARAMETER	UNITS(a)	SAMPLE IDENTIFICATION 0018-2564-D-W	0026-2662-D-W	0027-2663-D-W	0028-2664-D-W
Endrin	mg/ℓ	<0.005	<0.005	<0.005	<0.005
Lindane	mg/ℓ	<0.04	<0.04	<0.04	<0.04
Methoxychlor	mg/ℓ	<0.10	<0.10	<0.10	<0.10
Toxaphene	mg/ℓ	<0.05	<0.05	<0.05	<0.05
2,4-D	mg/ℓ	<0.50	<0.50	<0.50	<0.50
2,4,5-TP (Silvex)	mg/ℓ	<0.05	<0.05	<0.05	<0.05

(a)mg/ℓ = milligrams per liter or parts per million on leachate.

(b)The indicated sample was analyzed in duplicate for the corresponding parameter.

TABLE 5.6-5

SUMMARY OF POLYCHLORINATED BIPHENYL ANALYSIS RESULTS
FOR 120 LISTER AVENUE DRUM SAMPLES

SAMPLE IDENTIFICATON	PCB CONCENTRATION(a) mg/kg(b)	% RECOVERY	SOURCE AROCLOR(c)
0001-2423-D-P	<1.0/<1.0(h,d)	107%(f)	1242(g)
0003-2425-D-P	<1.0	(e)	(c)
0004-2426-D-P	<1.0	(e)	(c)
0006-2428-D-P	<1.0/<1.0	87.9%(f)	1242(g)
0007-2429-D-P	<1.0	(e)	(c)
0008-2430-D-P	<1.0	(e)	(c)
0009-2431-D-P	<1.0	(e)	(c)
0010-2432-D-P	<1.0	(e)	(c)
0011-2433-D-P	<1.0	(e)	(c)
0012-2434-D-P	<1.0	(e)	(c)
0013-2504-D-W	<1.0	(e)	(c)
0014-2505-D-W	<1.0	(e)	(c)
0016-2562-D-W	<1.0	85.0%(f)	1260(g)
0017-2563-D-W	<1.0	(e)	(c)
0018-2564-D-W	<1.0	(e)	(c)
0026-2662-D-W	15/14(h)	(e)	1248
0027-2663-D-W	7.3	(e)	1248
0028-2664-D-W	<1.0	(e)	(c)

(a)Method blanks were consistently <1.0 mg/kg polychlorinated biphenyl.

(b)Reported values were not corrected for percent recovery, mg/kg = milligrams per kilogram or parts per million.

(c)Indicates when PCBs are detected, the source of the PCB contamination and the commercial aroclor mixture used for quantitation. All samples were screened for Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260 to determine whether PCBs were present and which aroclor standards were required for instrument calibration.

(d)The indicated value represents the detection limit for polychlorinated biphenyls that is obtained in the IT Analytical Services Laboratory and coincides with the required detection limit referenced in the EPA analytical procedure SWA 846-8080.

(e)Percent recovery not run on the indicated sample.

(f)Value represents the percent recovery for spiking with Aroclor 1260.

(g)Sample spiked with Aroclor 1260 for percent recovery.

(h)Replicate extractions and analyses were performed on the indicated sample as part of the laboratory Quality Control program.

TABLE 5.7.1-1

ANALYTICAL RESULTS: 120 LISTER AVENUE SURFACE WATER

SAMPLE NO.	COLLECTION DATE	ANALYTICAL PARAMETER	RESULT
9000-2514-H-X	2/18/85	2,3,7,8-TCDD	0.013 ppb
		COD	123. mg/L (ppm)
		TSS	228. mg/L (ppm)
		TOC	31. mg/L (ppm)
9100-2733-H-X	3/27/85	2,3,7,8-TCDD	ND (0.0019 ppb)
		BOD5	17.mg/L (ppm)
		TSS	52. mg/L (ppm)
		TOC	30. mg/L (ppm)

TABLE 5.7.2-1

2,3,7,8-TCDD RESULTS: 120 LISTER AVENUE SAMPLES COLLECTED IN FALL 1984

SAMPLE NO.	TYPE	DESCRIPTION	COLLECTION DATE	RESULTS
S005-0906-W-L	Wipe	WT11, Chemical Truck Wipe	9-27-84	ND (2.4 ng/m^2)
S006-0907-W-L	Wipe	WS12, Equipment Scrubber Stack	9-27-84	ND (.88 ng/m^2)
S001-0890-C-L	Chip	CF7-Floor	9-25-84	1.25 ppb
S002-0892-C-L	Chip	CW8-North Wall	9-25-84	0.31 ppb
S003-0893-C-L	Chip	CF9-Floor	9-25-84	5.1 ppb
S004-0894-C-L	Chip	CW10-West Wall	9-25-84	ND (0.78 ppb)
STB1-0870-100-S-L	Soil	Borehole No. 1, 0-6"	9-26-84	34.7 ppb
STB1-0871-101-S-L	Soil	Borehole No. 1, 6-12"	9-26-84	39.3 ppb
STB2-0878-100-S-L	Soil	Borehole No. 2, 0-6"	9-26-84	7.2 ppb
STB2-0879-101-S-L	Soil	Borehole No. 2, 6-12"	9-26-84	0.82 ppb
S-B-3-0942-100-S-L	Soil	Borehole No. 3, 0-6"	9-26-84	0.4 ppb
S-B-3-0973-101-S-L	Soil	Borehole No. 3, 6-12"	9-27-84	0.5 ppb
S-B-4-0943-100-S-L	Soil	Borehole No. 4, 0-6"	9-26-84	0.7 ppb
S-B-4-0984-101-S-L	Soil	Borehole No. 4, 6-12"	9-27-84	4.0 ppb
S-B-5-0944-100-S-L	Soil	Borehole No. 5, 0-6"	9-26-84	4.8 ppb
S-B-5-0991-101-S-L	Soil	Borehole No. 5, 6-12"	10-05-84	5.4 ppb
S-S-6-0971-100-S-L	Soil	Location SS6-Shallow Soil	9-26-84	1.7 ppb

TABLE 5.7.3-1

ANALYTICAL RESULTS: DECON WATER

SAMPLE NO.	COLLECTION DATE	ANALYTICAL PARAMETER	RESULT
9100-2596-H-X	3/1/85	Dioxin	0.0022 ppb
		BOD_5	324. mg/L (ppm)
		TSS	19 mg/L (ppm)
		TOC	154. mg/L (ppm)

TABLE 5.8-1

QUALITY ASSURANCE OBJECTIVES

ANALYSIS	MATRIX	METHOD PRECISION (% Rel. Std. Dev.)	METHOD ACCURACY (% Recovery)
2,3,7,8-TCDD	Water	±25	50-120
	Soil	±25	50-120
	Air/Ind.Hyg.	±25	50-120
	Surface Wipes	±25	50-120
Volatile Priority Pollutants	Water	±7-22(a)	75-120(a)
	Soil	±7-22(a)	60-130(a)
Semi-volatile Priority Pollutants	Water	±6-70(a)	40-180(a)
	Soil	±6-70(a)	40-180(a)
Priority Pollutant Metals	Water	±10(a)	70-100(a)
	Soil	±15(a)	70-100(a)
Cyanides	Water	±10	85
	Soil	±15	80
Total Phenols	Water	±1	75-100
	Soil	±5	75-100

(a)The accuracy and precision are compound dependent.

NOTES: The Quality Assurance Objective for completeness is 90 percent for all of the above analyses.

The Method Precision and Method Accuracy reported for each analysis were generated by the EPA under ideal conditions. The precision and accuracy that can be achieved are frequently determined by the level of interferences present rather than instrumental or method limitations.

TABLE 5.8.1-1

FIELD BLANK COLLECTION SUMMARY

MATRIX	NUMBER SAMPLES COLLECTED	ANALYSIS PARAMETERS (SAMPLES)	NUMBER BLANKS COLLECTED	ANALYSIS PARAMETERS (BLANKS)	PERCENT FREQUENCY (BLANKS TO SAMPLES)
Solid	93	Full PP(a) (42)	7	VOA	7.5
		or			
		2,3,7,8-TCDD only (51)	1	2,3,7,8-TCDD	1.1
Water	5	Full PP(a)	2	Full PP(a)	40
Wipes	23	2,3,7,8-TCDD	6	2,3,7,8-TCDD	26
Chips	18	2,3,7,8-TCDD	1	2,3,7,8-TCDD	5.5

(a)PP indicates priority pollutants which includes 2,3,7,8-TCDD.

TABLE 5.8.2.2-1

2,3,7,8-TCDD LABORATORY DUPLICATE RESULTS SUMMARY

SAMPLE TYPE	ORIGINAL RESULT (ppb)	DUPLICATE RESULT (ppb)
Soil	ND (0.07)	ND (0.30)
Chip	0.48	0.36
Chip	0.67	ND (0.16)
Soil	0.23	ND (0.30)
Soil	ND (1.5)	2.7

TABLE 5.8.2.2-2

2,3,7,8-TCDD LABORATORY MATRIX SPIKE RECOVERY RESULTS

SAMPLE TYPE	ORIGINAL RESULT (ppb)	+	AMOUNT SPIKED (ppb)	=	THEORET. CONC. SAMPLE + SPIKE (ppb)	SPIKE RESULT (ppb)	PERCENT RECOVERY
Soil	ND		17.0		17.0	16.6	98
Chip	0.48		17.0		17.5	17.0	97
Chip	0.67		17.0		17.7	16.6	94
Soil	0.23		17.0		17.2	18.1	105
Soil	ND		17.0		17.0	17.8	105

TABLE 5.8.3-1

NJDEP - DESIGNATED SPLIT SAMPLES
120 LISTER AVENUE

IT SAMPLE NO.	SAMPLE TYPE	ITAS REQUIRED ANALYSES	NJDEP SPLIT SAMPLE NUMBER
D-11-G-2344-101-S-L	Soil	2,3,7,8-TCDD	Cal Analytical Bottle No. 6-D
G-11-D-2111-100-S-L	Soil	2,3,7,8-TCDD	Cal Analytical Bottle No. 2-D
G-11-D-2112-101-S-L	Soil	2,3,7,8-TCDD	Cal Analytical Bottle No. 3-D
E-10-L-2376-100-S-L	Soil	2,3,7,8-TCDD	Cal Analytical Bottle No. 8-D
F-9-G-2599-298-H-Y	Ground Water	All PP parameters	Cal Analytical Bottle Nos.: C-1, P-1, M-1, A-1, A-2, V-5, V-6

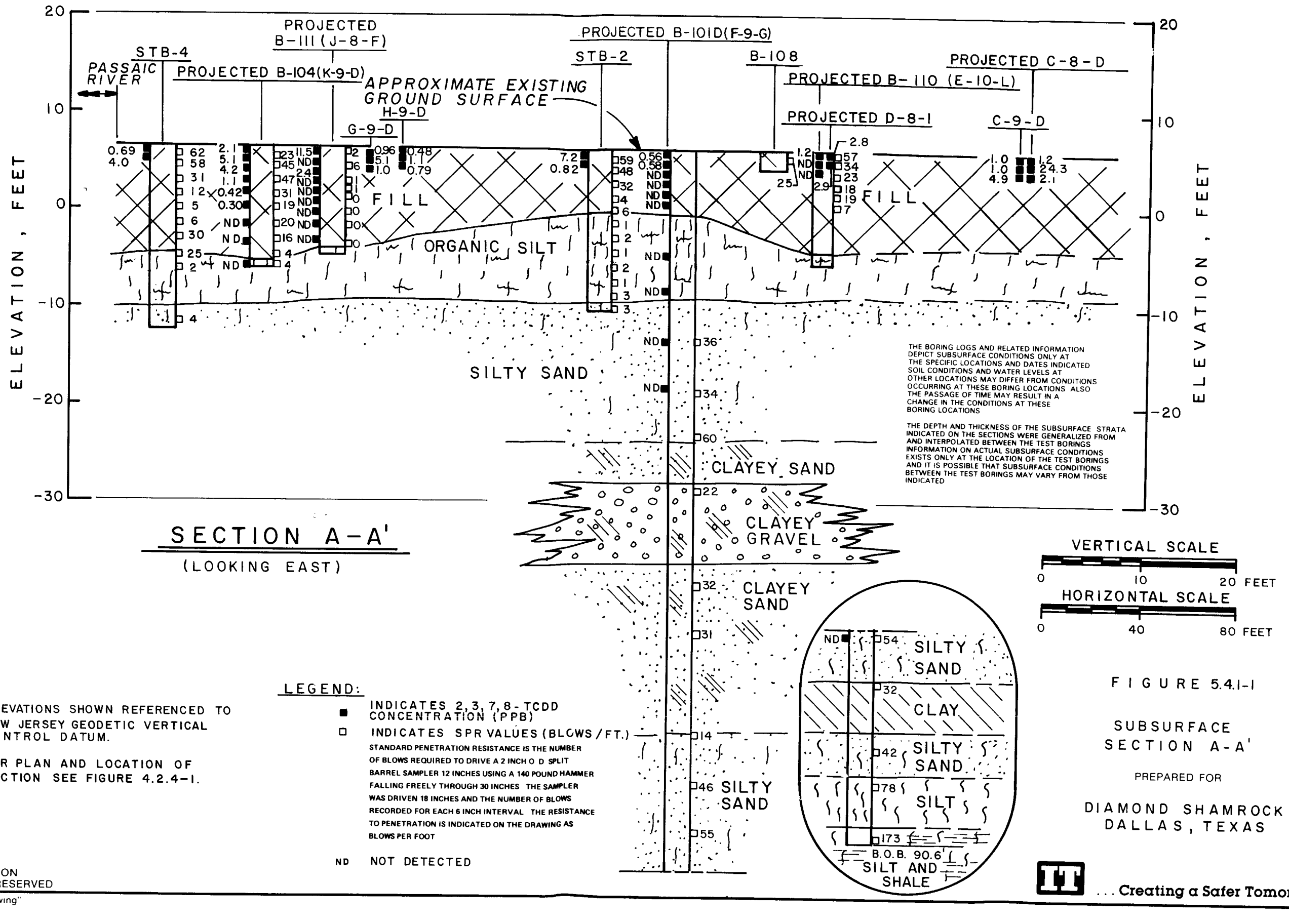
TABLE 5.8.3-2

NJDEP PROFICIENCY SAMPLE RESULTS
2,3,7,8-TCDD

IT SAMPLE NO.	DESCRIPTION	RESULT (ppb)
X9709-2270-P-F-L	NJDEP No. X9709	10.3
3Y604-2386-P-F-L	NJDEP No. 3Y604	4.2
4V102-2499-P-F-L	NJDEP No. 4V102	5.4
J3910-2500-P-F-L	NJDEP NO. J3910	9.9
D2917-2529-P-F-L	NJDEP No. D2917	ND (0.05)
L7411-2530-P-F-L	NJDEP No. L7411	10.0
7X306-2665-P-F-L	NJDEP No. 7X306	4.2
2K807-2670-P-F-L	NJDEP No. 2K807	9.2

FIGURES

DRAWN BY	J. LOGREGO	4-22-85	
CHECKED BY	MD	5-1-85	DRAWING NUMBER 846722-B13
APPROVED BY	DHE	5-1-85	



SECTION A-A'

(LOOKING EAST)

THE BORING LOGS AND RELATED INFORMATION DEPICT SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED SOIL CONDITIONS AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THESE BORING LOCATIONS ALSO THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THESE BORING LOCATIONS

THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTIONS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN THE TEST BORINGS INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE TEST BORINGS AND IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED

VERTICAL SCALE
0 10 20 FEET
HORIZONTAL SCALE
0 40 80 FEET

NOTES:

1. ELEVATIONS SHOWN REFERENCED TO NEW JERSEY GEODETIC VERTICAL CONTROL DATUM.
2. FOR PLAN AND LOCATION OF SECTION SEE FIGURE 4.2.4-1.

LEGEND:

- ■ INDICATES 2,3,7,8-TCDD CONCENTRATION (PPB)
- □ INDICATES SPR VALUES (BLOWS/FT.)

STANDARD PENETRATION RESISTANCE IS THE NUMBER OF BLOWS REQUIRED TO DRIVE A 2 INCH O D SPLIT BARREL SAMPLER 12 INCHES USING A 140 POUND HAMMER FALLING FREELY THROUGH 30 INCHES THE SAMPLER WAS DRIVEN 18 INCHES AND THE NUMBER OF BLOWS RECORDED FOR EACH 6 INCH INTERVAL THE RESISTANCE TO PENETRATION IS INDICATED ON THE DRAWING AS BLOWS PER FOOT

ND NOT DETECTED

FIGURE 5.4.1-1

SUBSURFACE SECTION A-A'

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DRAWN BY D. Weick 4-23-85
CHECKED BY MD 5-1-85
APPROVED BY DHE 5-1-85
DRAWING NUMBER 846722-B6

PASSAIC RIVER
APPROXIMATE EXISTING GROUND SURFACE
STB-3
B-107 (E-11-P)
PROJECTED B-109 (E-11-N)
PROJECTED STB-1
K-10-D
G-10-D
F-10-D
E-10-D
D-10-D
C-10-D

FILL
ORGANIC SILT
SAND
SILTY SAND
GRAVEL
SILT
SILTY SAND
SILT AND SAND
SILT
SILTY SAND
ORGANIC SILT
FILL

BOB 81.5

ELEVATION, FEET
20
10
0
-10
-20
-30
-40
-50
-60
-70

SECTION B-B'
(LOOKING EAST)

LEGEND:

■ INDICATES 2,3,7,8-TCDD CONCENTRATION

□ INDICATES SPR VALUES (BLOWS/FT.)
STANDARD PENETRATION RESISTANCE IS THE NUMBER OF BLOWS REQUIRED TO DRIVE A 2 INCH O D SPLIT BARREL SAMPLER 12 INCHES USING A 140 POUND HAMMER FALLING FREELY THROUGH 30 INCHES THE SAMPLER WAS DRIVEN 18 INCHES AND THE NUMBER OF BLOWS RECORDED FOR EACH 6 INCH INTERVAL THE RESISTANCE TO PENETRATION IS INDICATED ON THE DRAWING AS BLOWS PER FOOT

ND NOT DETECTED

NOTES:

1. ALL ELEVATIONS REFERENCED TO NEW JERSEY GEODETIC VERTICAL CONTROL DATUM
2. FOR PLAN AND LOCATION OF SECTION SEE FIGURE 4.2.4-1

THE BORING LOGS AND RELATED INFORMATION DEPICT SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED SOIL CONDITIONS AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THESE BORING LOCATIONS ALSO THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THESE BORING LOCATIONS

THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTIONS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN THE TEST BORINGS INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE TEST BORINGS AND IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED

HORIZONTAL SCALE
0 40 80 FEET

VERTICAL SCALE
0 10 20 FEET

FIGURE 5.4.1-2

SUBSURFACE SECTION B-B'

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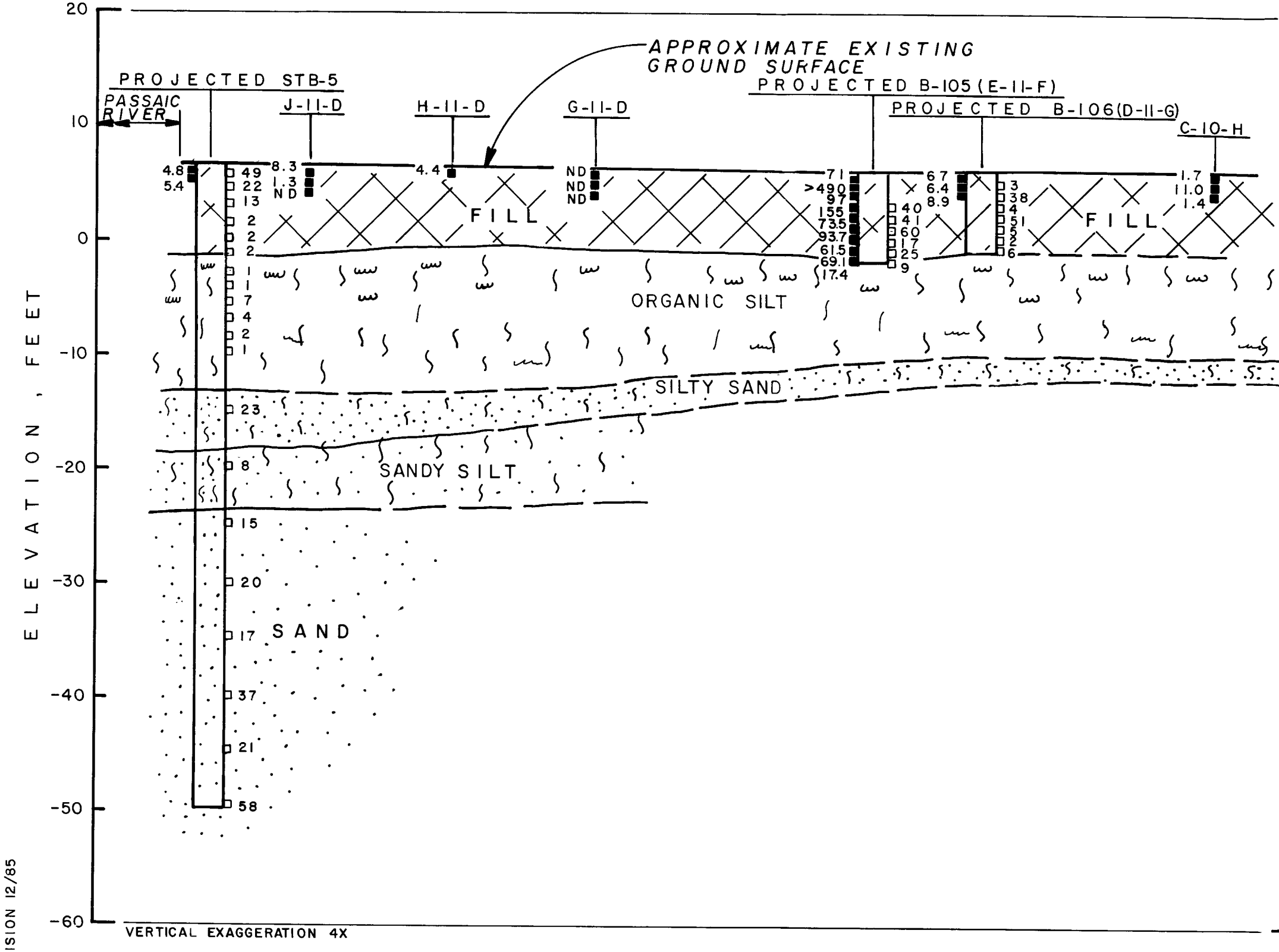
DRAWN BY J.LOBRECO 4-23-85 | CHECKED BY ND | APPROVED BY DHE | 5-1-85 | 5-1-85 | DRAWING NUMBER 846722-B11



LEGEND:

■ INDICATES 2,3,7,8-TCDD CONCENTRATION (PPB)

□ INDICATES SPR VALUES (BLOWS / FT.)

STANDARD PENETRATION RESISTANCE IS THE NUMBER OF BLOWS REQUIRED TO DRIVE A 2 INCH O D SPLIT BARREL SAMPLER 12 INCHES USING A 140 POUND HAMMER FALLING FREELY THROUGH 30 INCHES. THE SAMPLER WAS DRIVEN 18 INCHES AND THE NUMBER OF BLOWS RECORDED FOR EACH 6 INCH INTERVAL THE RESISTANCE TO PENETRATION IS INDICATED ON THE DRAWING AS BLOWS PER FOOT

ND NOT DETECTED

NOTES:

1. ALL ELEVATIONS REFERENCED TO NEW JERSEY GEODETIC VERTICAL CONTROL DATUM
2. FOR PLAN AND LOCATION OF SECTION SEE FIGURE 4.2.4-1.

THE BORING LOGS AND RELATED INFORMATION DEPICT SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED SOIL CONDITIONS AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THESE BORING LOCATIONS ALSO THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THESE BORING LOCATIONS

THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTIONS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN THE TEST BORINGS INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE TEST BORINGS AND IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED

FIGURE 5.4.1-3

SUBSURFACE SECTION C-C'

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DALLAS, TEXAS

SECTION C-C'

(LOOKING EAST)

VERTICAL SCALE 0 10 20 FEET

HORIZONTAL SCALE 0 40 80 FEET

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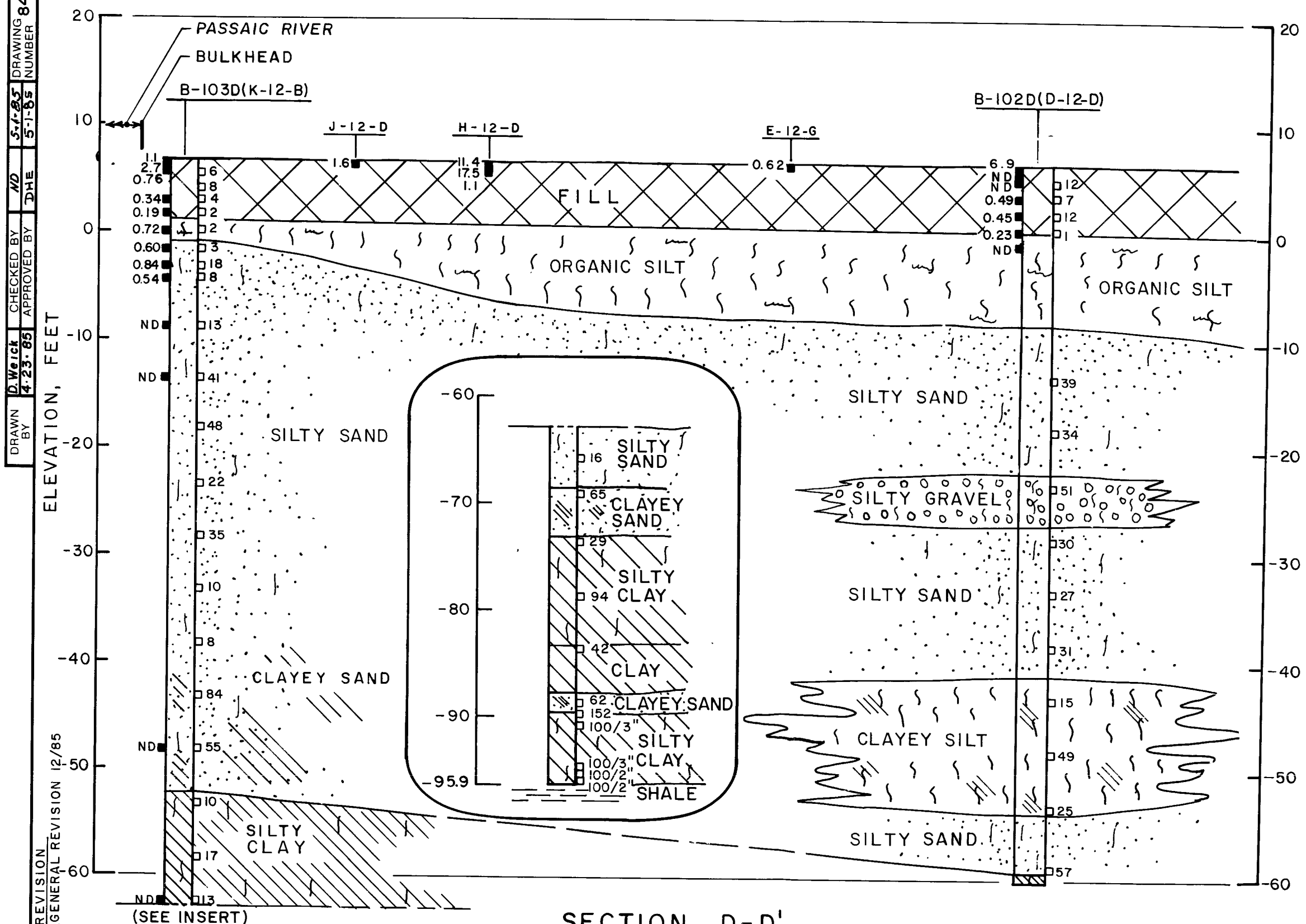
DRAWN BY	D. Welch 4.23.85	CHECKED BY	ND 5.1.85	DRAWING NUMBER	846722-B12
		APPROVED BY	DHE 5.1.85		



SECTION D-D'

(LOOKING EAST)

LEGEND:

■ INDICATES 2,3,7,8,-TCDD CONCENTRATION (PPB)

□ INDICATES SPR VALUES (BLOWS/FT.)

STANDARD PENETRATION RESISTANCE IS THE NUMBER OF BLOWS REQUIRED TO DRIVE A 2 INCH O.D SPLIT BARREL SAMPLER 12 INCHES USING A 140 POUND HAMMER FALLING FREELY THROUGH 30 INCHES. THE SAMPLER WAS DRIVEN 18 INCHES AND THE NUMBER OF BLOWS RECORDED FOR EACH 6 INCH INTERVAL THE RESISTANCE TO PENETRATION IS INDICATED ON THE DRAWING AS BLOWS PER FOOT

ND NOT DETECTED

NOTES:

1. ELEVATIONS SHOWN REFERENCED TO NEW JERSEY GEODETIC VERTICAL CONTROL DATUM.
2. FOR PLAN AND LOCATION OF SECTION SEE FIGURE 4.2.4-1.

THE BORING LOGS AND RELATED INFORMATION DEPICT SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED SOIL CONDITIONS AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THESE BORING LOCATIONS ALSO THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THESE BORING LOCATIONS

THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTIONS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN THE TEST BORINGS INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE TEST BORINGS AND IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED

VERTICAL SCALE
0 10 20 FEET

HORIZONTAL SCALE
0 40 80 FEET

FIGURE 5.4.1-4

SUBSURFACE SECTION D-D'

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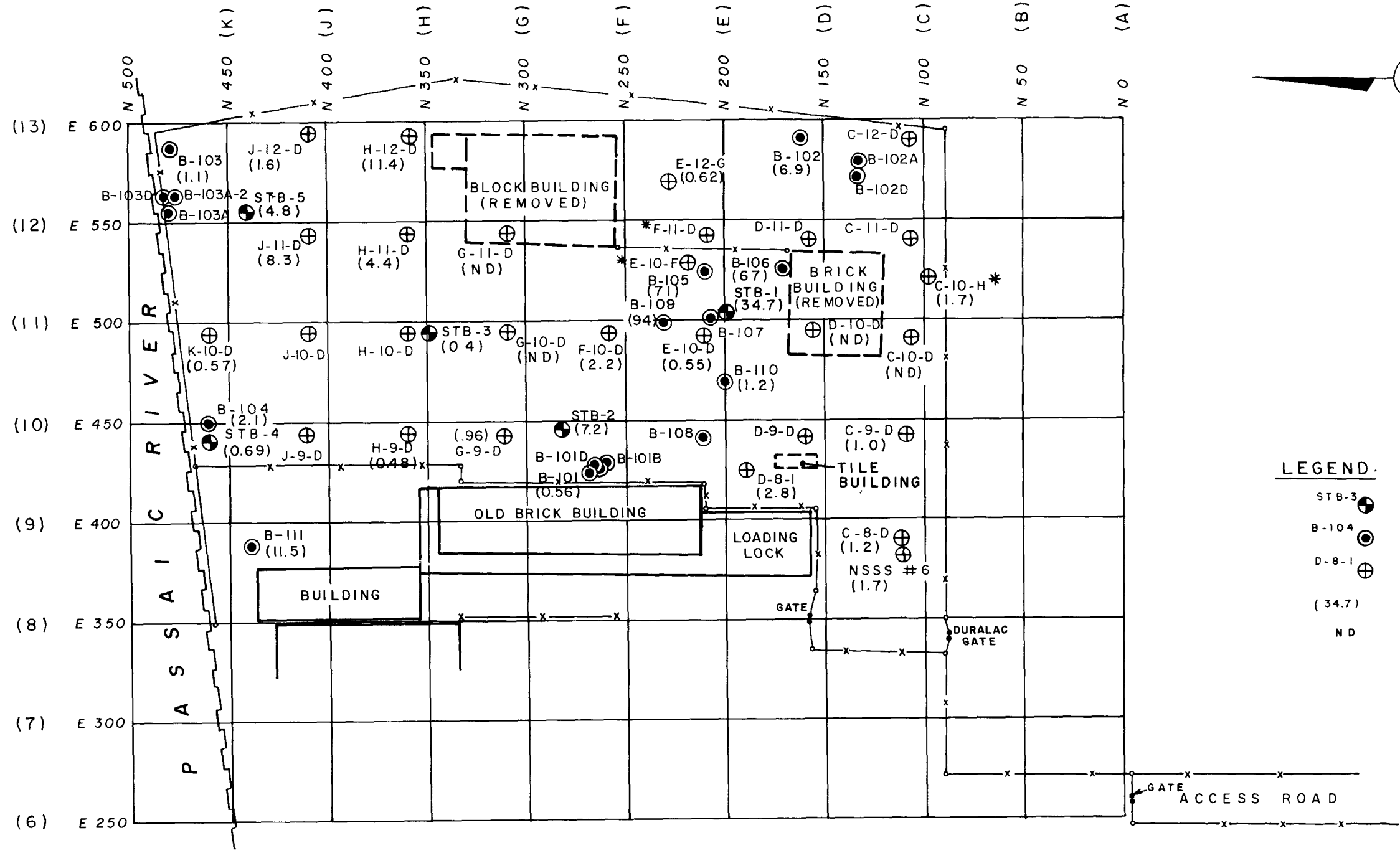
DRAWING NUMBER	846722-B7
CHECKED BY	ND
APPROVED BY	DME
DRAWN BY	J. LOBRECO
	4-23-85
LOD # ORG. #	



LEGEND.

- STB-3 ⊕ DEEP BORING LOCATION AND NUMBER
- B-104 ◉ BORING LOCATION AND NUMBER
- D-8-1 ⊕ NEAR SURFACE SOIL SAMPLE AND NUMBER.
- (34.7) INDICATES CONCENTRATIONS (ppb)
- ND NOT DETECTED

SCALE
0 60 120 FEET

NOTE.

* SAMPLE OR BORINGS WHICH HAVE BEEN RELOCATED ARE PLOTTED BY NORTH AND EAST COORDINATES ONLY. LETTER COORDINATES MAY NOT MATCH GRID.

FIGURE 5.4.2.1-1

2,3,7,8 – TCDD CONCENTRATIONS IN SOILS 0-TO 6-INCH DEPTH INTERVAL

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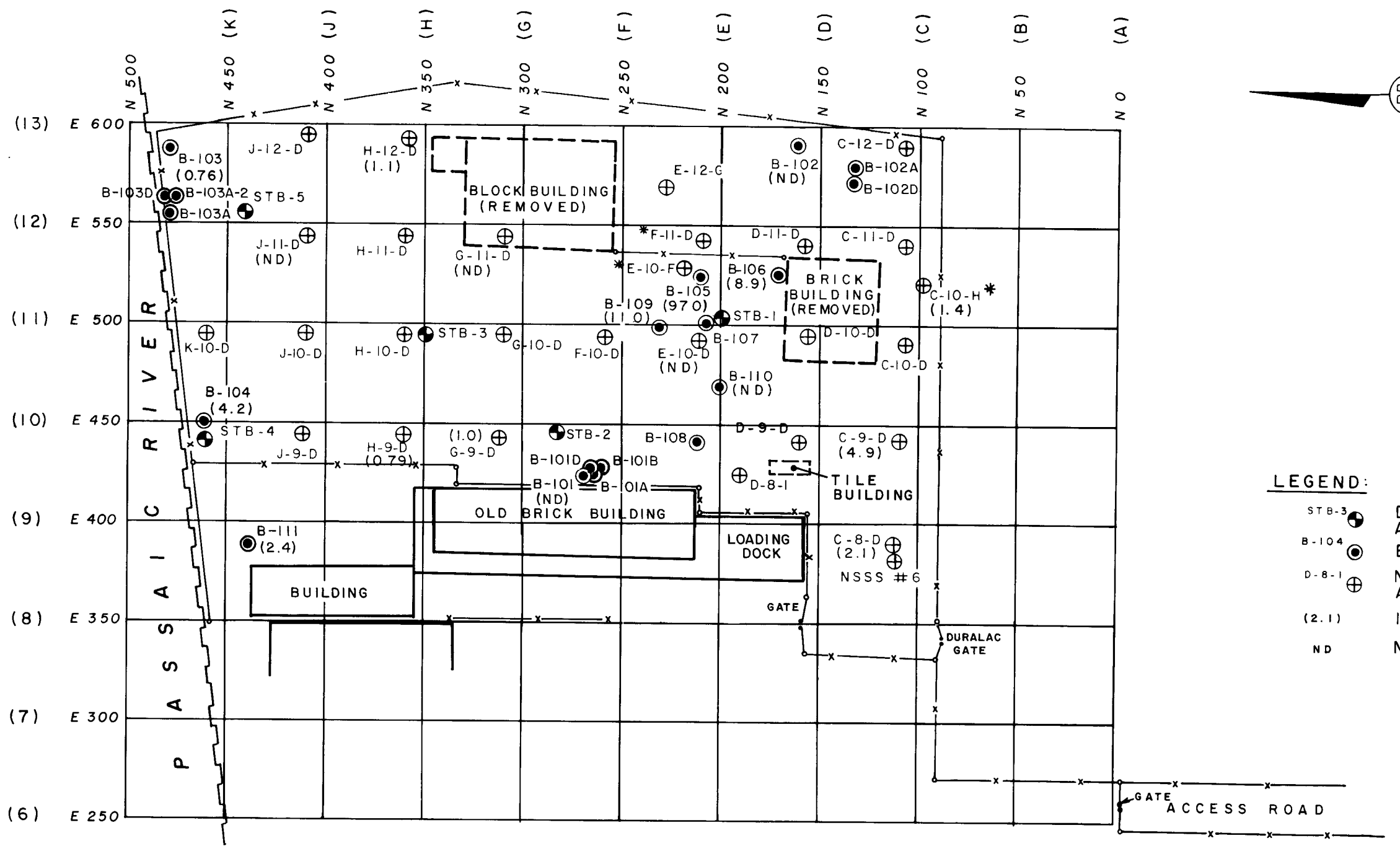
DRAWING NUMBER	846722-B9
CHECKED BY	ND
APPROVED BY	DHE
	5-1-85
	5-1-85
DRAWN BY	J. LOGRECO
	4-25-85
6	6
100 ORG.	



LEGEND:

- STB-3 — DEEP BORING LOCATION AND NUMBER
- B-104 — BORING LOCATION AND NUMBER
- D-8-1 — NEAR SURFACE SOIL SAMPLE AND NUMBER.
- (2.1) — INDICATES CONCENTRATIONS (ppb)
- ND — NOT DETECTED

SCALE
0 60 120 FEET

NOTE.

* SAMPLE OR BORINGS WHICH HAVE BEEN RELOCATED ARE PLOTTED BY NORTH AND EAST COORDINATES ONLY. LETTER COORDINATES MAY NOT MATCH GRID.

FIGURE 5.4.2.1-3

2, 3, 7, 8 - TCDD CONCENTRATIONS IN SOILS 12-TO 24-INCH DEPTH INTERVAL

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6.0

6.0 SITE PREPARATION ACTIVITIES FOR CONTAINER STORAGE

6.1 EQUIPMENT DECON AND REMOVAL

Each vehicle, tanker, or piece of equipment from the unpaved portion of the site was decontaminated before removal from the site. The equipment stored at the northern part of the site included two fiberglass vessels, three sections of fibercast pipe, three tank trailers, one box trailer filled with truck parts, three small box trailers, two large steel vessels, one small steel vessel, two pressure vessels, and other smaller miscellaneous equipment.

This equipment was wipe cleaned and sampled according to the procedures specified in the Work Plan (Appendix H). The decon procedure is described below.

Before the wipe samples were taken, all equipment was vacuumed using a vacuum equipped with a HEPA filter. Following vacuuming, the equipment was washed with high-pressure water. Collected dust was stored in containers. Water was retained in tanks on 80 Lister Avenue.

After cleaning, the equipment was wipe sampled. The results of these samples indicated that the surface contamination was <130 ng/m^2 and the equipment was returned to the owner with the Department's approval.

Three small box trailers which were deemed impractical to decontaminate, were crushed and placed in containers and stored on site. One box trailer and two scrap automobiles have been moved to the 80 Lister Avenue site.

The truck parts contained in one of the box trailers were washed and a representative portion of the parts were wipe sampled at the direction of the Department. All of this equipment was found to be "clean" (<130 ng/m^2) and was returned to the owner.

The equipment stored on the paved portion of the site was sampled in accordance with the work plan (Appendix H), found to be clean and returned to the owner.

6.2 BUILDING DEMOLITION

Three buildings existed on the 120 Lister Avenue site at the start of the investigation. These have been referred to as the brick building, block building, and tile building. Chip sampling and analytical testing for dioxin showed all three structures to be below the acceptable contaminant level of 7.0 ppb (Section 5.3.1).

Following verification of contaminant levels, all three were demolished in order to prepare the site for container storage. Each roof and its framing was removed and placed on the 80 Lister Avenue site for future disposal. The brick, block, and tile structure from each building was dismantled, crushed, and used as part of the fill for the container storage pad. The concrete floors in the buildings were left intact, and will be integrated into the container pad area.

6.3 EXCAVATIONS

Analysis of site soils indicated six areas of high dioxin contamination (>7.0 ppb) on the 120 Lister Avenue site. Additional analysis of archived soils allowed the areas to be pinpointed; at the direction of the NJDEP OSC, the specific areas requiring remediation were defined as illustrated in Figure 4.2.4.3-1; required excavation depths for each area were defined by the dioxin results for the samples below grade. The following remediation and testing was performed for each "hot spot" area, in an attempt to remove the contamination:

- Excavation No. 1 - Six to nine inches of soil was removed and containerized. Postremedial sampling and analysis indicated the area was now clear; the excavation was, therefore, backfilled with clean material.

- Excavation No. 2 - Twelve to fifteen inches of soil was removed and containerized; subsequent sampling and analysis showed remaining contamination at >7.0 ppb. An additional six inches of soil was removed and containerized. Sampling and analysis after the second excavation showed no remaining contamination above acceptable levels; the area was covered with sheets of 6-mil PVC and backfilled with clean material.

- Excavation No. 3 - Twelve to fifteen inches of soil was removed and containerized. Due to time constraints,

the area was covered with 6-mil PVC and backfilled with clean material prior to receipt of the postremedial sample analysis results. When available, the sample result did indicate the area to be within acceptable limits.

- Excavation No. 4 - Twelve inches of soil were removed and containerized. Postremedial sampling revealed the area was still contaminated in excess of the acceptable clean limit. Due to time constraints in site preparation for container storage and per the direction of the NJDEP OSC, the area was covered with 6-mil PVC and backfilled with clean material. No further testing was performed; the area will be addressed as part of the 80 Lister Avenue feasibility study.

- Excavation No. 5 - Twelve inches of soil were removed and containerized. Postremedial sampling showed dioxin levels remained in excess of the 7.0 ppb acceptable limit. No further excavation or sampling was done per the NJDEP OSC. The area was covered with 6-mil PVC and backfilled with clean material. The area will be addressed in the 80 Lister Avenue feasibility study.

- Excavation No. 6 - Twenty-four inches of soil were removed and containerized. No postremedial sampling or analysis was performed, per the NJDEP OSC. The area was covered with 6-mil PVC and backfilled with clean material. The area will be addressed in the 80 Lister Avenue feasibility study.

All postremedial samples consisted of composites of five surface samples collected from the corners and center of each area. Dioxin analysis results were presented in Section 5.4.2.3.

6.4 CONTAINER PAD PREPARATION

After the "hot spot" areas were excavated and backfilled, as discussed in Section 6.3, an access road over Hot Spot Areas 4 and 5 was constructed. The road over these areas consisted of a layer of ground underlain by 6-mil synthetic liner and geotextile. The road was extended along the west end of the 120 Lister property. This portion of the road consisted of gravel underlain by geotextile. Upon completion of the road, the liner system was installed over the site which consisted of:

- Geotextile
- Six-inch sand layer
- 30-mil HDPE liner

- Six-inch sand layer
- Eight-inch-thick gravel layer.

This was done in accordance with Figure 6.4-1 as approved by the Department with two exceptions. The originally proposed 8-inch stone layer was increased to 18 inches to facilitate loader movement on the site. In addition, inclinometers were installed to provide a means of monitoring soil movement after the site is loaded. The concrete slabs which were below demolished buildings remained on the site. The elevation of the slab, which was lower than the container pad's elevation, was brought up using sand. Both slab areas were then covered by 30-mil HDPE and anchored with concrete blocks.

Two drain systems have been installed. Internal collection ditch drains by gravity to the carbon bed and from there by another ditch to the river. The perimeter ditch swale discharges directly to the river. These two systems will provide for drainage from the immediate container area which will be covered and from outside the container area, respectively.

6.5 UNDERGROUND PIPING

The site and adjacent property were traversed by a system of 6- to 24-inch sewers and drains leading to the Passaic River and the PVSC. Efforts have been made to locate them and obtain the samples for dioxin analysis. The 24-inch sewer line, as shown in Figure 6.5-1, has never been found. In the location of 13-inch drain, a 6 or 8 inch pipe was found. The pipe was filled with water and plugged. In order to prevent the movement of water across the site, the abandoned drains where plugged with concrete. Additional samples of the river sediment near drain's outlet will be taken and analyzed for dioxin. All the outlets will be plugged with concrete to ensure that no water will be discharged to the river.

6.6 UTILITIES

Two additional electrical poles have been installed for rerouting the power to Hilton-Davis property so that existing power poles could be removed. Transformers were decontaminated and returned to PSE&G. Existing poles and wire will not be decontaminated but will remain on site for future remediation.

The water supply system has been shut off by the city of Newark as required by the demolition permit. No further work is expected on the water supply system.

6.7 FENCE

A fence along the property line of 80 Lister Avenue will be completed by May 15, 1985. The existing fence on the north, east, and south will remain, while the fence on the west side of the property will be moved to comply with new layout as shown in Figure 4.0.-1.

6.8 CONTAINER STORAGE

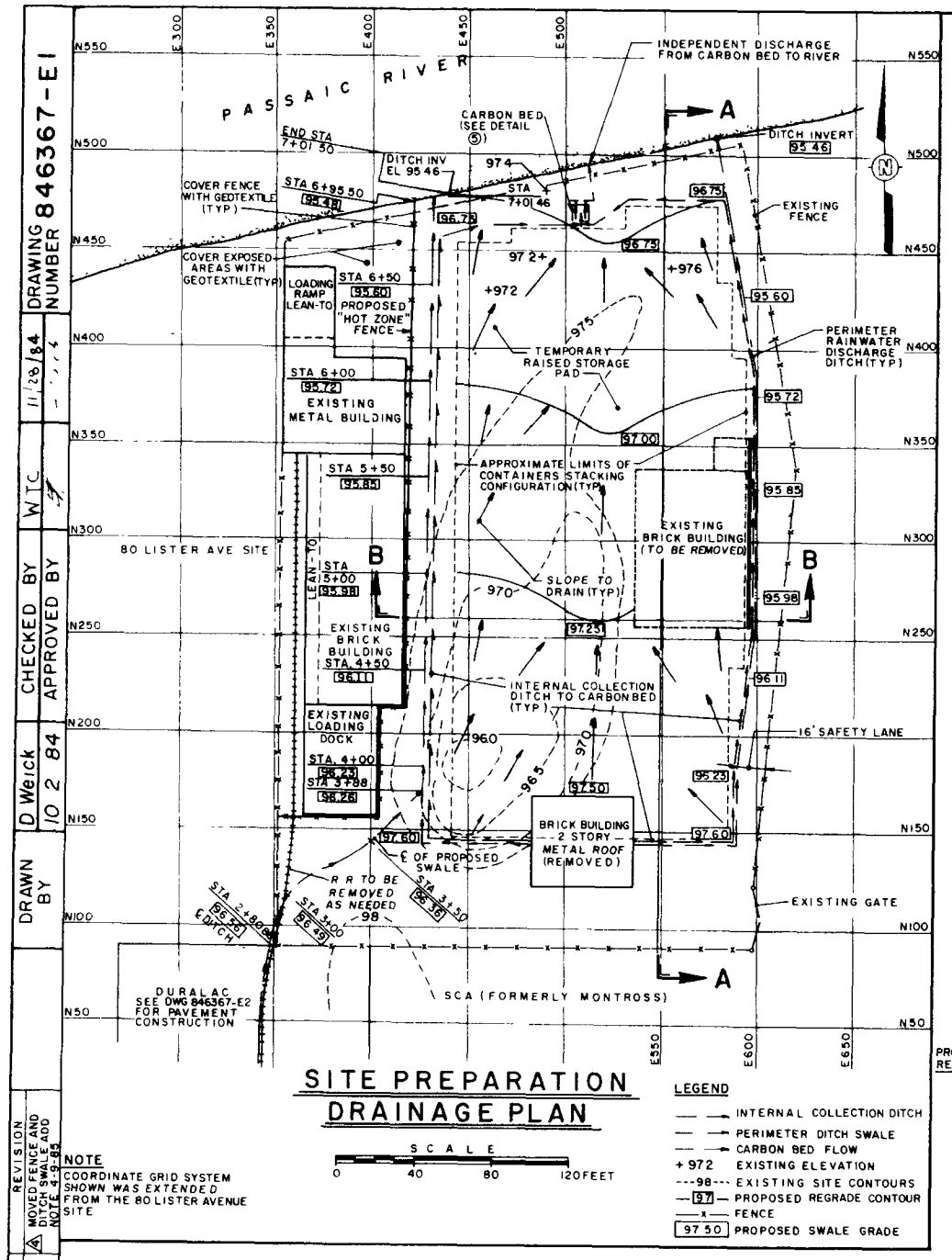
Containers of material from the site (crushed box trailers, soil, etc.) have been washed and moved to their storage area. Containers from the other off-site work included in ACO II started to be moved to the site on April 29. All off-site materials currently containerized will be moved to the site by May 15, 1985. Other off-site materials will be moved to the site as they are containerized.

FIGURES

DRAWING NUMBER 846367-E1

REVISION	BY	CHECKED BY	APPROVED BY
⚠ ADD EXISTING CONTOUR AND CHANGE LEGEND 11-28-84	D Weick		
⚠ GENERAL REVISION 2-6-85	10 2 84	W.T.C.	
⚠ REV PLAN-STAKING CONFIGURATION AND NOTES 3-20-85	DRAWN BY	11/28/84	
⚠ MOVED FENCE AND DITCH SWALE ADD NOTE 4-29-85		1" = 40'	

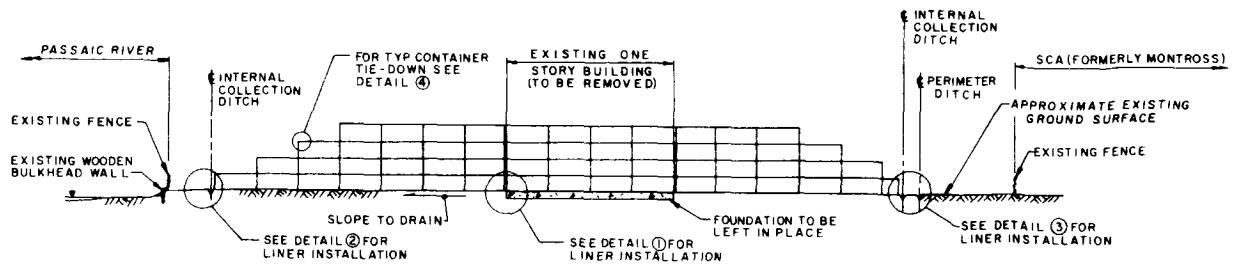
SITE PREPARATION DRAINAGE PLAN



NOTE
COORDINATE GRID SYSTEM SHOWN WAS EXTENDED FROM THE 80 LISTER AVENUE SITE

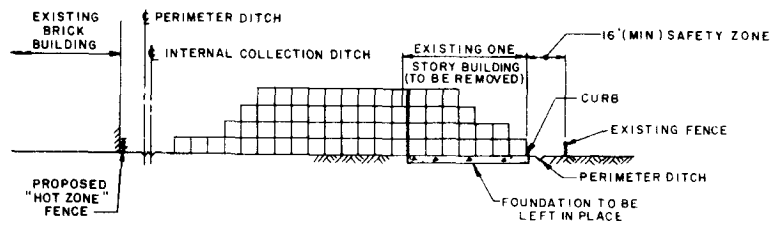
LEGEND
- INTERNAL COLLECTION DITCH
- PERIMETER DITCH SWALE
- CARBON BED FLOW
- +972 EXISTING ELEVATION
- 98 EXISTING SITE CONTOURS
- 97 PROPOSED REGRADE CONTOUR
- FENCE
- 97.50 PROPOSED SWALE GRADE

SCALE 0 40 80 120 FEET



SECTION A-A

SCALE 0 40 80 120 FEET



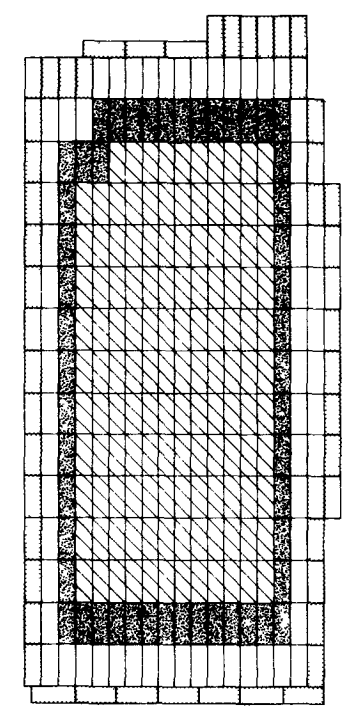
SECTION B-B

SCALE 0 40 80 120 FEET

LEGEND
- 1 LAYER (293)
- 2 LAYER (242)
- 3 LAYER (180)
- 4 LAYER (130)

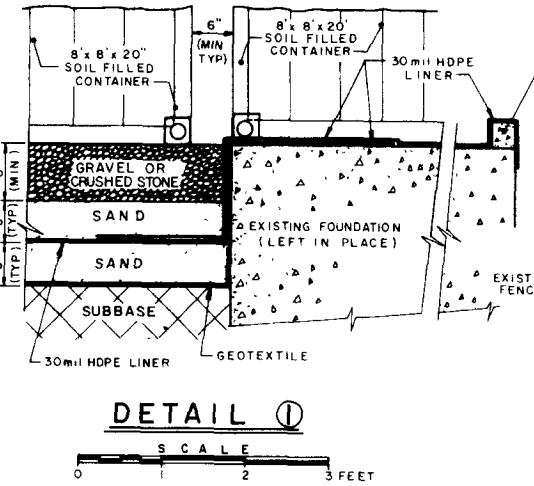
TOTAL 845 CONTAINERS

NOTE
1. SEE DRAINAGE PLAN FOR LIMITS OF STACKING
2. FOR EVERY 20 FEET SOUTH YOU CAN GAIN 60 MORE CONTAINER STORAGE
3. CONTAINER CONFIGURATION ALLOWS FOR 3" SPACING BETWEEN CONTAINERS



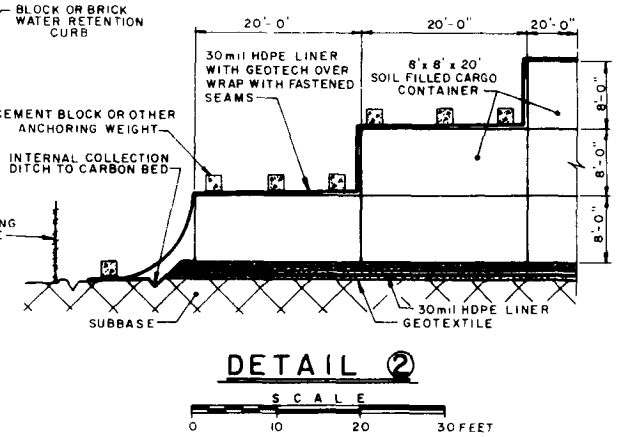
PLAN - STACKING CONFIGURATION FOR 845 CONTAINERS

SCALE 0 40 80 120 FEET



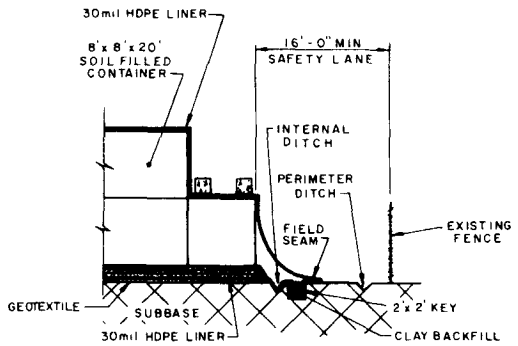
DETAIL 1

SCALE 0 1 2 3 FEET



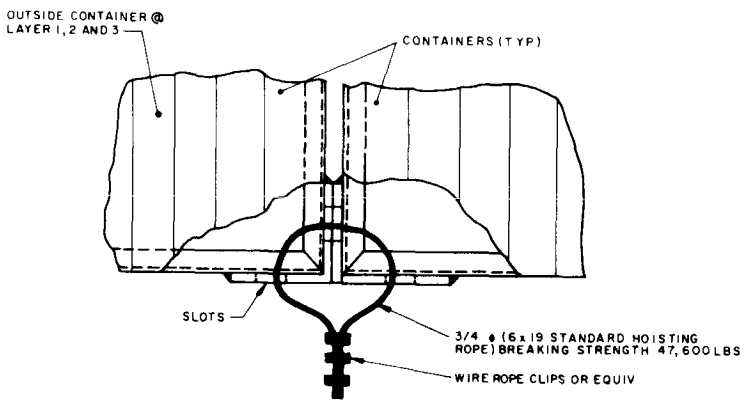
DETAIL 2

SCALE 0 10 20 30 FEET



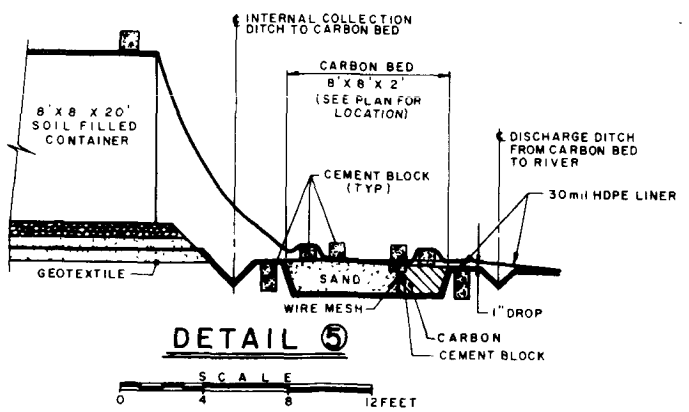
DETAIL 3

SCALE 0 10 20 30 FEET



DETAIL 4
TYP. TIE-DOWN ALL PERIMETER CONTAINERS

NTS



DETAIL 5

SCALE 0 4 8 12 FEET

NOTES
1. LINER MATERIALS, FIELD SEAMING, AND QUALITY CONTROL TO BE PROVIDED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS
2. SUBBASE TO BE WELL COMPACTED PRIOR TO PLACEMENT OF LINER
3. CONTAINER STACKING MUST BE CARRIED OUT IN MANNER WHICH ASSURES STABILITY OF STACK AT ALL TIMES

APPROVED BY NJDEP
R SENNA
1-10-85

FIGURE 6.4-1

PLAN, SECTIONS AND DETAILS TEMPORARY WASTE CONTAINER STORAGE

SERGEANT SITE
NEWARK, NEW JERSEY

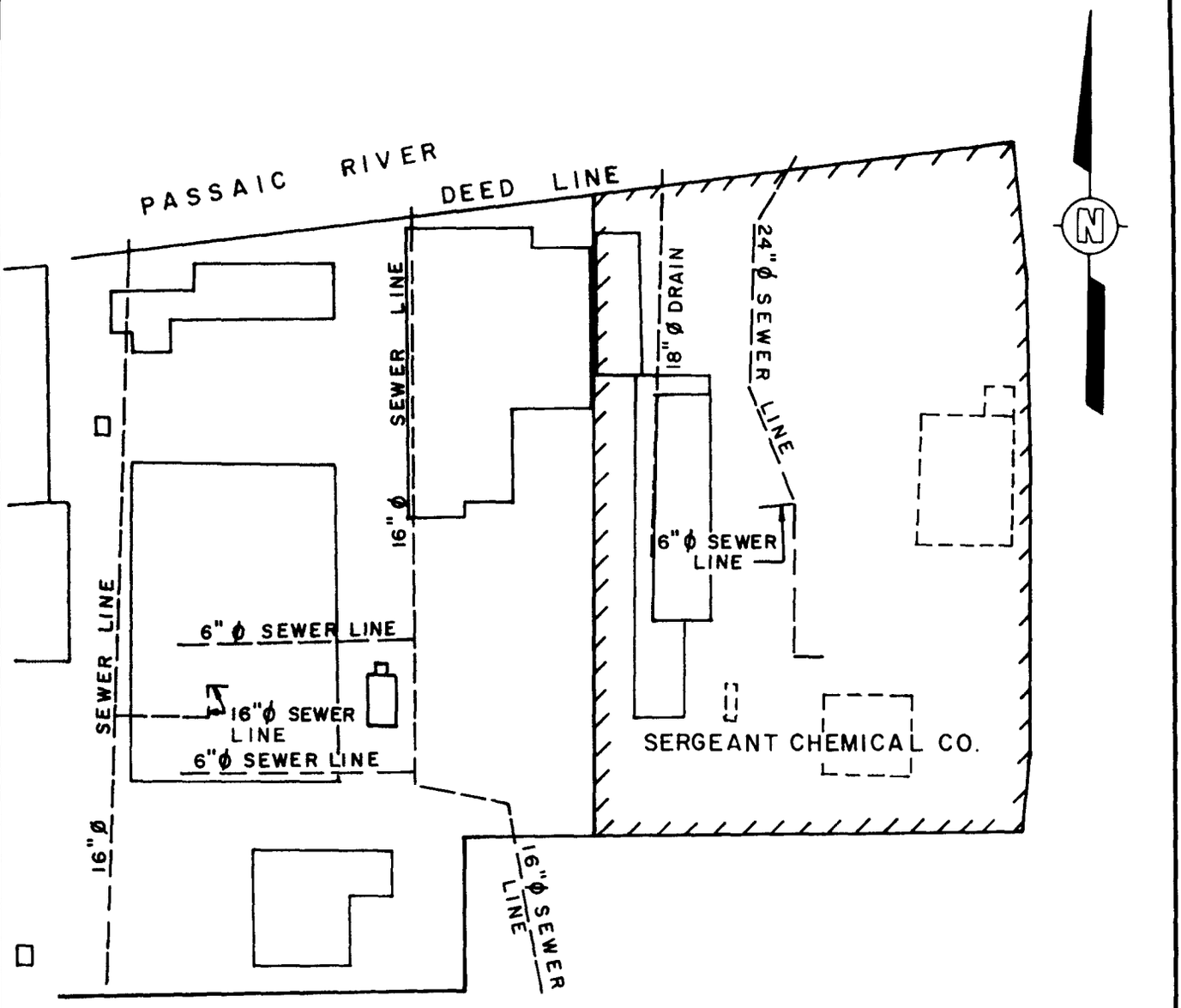
PREPARED FOR

DIAMOND SHAMROCK
DALLAS, TEXAS

IT CORPORATION

REV 4

DEP\DA0086373



SCALE
0 100 200 FEET

FIGURE 6.5-1

PRESUMED LOCATION OF ABANDONED SEWER LINES

PREPARED FOR

DIAMOND SHAMROCK
DALLAS, TEXAS

DRAWN BY	CHECKED BY	DRAWING NUMBER
DWeick 4-17-85	MD 5-1-85	846722-A22
	APPROVED BY	
	DHE 5-1-85	

REVISION:
GENERAL REVISION 12/85

IT ... Creating a Safer Tomorrow

65360

DEP\DA0086374