NEWARK BAY STUDY AREA

ADDITIONAL SITES AND CANDIDATE PRPS FOR THE NEWARK BAY STUDY AREA

VOLUME I OF II

PRP DATA EXTRACTION FORM AND EVIDENCE CONCERNING:

BAYONNE INDUSTRIES, INC
BAYONNE, NEW JERSEY SITE

PREPARED BY:
TIERRA SOLUTIONS, INC.

SUBMITTED TO:
USEPA REGION II

APRIL 2009

NEWARK BAY STUDY AREA
PRP DATA EXTRACTION FORM

Bayonne Industries, Inc., Bayonne, New Jersey Site

CANDIDATE PRP(S):

PRP: Bayonne Industries, Inc.
PRP: IMTT Holdings, Inc.
PRP: International Matex Tank Terminals
PRP: International Tank Bayonne, Inc.
PRP: International Tank Terminals, LLC
PRP: ITT-Storage, Inc.
PRP: ITT-Bayonne Storage, Inc.

CURRENT MAILING ADDRESS/CONTACT INFO FOR CANDIDATE PRP(S):

PRP: Bayonne Industries, Inc.
Thomas B. Coleman, President and CEO
321 St. Charles Avenue
New Orleans, LA 70130
CCB000002, CCB000004, CCB000006,

PRP: IMTT Holdings, Inc.
Thomas B. Coleman, President
321 St. Charles Avenue
New Orleans, LA 70130
CCB000011, CCB000012

PRP: International Matex Tank Terminals
(also for IMTT doing business as IMTT-Bayonne)
Thomas B. Coleman, General Partner
321 St. Charles Avenue
New Orleans, LA 70130
CCB000021

PRP: International Tank Bayonne, Inc.
James Coleman, President
321 St. Charles Avenue
New Orleans, LA 70130
CCB000007, CCB000011, CCB000012, CCB000014

PRP: International Tank Terminals, LLC
Darryl Daigs, Registered Agent
321 St. Charles Avenue
New Orleans, LA 70130
CCB000010

PRP: ITT-Storage, Inc.
Thomas B. Coleman, Director
321 St. Charles Avenue
New Orleans, LA 70130
CCB000009

PRP: ITT-Bayonne Storage, Inc.
Thomas B. Coleman, Director
321 St. Charles Avenue
New Orleans, LA 70130
CCB000016

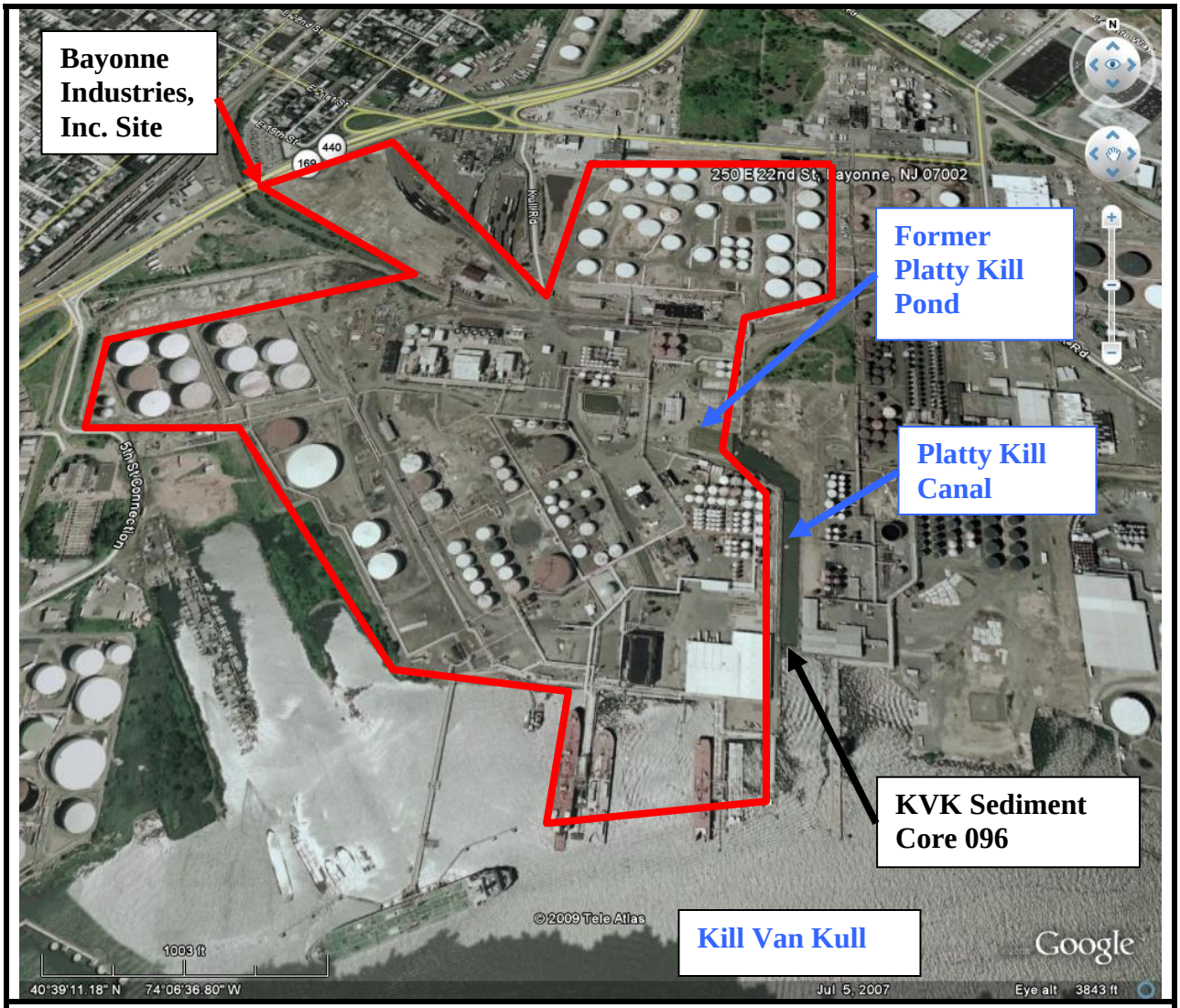
FACILITY ADDRESS:

The street address of the Bayonne Industries Inc. ("BII" or "Bayonne Industries") site (the "Site") is:

250 East 22nd Street
Bayonne, Hudson County, New Jersey 07002

The Site consists of a bulk liquid storage facility/industrial park that reportedly covers an area that varied between 185 - 225 acres in size and is located in the "Constable Hook" area of Bayonne. The Site is bounded by East 22nd Street on the north; the Kill Van Kull on the south; the Exxon Bayonne Terminal ("Exxon") on the east (part of which was purchased by IMTT-BX in 1993), and portions of the Platty Kill Canal (a/k/a Platty Kill Creek) and Platty Kill Pond, also on the east; and to the west by an inlet serving the Bayonne Yacht Club and the former Bayonne Sewage Treatment Plant. The main waterfront of the Site is located along the Kill Van Kull, approximately 1.1 mile east of Newark Bay. CCA000004, CCA000023, CCA000029, CCA000034, CCA000034A, CCA000035, CCA000041, CCG000003, DDH000001

The approximate location of the Site is shown on the following annotated aerial photograph:



BAYONNE INDUSTRIES INC.
250 East 22nd Street
Bayonne, Hudson County, New Jersey

Aerial Photograph copyrighted 2009
Photo Source: Google Earth (Tele Atlas)

Site boundary line location as shown above is an approximation.

FINANCIAL VIABILITY (annual revenue, # of employees)**:**

Information obtained to date serves to identify the following entities as having acquired and being successors-in-interest to Bayonne Industries, Inc:

- IMTT Holdings, Inc. ("IMTT-HI"), formerly known as Loving Enterprises, Inc., is the holding company to all the IMTT entities. CCM000002
- International Matex Tank Terminals ("IMTT") is reported to be a key operating partnership.
- International Tank Bayonne, Inc. ("IT-Bayonne") is reported to be a minority shareholder in the key operating partnerships.
- General partner, Bayon of LA, Inc. ("Bayon of LA") was one of the entities that acquired BII. In 2007, Bayon of LA merged with and into IT-Bayonne, with IT-Bayonne being the surviving entity of the merger.
- Limited partner ITT-BT Partner, Inc. ("ITT-BT Partner") was also one of the entities that acquired BII. In 2007, ITT-BT Partner merged with and into IT-Bayonne, with IT-Bayonne being the surviving entity of the merger.
- Partnership BT was one of the entities that acquired BII. It was reported that Partnership BT changed its name to Bayonne Terminal Partnership and, as of 2007, merged with and into IMTT-Bayonne, a Delaware Partnership. IMTT-Bayonne was indicated to be the surviving entity of the 2007 merger. Further information has not been developed to date on IMTT-Bayonne, however online sources report that IMTT is doing business as IMTT-Bayonne. CCB000020
- International Tank Terminals, LLC ("ITT-LLC") is reported to be a general partner with majority shareholdings in the key operating partnerships.
- ITT-Storage, Inc. ("ITT-SI") is reported to be a general partner with majority shareholdings in the key operating partnerships.
- ITT-Bayonne Storage, Inc. ("ITT-BSI") is reported to be a minority shareholder in the key operating partnerships.
- Partnership IMTT-Bayonne is reported to be a key operating partnership. Filings have not been identified for IMTT-Bayonne to date, however, online sources report that IMTT is doing business as IMTT-Bayonne. CCB000020
- International Matex Tank Terminals (IMTT) is reported to be a key operating partnership.

Business information sources have reported BII to have annual sales of $200,000 and a total of 3 employees. A reporting year was not provided for this information. Further, available information sources have failed to disclose the net worth or total assets of BII. Dunn and Bradstreet ("D&B") has reported that the "related" business interests of BII include: International Tank Terminals Ltd., which began wholesale petroleum operations in 1946, and IMTT, which has operated as a bulk storage terminal since 1975. BII's three employees were reported to serve as the three corporate officers (President, Vice-president, and Treasurer) for BII. Two of the three BII officer-employees were listed in similar capacities as corporate partners of IMTT. The business location provided for BII was the same as for IMTT

Headquarters in New Orleans, Louisiana. Online sources have reported ownership by these officers of 100% of the capital stock of BII was owned by these officers. CCB000002, CCB000004, CCB000022

IMTT, a privately held concern based in New Orleans, reportedly has terminal facilities, similar to those at the Site, throughout North America. In 2006, it was reported that Loving Enterprises, Inc. (Huntsville, AL) was the ultimate parent of IMTT, and that Macquarie Infrastructure Company LLC (New York, NY) had acquired 50% of the common stock of Loving Enterprises, Inc. for $250 million. According to a 2009 D&B Report, IMTT has estimated annual sales of $200 million and approximately 1,000 employees. To assist in better understanding the entity relationships, and liability(ies) associated with IMTT, research regarding the related entities has been performed and is summarized in timeline format below in the Dates of Operation section. Relevant dates regarding BII are also included in the timeline. CCG000041, CCB000021

No publically available information was found regarding the financial status of the previously discussed related entities.

DATES OF OPERATION (include info. on predecessors/successors if known)**:**

Available information documents the following key dates in the corporate successorship of IMTT (and its related entities), and the history of the operations at the BII Site:

- 1870: Tidewater Oil Company ("Tidewater") owned and operated the Site as a coal terminal, oil refinery, and liquid petroleum terminal. CCG000003

- 1946: International Tank Terminals, Ltd. ("ITT-LTD") New Orleans, LA was reported to have commenced wholesale petroleum operations in 1946. CCB000002, CCB000004

- 1956: BII incorporated in the State of New Jersey, listing a principle business address of Foot of East 22nd Street, Bayonne, NJ and a main business address of 321 St. Charles Avenue, New Orleans, LA. Three officers identified at the time of filing included: Thomas Coleman, CEO; James Coleman, Jr., Other; and Charles Johnson, Secretary. CCB000006

- 1956: Tidewater sold the Site to BII, whose majority shareholders were identified as Certified Terminals, Inc. and the Pittston Company. CCG000003

- 1956-1983: BII's wholly owned subsidiary, Bayonne Terminal Warehouse Corp., operated the larger part of the facility as a non-manufacturing liquid petroleum terminal. BII also leased out portions of the property for third-party warehousing and manufacturing operations. CCG000003

- 1977: International Trading Transactions, Inc. incorporated in Louisiana. The name was changed to Bayon of LA, Inc. in 1983. CCB000014

- 1981: IMTT, a Delaware partnership, registered in Louisiana. Louisiana

Secretary of State records indicate that IMTT is currently "active" and "in good standing." The records also indicate a mailing address of 321 St. Charles Avenue, New Orleans, LA and a principal business address of 1145 Fourth Street, Harvey, LA. International Tank Terminals, Ltd. is identified as a General Partner. CCB000018

- 1983: In 1983, BII began leasing the larger (non-manufacturing liquid petroleum terminal) portion of the Site to IMTT-Bayonne. CCG000003

- 1983: IT-Bayonne incorporated in Louisiana listing a mailing address of 321 St. Charles Avenue, New Orleans, LA and a domicile address of 1145 Fourth Street, Harvey, LA. President, Secretary, and Director were identified as James O. Coleman, C.B. Johnson, and Thomas B. Coleman, respectively. The Registered Agent was listed as Darryl Daigs at the domicile address. The Louisiana Secretary of State indicated that IT-Bayonne was an "active" corporation "in good standing." CCB000007

- 1983: Partnership BT was formed in Louisiana. CCB000015

- 1983: International Trading Transactions, Inc. changed its name to Bayon of LA., Inc. CCB000014

- 1984: IT-Bayonne registered to conduct business in New Jersey listing a principal business address of 250 E 22nd Street, Bayonne. Officers listed include: Thomas Coleman, CEO; James Coleman, Jr., Other; and Charles Johnson, Secretary. CCB000008

- 1993: Certified Terminals, Inc. and Pittston Company sold their stock in BII in the fall of 1993. BII continued to lease the larger portion of the Site to IMTT-Bayonne, who continued operations as a bulk liquid terminal. CCG000003

- 1999: ITT-SI incorporated in Louisiana listing a mailing address of 321 St. Charles Avenue, New Orleans, LA and a domicile address of 1145 Fourth Street, Harvey, LA. Directors listed included: James J. Coleman, Jr., James J. Coleman, Sr., and Thomas B. Coleman. The Registered Agent was listed as Darryl Daigs at the domicile address. Louisiana Secretary of State indicated that ITT-SI was "active" and in "good standing." CCB000009

- 1999: ITT-BT Partner incorporated in LA listing a mailing address of 321 St. Charles Avenue, New Orleans, LA and a domicile address of 1145 Fourth Street, Harvey, LA. Directors listed included: James J. Coleman, Jr., James J. Coleman, Sr. and Thomas B. Coleman. The Registered Agent was listed as Darryl Daigs at the domicile address. CCB000013
- 1999: ITT-BSI incorporated in LA listing a mailing address of 321 St. Charles Avenue, New Orleans, LA and a domicile address of 1145 Fourth Street, Harvey, LA. Directors listed included: James J. Coleman, Jr., James J. Coleman, Sr., and Thomas B. Coleman. The Registered Agent was listed

as Darryl Daigs at the domicile address. ITT-BSI was reported to be an "active" corporation in "good standing." CCB000016

- 2000: ITT-LLC incorporated in LA as ITT-Jefferson, LLC listing a mailing address of 321 St. Charles Avenue, New Orleans, LA and a domicile address of 1145 Fourth Street, Harvey, LA. (Although referred to hereafter as "ITT-LLC," it was not until 2008 that the company changed its name to ITT-LLC.) Louisiana Secretary of State records indicated that ITT-LLC was a member of Loving Enterprises, Inc. The Registered Agent was listed as Darryl Daigs at the domicile address. CCB000010

- 2000: IMTT formed as a General Partnership in Delaware and named Delaware Corporation Organizers, Inc. its registered agent. IMTT was listed as a corporation in "good standing." CCB000017

- 2000: ITT-LTD merged with and into ITT-LLC, with ITT-LLC being the surviving entity. CCB000019

- 2006: On April 18, 2006, IMTT-HI incorporated in Delaware naming Delaware Corporations Organizers, Inc. as the registered agent. On May 9, 2006, IMTT-HI qualified to conduct business in Louisiana listing a mailing address of 321 St. Charles Avenue, New Orleans, LA; a principal office address of 1145 Fourth Street, Harvey, LA; and a domicile address of 201 N. Market Street, Wilmington, DE. Officers and directors included: Thomas B. Coleman, President & Director; Charles B. Johnson, Secretary /Treasurer; and James J. Coleman, Jr., Officer/Director. Louisiana Secretary of State records indicated that IMTT-HI is currently "active" and in "good standing." CBB000011, CCB000012

- 2007: ITT-BT Partner and Bayon of LA, each merged into and with IT-Bayonne, with IT-Bayonne being the surviving entity. CCB000013, CCB000014

- 2007: Partnership BT changed its name to Bayonne Terminal Partnership and merged with and into IMTT-Bayonne, a Delaware Partnership. IMTT-Bayonne was the surviving entity of the merger. CCB000015

- 2008: ITT-Jefferson, LLC. Changed its name to ITT-LLC. ITT-LLC is currently reported to be "active" and in "good standing." CCB000010

- Presently: According to a telephone call made to the City of Bayonne Tax Assessors Office on April 2, 2009, BII is the current owner of the Site. IMTT-Bayonne remains the operator.

DESCRIPTION OF FACILITY OPERATIONS (list CERCLA hazardous substances used, manufactured or present)**:**

The Site was formerly occupied by the Tidewater Oil Company (a/k/a Tidewater Refining Company), which operated a coal terminal, refinery, and petroleum liquid terminal from approximately 1870 to 1949. BII purchased the property from Tidewater in 1956. The Site has been used by BII and its lessees as a bulk liquid terminal providing storage and trans-shipment

services for fuel products, fuel-related products, plasticizers, paraffins, and other chemicals. Liquid materials are received and shipped by marine vessels, tank trucks, railcars, and pipeline. BII did not own the material stored, but simply provided warehousing and transfer services. In the 1970s, portions of the Site were leased to other companies, which are discussed in detail below. CCA000029, CCA000041, CCG000003, CCH000003, CCJ000001, CCJ000002, CCJ000003

Bayonne Industries Inc.:

The BII property has been used extensively for shipping, receiving, storage, and manufacturing of bulk chemicals for at least 50 years. Many of the bulk chemicals were used in hydrocarbon processing and refining operations. The Bayonne Terminal Warehouse, a wholly owned subsidiary of BII, stores # 2, # 4 and # 6 grade heating oils. The various petroleum products are stored in several hundred aboveground storage tanks. As mentioned, the company also operates an industrial park and leases land, buildings, and associated equipment to tenants. The Site tenants are discussed below. CCA000004, CCA000008, CAA000009, CCA000079, CCJ000004

In 1983, IMTT (d/b/a "IMTT-Bayonne") replaced BII as the operating entity for the various petroleum storage/distribution operations. It also leased various facilities from BII. IMTT-Bayonne has been identified by BII and its consultants as a tenant/operator at the Site. BII remains the owner of the Site. (Note: Certain early correspondence authored by NJDEP identified IMTT as an "owner" of the BII Site.) CCA000041, CCA000043, CCA000044, CCA000047, CCA000065, CCA000079, CCG000041, CCH000002, DDA000010

International Tank Terminals Ltd, an entity related to BII, was also reported to be a "part owner" of the Site in approximately 1993. CCB000002, DDA000002

Until 1993, the Site's address was: 250 E 22nd Street, Bayonne, NJ 07002. In April 1993, Exxon sold several portions of its adjoining properties to IMTT-BX (the "Fuels Terminal" and "Chemicals Plant"), which took on the E 22nd Street address. The remaining portion of the Exxon site (the "Lubricants Plant") was retained by Exxon and took on a new address: 1 Ave J, Bayonne, NJ 07002-5077. DDA000011, DDB000001

BII and IMTT-Bayonne have reported the use of numerous CERCLA hazardous substances that were stored, used, transported and/or manufactured at the Site including, but not limited to:

- Antifreeze coolants
- 1,4 Butanediol
- Acetone
- Caustic soda
- Calcium Naphthenate
- Diethanolamine
- Glycols
- Methylene Chloride
- Methanol
- Perchloroethylene
- Tetrahydrofurans
- Trichloroethylene
- Zinc Compounds
- Benzene

- Glycerine
- Isobutyl Methacrylate
- Methyl Ethyl Ketone
- Toluene
- Phenol
- Naphtha
- Butane
- Xylenes
- Methyl tert-butyl ether (MTBE)
- Diisobutylene

CCA000054A, CCG000003, DDA000010
Tenants who have historically leased land and occupied buildings on the BII Site include:

- Bayonne Terminal Warehouse Company (a wholly owned subsidiary of BII)
- White Chemical Corporation ("WCC")
- Rona Pearl, Inc. – a division of EM Industries, Inc. ("Rona Pearl")
- Southern California Chemical Company ("SCC")
- Co-Gen Technologies, Inc. ("Co-Gen")
- Kenrich Petrochemicals ("Kenrich")
- Theobold Industries ("Theobold")
- Metropolitan Renderers Association (a/k/a Metropolitan Rendering)

Note: At times the Southern California Chemical Co. was incorrectly referred to as "The Southern California Oil Co." - by NJDEP.

CCA000004, CCA000005, CCA000006, CCA000007, CCA000017, CCA000055, CCA000079, CCG000003, CCJ000004, DDA000010, DDH000001

Other tenants have been listed as operating at the Site since 1956, but have not been shown to have been identified with Site conditions; therefore, they are not discussed in this summary. DDA000010

The Site consisted of some 250+ aboveground bulk storage tanks, with capacities ranging from 10,000 gallons to 10.4 million gallons, configured into "yards" based generally on the products stored in the respective tank series. Numerous buildings, utilities, maintenance and general operations field stations, as well as in-plant warehousing were located at the Site. A marine vessel transfer area featuring five active piers is located along the Kill Van Kull. CCG000003

The Site is serviced by a combined storm and process sewer system, which discharged the collected wastewater to an oil/water separator pond – the Platty Kill Pond (the "Pond"). The Pond was actually the upstream end of a former creek, the Platty Kill that was dredged and straightened by Tidewater Oil Co. for use as a barge canal - the Platty Kill Canal ("Platty Kill" or "PKC"). Tidewater originally created the Pond by erecting a sheet pile dam across the PKC. Around 1971, BII built an earthen dam to replace the old one. In addition to the dam across the PKC, a floating boom in the Pond was also used to contain and collect oil that was discharged to the Pond through the sewer system. Oil and other floating substances in the pond were continuously skimmed off. Drain pipes through the dike, located at a lower elevation than the mean low water, discharged water from the Pond to the Platty Kill. The process of discharging all wastewater to the Pond resulted in a buildup of sludge and oily waste in the Pond. CAA000005, CCA000006, CCA000039, CCG000008, CCH000001, CCH000005

According to a 1972 Application to Discharge submitted by BII to the U.S. Army Corps of Engineers ("USACE"), five on-Site sewer lines discharged to the Pond. The sizes of the sewer lines were: 12 inch, 30 inch, 36 inch, 54 inch, and 68 inch. There were also two 12-inch water level control pipes that ran through the earthen dam from the Pond and discharged into the PKC. The length of the PKC (an abandoned barge slip), from the Pond to its confluence with the Kill Van Kull, is approximately 1,000 feet. The PKC is now separated from the Kill Van Kull by a sheetpile dam that was installed in 1991 under permit from the USACE. The PKC not only received discharges from the BII Site, but also from various outfall pipes that extended from the neighboring Exxon property (on the east bank of the PKC). CCA000008, CCA000008A, CCA000023, CCA000047

The following BII tenant companies were known to have discharged, through their own separate outfalls, to the Platty Kill Pond:

- White Chemical Corporation
- Rona Pearl, Inc.
- Southern California Chemical Company
- Kenrich Petrochemicals
- Theobold Industries, (a/k/a "Tank Storage Corp." – incorrectly cited as "Theobald")
- Metropolitan Renderers Association ("Metropolitan Renders")

CCA000011, CCA000014, CCH000001, DDH000002

Historically, sanitary waste was disposed of by means of on-Site septic systems. CCA000009

In 1977, BII proposed measures to NJDEP to separate BII's discharges from those of its tenant companies. In a December 1977 Certificate of Approval to construct and operate a wastewater treatment system, NJDEP noted that BII's proposed treatment system was located in the flood plain of the Kill Van Kull. CCA000016, CCA000021, CCA000049, CCA000054A, CCH000001, DDA000001, DDH000002

In 1978, an on-Site water treatment plant was installed in Yard 3 to handle the stormwater and wastewater from BII-owned operations, before being discharged to the Platty Kill via the Pond. The water treatment plant consisted of an API oil/water separator, settling lagoon, equalization and treatment, induced air flotation, and carbon adsorption. Four tenant companies, however, continued to discharge their effluents to the Pond through three separate discharge pipes. CCA000016, CCA000021, CCA000049, CCA000054A, CCG000003, CCH000001, DDA000001, DDH000002

As of 1979, it was noted that the tenant companies were in the process of applying for separate NPDES permits to discharge to the Pond. DDH000002

In 1986, all discharges to the Pond were discontinued and re-routed to discharge directly to the PKC or Kill Van Kull. Closure of the Pond, by means of bioremediation, began in the late summer of 1990. In 1992, BII entered into a Memorandum of Agreement ("MOA") with the NJDEP to conduct remedial investigation activities at the Site. This MOA related to the investigation of groundwater and soil contamination at several on-Site areas as well as the Pond. CCA000021, CCA000034A, CCG000003, CCH000001, DDA000010

In 1998, it became clear that bioremediation of the Pond would not reduce total metals content and some demonstrable fixation would be required. In 2000, a Remedial Action Workplan, submitted to NJDEP, proposed the remediation of the Pond by water management, containment/ barrier wall installation, material stabilization, and final cap installation. CCA000021, CCA000034A, CCG000003, CCH000001, DDA000010

In 2002, BII/IMTT-Bayonne renewed Discharge to Surface Water Permit No.NJ0002089, which authorized the facility to discharge into the Kill Van Kull, via the Platty Kill Canal, treated stormwater, wastewater resulting from groundwater remediation activities, and industrial wastewater associated with the storage and distribution of chemicals and refined petroleum products. This permit renewal allowed for an increase in discharge flow of treated groundwater and stormwater from the Platty Kill Pond and Canal, and also for moving the outfall pipe, identified as DSN002, from the Platty Kill Canal to directly discharge into the Kill Van Kull, as part of the remediation and closure project of the Platty Kill Pond and the Platty Kill Canal. CCG000034

On-Site sewer lines were historically constructed of wood, steel, or cast iron. The structural integrity of these lines was questionable; therefore, in 2004, BII began a remedial investigation of the sewer systems and implemented corrective action plans. CCG000003, CCG000004

Tenant - White Chemical Corporation ("WCC"):

WCC leased approximately 3.5 acres of the Site from 1961 until 1983, when it moved its operations to Newark, New Jersey. While at the BII Site, WCC manufactured a variety of compounds, predominantly chlorinated and brominated organics. The WCC site has been undergoing remedial actions under the NJDEP Bureau of Case Management since the late 1980s. Research has indicated that this company filed for bankruptcy in 1989. A Final Decree was issued on August 20, 1992. DDH000001, DDH000003, DDH000004

The main product lines manufactured at WCC during its operations in Bayonne were polybrominated biphenyls ("PBBs"), including deca-, octo-, and hexa-bromobiphenyls; acid chlorides; alkyl bromides; brominated flame retardants; pesticides; and specialty chemicals. The manufacture of flame retardant compounds and acid chlorides represented 60% - 80% of the facility's business. The remaining business was production chemicals for the agricultural and pharmaceutical industries. DDH000001

In 1983, WCC was 1 of 10 New Jersey chemical companies named by the United States Environmental Protection Agency ("USEPA") as having manufactured pesticides, herbicides, or insecticides in which dioxin compounds could occur. DDH000001

According to WCC's own records, they used or produced a number Class I, II, and III chemicals identified by the USEPA as being related to dioxin formation, as well as other chemicals regulated by the USEPA:

<u>Class I Organic Chemicals associated with the formation of dioxin:</u>

- 2,4-Dibromophenol
- Pentabromophenols
- Tribromophenols

Class II Organic Chemicals associated with the formation of dioxin:

- Tetrabromobisphenol

Class III Organic Chemicals associated with the formation of dioxin:

- Diphenyl oxide (Phenyl ether)
- Maleic anhydride
- Phthalic anhydride
- Pentabromotoluene

Dioxin Precursor Chemicals associated with the formation of dioxin:

- Monochlorobenzene
- 1,2-Dichlorobenzene

DDH000001

In 1977, USEPA conducted a 24-hour sampling survey to determine the extent of PBBs in the industrial wastewater effluent discharged to the BII Pond. Analysis of the samples indicated that PBBs were present in the overall WCC plant effluent at a concentration of 41.4 parts per billion ("ppb"). The concentration of PBB oxides in the effluent was determined to be 71.6 ppb. A water sample collected from the Pond contained 3.3 ppb PBB and a PBB oxide concentration of 16 ppb. A sediment sample collected from the Pond detected PBB oxides at 26,500 ppb. Other hazardous substances detected in WCC's effluent included: Carbon tetrachloride (245 ppb), Chloroform (5.5 ppb), Toluene (3.2 ppb), Xylene (7.8 ppb), and Tetrachloroethane (48 ppb). DDH000001

As reported by USEPA in 1988, the presence of 4,4'-DDD, a congener of DDT, was detected in soils at 83 parts per million ("ppm"). DDH000001

In 1996, sludge/sediment samples taken by BII from the Platty Kill Canal found 4,4'-DDT up to 0.15 ppm. Two of its associated congeners, 4,4'-DDD and 4,4'-DDE, were also detected in the canal up to 3.2 ppm and 2.1 ppm, respectively. DDH000001

Site Records indicate that WCC produced significant volumes of PBBs from 1973 until 1977, when their production was banned in the United States due to health and toxicological risks. During this period, approximately 500,000 lbs of PBB chemicals were produced by WCC. DDA000010, DDH000001

Tenant - Rona Pearl, Inc.:

Rona Pearl, a division of EM Industries, Inc., leased an area of the Site from the early 1970s until it terminated its lease under ISRA (Case No. 94100) oversight in July 1996. Rona Pearl's manufacture of nacreous (luminescent) pigments for the cosmetics industry continued through an interim ownership by Whitaker Corporation prior to their acquisition by EM Industries, Inc., who returned to the use of the Rona Pearl name. Additional information indicated that Rona Pearl was "an Associate of E. Merck." Hazardous substances stored and utilized included (but not limited to) ammonia, butyl acetate, methanol, nitric acid, and both halogenated and non-halogenated solvents. Wastewater generated from Rona Pearl manufacturing operations contained suspended solids and bismuth. CCG000003, DDA000010, DDD000002, DDD000003

Tenant - Southern California Chemical Company:

SCC leased an area in the Yard 10 portion of the Site for approximately 8-10 years during the 1972 to 1981 timeframe. The company was involved in the treatment and reclamation of spent and contaminated etching solutions through neutralization and metal precipitation. These activities were conducted in a building identified in a Tidewater site plan as the "Plate Shop" building.

The SCC facility utilized tank and container storage, treatment tanks/vats, and a cement-lined pit/surface impoundment. Heavy metals were precipitated out of the spent solutions, with the metal sludge going to the pit, prior to off-site shipment, and the supernate being discharged to the Platty Kill Pond via the on-Site sewer system. Reports vary as to when SCC actually vacated the premises, but operations were being phased out in 1981. USEPA conducted an inspection of the facility in June 1981, as operations were closing down, and noted "[a]n alternate drain from the [concrete washwater] pit was reportedly linked to a storm sewer." A May 1982 follow-up inspection by USEPA indicated that all drums and tanks had been removed, and that the process building was empty. The process building was eventually demolished when Yard 10 was leased to Co-Gen Technologies in 1985. BII turned the rest of the property into a tank farm. CCG000003, DDA000010, DDC000001, DDC000002, DDC000003, DDC000004, DDC000005, DDC000007, DDC000008

Tenant - Co-Gen Technologies, Inc.:

Co-Gen Technologies operates a cogeneration plant in Yard 10 of the BII facility, in the same area where SCC previously operated. They began leasing the property from BII in June 1985. Their operations drive electric generators off of high-pressure steam generated on-Site, from which, low-pressure steam is dispatched to a number of industrial operations in the Constable Hook area. The company owns and operates three package boilers, which are located in BII's boiler house. CCG000003, CCG000008, DDA000010

Tenant - Kenrich Petrochemicals, Inc.:

Kenrich was identified by NJDEP as a "tenant" of the BII "complex." The company was involved in the blending of petrochemicals into product for resale. Some of the substances used in their processes included:

- Aromatic Hydrocarbons
- Dimethyl Naphthalene (commonly known as "Kenflex")
- Caustic Soda
- Cumyl Phenol

DDE000001, DDE000002

Information sources further revealed that Kenrich also manufactured: plasticizers, resins, dispersions and titanium coupling agents, zirconate coupling agents, aluminate coupling agents, and chemicals. Wastes on-Site have included: halogenated and non-halogenated solvents, cadmium, lead, arsenic, formaldehyde, naphthalene, and ignitable and corrosive liquids. CCA000006, CCG000003, DDD000003, DDE000001, DDE000002

Tenant - Theobold Industries, Inc.:

Theobold was also identified by NJDEP as a "tenant" of the BII "complex". The company was a major industrial oil and shortening compound producer. CCA000006, DDF000001, DDF000002

Tenant - Metropolitan Renderers Association:

Metropolitan Renderers was a tenant at the BII property. The company operated as a dry rendering plant and produced tallow, which was used for dog food, chicken feed, etc. The raw materials used in their manufacturing processes consisted of butcher scraps, which included fats and bones. Process wastewaters passed through a separator and trap, prior to discharging to the Platty Kill Canal. DDG000001

SOIL SAMPLING AND CONTAMINATION:

Bayonne Industries:

Soil sampling and analysis conducted in 2002 and 2003 detected the following hazardous substances in Site soils at the levels indicated:

- 1,2-Dichlorobenzene up to 2.88 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- 1,3-Dichlorobenzene up to 0.619 ppm
- 1,4-Dichlorobenzene up to 1.66 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- Benzene up to 8.37 ppm
- Ethylbenzene up to 8.25 ppm
- Toluene up to 6.02 ppm
- Xylene (total) up to 13.92 ppm

- 2-Methylnaphthalene up to 32.8 ppm
- Acenaphthene up to 19.3 ppm
- Anthracene up to 0.114 ppm
- Benzo(a)anthracene up to 9.93 ppm
- Benzo(a)pyrene up to 10.20 ppm
- Benzo(b)fluoranthene up to 3.26 ppm
- Benzo(g,h,i)perylene up to 2.09 ppm
- Benzo(k)fluoranthene up to 3.67 ppm
- Dibenzo(a,h)anthracene up to 0.249 ppm
- Chrysene up to 10 ppm
- Fluoranthene up to 18.5 ppm
- Fluorene up to 28.4 ppm
- Indeno(1,2,3-cd)pyrene up to 0.1 ppm
- Naphthalene up to 3.19 ppm
- Phenanthrene up to 54.1 ppm
- Pyrene up to 5.94 ppm
- Petroleum Hydrocarbons up to 122,000 ppm
- Total Organic Carbon (TOC) up to 122,057 ppm
- Total Volatile Organic Compounds (VOCs) up to 409 ppm

- Arsenic up to 399 ppm
- Barium up to 1,770 ppm
- Cadmium up to 3.34 ppm
- Chromium up to 245 ppm
- Lead up to 7,240 ppm
- Mercury up to 3 ppm

CCG000003

Tenant - White Chemical Corporation:

Soil sampling conducted in 1977 and 1987 on the WCC portions of the Site detected the following hazardous substances at the levels indicated:

- PBB isomers up to 2.8 ppm
- 4-Bromodiphenyl ether up to 8.1 ppm
- Decabromodiphenyl ether (a/k/a Decabromodiphenyl oxide) up to 56,000 ppm

- Pentachlorophenol up to 9.5 ppm (USEPA Class I Pesticide associated with the formation of dioxin)
- 2,4-Dinitrophenol up to 6.5 ppm (USEPA Class III Organic Chemical associated with the formation of dioxin)
- Phenol up to 6.1 ppm (USEPA Class III Organic Chemical associated with the formation of dioxin)
- Chlorobenzene up to 1.3 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)

- 4,4'-DDD up to 83 ppm
- Aldrin up to 2.9 ppm
- delta-Benzene Hexachloride ("BHC") up to 11 ppm
- Endrin ketone up to 120 ppm

- 1-Bromooctadecane up to 77,000 ppm
- 1-Bromotetradecane up to 2.3 ppm
- Bromododecane up to 180 ppm
- Benzene up to 22 ppm
- Chloroform up to 1.5 ppm
- Methylene chloride up to 0.52 ppm
- Tetrachloroethane up to 50 ppm
- Tetrachloroethene up to 2.2 ppm
- Toluene up to 23 ppm
- trans-1,2-Dichloroethene up to 1.9 ppm
- Trichloroethene up to 1.6 ppm

- 2-Chloronaphthalene up to 130 ppm
- 4,6-Dinitro-2-methylphenol up to 5.6 ppm
- bis(2-Ethylhexyl)phthalate up to 6.8 ppm
- Benzo(a)anthracene up to 3 ppm

- Benzo(a)pyrene up to 6.2 ppm
- Benzo(b)fluoranthene up to 5.3 ppm
- Chrysene up to 4.8 ppm
- Fluoranthene up to 7.6 ppm
- Hexachlorobutadiene up to 9.4 ppm
- N-Nitrosodiphenylamine up to 6.4 ppm
- Naphthalene up to 24 ppm
- Nitrobenzene up to 100 ppm
- Phenanthrene up to 9.4 ppm
- Phenols up to 63 ppm
- Pyrene up to 8.6 ppm
- Total Petroleum hydrocarbons ("TPH") up to 23, 000 ppm
- Antimony up to 59 ppm
- Arsenic up to 120 ppm
- Barium up to 1.6 ppm
- Beryllium up to 9.6 ppm
- Cadmium up to 13 ppm
- Chromium up to 110 ppm
- Copper up to 5,500 ppm
- Lead up to 940 ppm
- Mercury up to 580 ppm
- Nickel up to 1,600 ppm
- Selenium up to 3 ppm
- Thallium up to 1.7 ppm
- Zinc up to 1,400 ppm
- Cyanide up to 0.99 ppm

DDH000001

In accordance with the provisions of a 1983 Administrative Consent Order ("ACO") issued to WCC by NJDEP, soil samples were collected and analyzed for the dioxin 2,3,7,8-TCDD on June 7, 1983. Analysis of the samples was complicated by the high levels of other contaminants in the soil. Dioxin was not detected in any of the samples; however, the detection limit of the analysis was set at 1.7 ppb. No re-sampling or analysis is known to have been conducted at that time. CCG000003, DDH000001

In 1988, NJDEP recommended that further sampling episodes should include analyses for dioxin, as precursors were historically used at the facility and have been detected in site soils and discharge sediments. Dioxin sampling is not known to have been completed at the Site to date. DDH000001

Soil samples in a stained area on Site, as well as a "drainage trough," indicated the "qualitative presence of dibromo-, tribromo-, tetrabromo-, pentabromo-, hexabromo-, heptabromo-, octabromo-, nonabromo-, and decabromo-phenyl compounds," which coincide with compounds utilized/produced by WCC. DDH000001

Sampling events ordered by NJDEP in 1987 revealed extensive contamination of Site soils with organics, metals, cyanides, phenols, petroleum hydrocarbons, and pesticides. PBB isomer levels were indicated as high as 2,800 ppb and Total Isomers up to 750 ppb. DDH000001

The presence of 4,4'-DDD, a congener of DDT, was also detected in soils at 83,000 ppb in 1988, as reported by USEPA. DDH000001

Tenant - Southern California Chemical:

Soil sampling data obtained in 1981 from portions of the Site that were operated by the tenant SCC reveal "high concentrations of lead, chromium, and nickel." DDC000006

GROUNDWATER SAMPLING AND CONTAMINATION:

Bayonne Industries:

Bayonne Industries implemented groundwater investigation activities in 1978 and again in 1990. The 1978 investigation was required as a result of an ACO to determine the extent of free oil on the groundwater table and to establish a free-oil recovery program. CCG000003

Groundwater quality was evaluated between 1990 and 1992 for volatile organic compounds only. The following substances were most frequently found at levels above groundwater quality criteria:

- Benzene (up to 10.845 ppm)
- Total Xylenes (in excess of 1 ppm)
- Toluene*
- Vinyl Chloride*
- Chloroform*
- trans-1,2-Dichloroethene*

* Concentration levels not reported
CCG000003

Other references confirm that there is documented groundwater contamination in the area associated with oil and petroleum products that resulted from the Site's historical use as a petroleum refinery and storage facility. DDH000001

Groundwater depth across the Site ranges from 1 to 18 feet below grade, and generally flows to the south-southwest toward the Kill Van Kull, except in the immediate vicinity of the PKC. CCA000023

ON-SITE SEDIMENT SAMPLING AND CONTAMINATION:

From Catch Basins and Sewer Structures:

Sediment samples collected and analyzed from on-Site sewer structures in 2005 detected the following hazardous substances at the levels indicated:

- 2,4,5-Trichlorophenol up to 3.85 ppm (USEPA Class I Organic Chemical associated with the formation of dioxin)
- Pentachlorophenol up to 30.9 ppm (USEPA Class I Pesticide associated with the formation of dioxin)

- 1,2-Dichlorobrenzene up to 0.459 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- 1,4-Dichlorobenzene up to 0.169 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- Chlorobenzene up to 19.9 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- 1,2-Dichloroethene up to 3.687 ppm
- Benzene up to 7.98 ppm
- Chloroform up to 19.9 ppm
- Ethylbenzene up to 3.03 ppm
- MTBE up to 0.323 ppm
- Styrene up to 0.296 ppm
- Toluene up to 1.75 ppm
- Trichloroethene up to 0.445 ppm
- Xylenes up to 2.24 ppm
- Other Isomers of Benzene up to 249 ppm
- VOCs (total) up to 651.735 ppm

- 2-Methyl naphthalene up to 87.3 ppm
- Acenaphthene up to 174 ppm
- Anthracene up to 27.3 ppm
- Benzo(a)anthracene up to 18 ppm
- Benzo(b)fluoranthene up to 9.11 ppm
- Benzo(k)fluoranthene up to 3.79 ppm
- Benzo(a)pyrene up to 4.87 ppm
- bis(2-Ethylhexyl)phthalate up to 49.6 ppm
- Chrysene up to 20 ppm
- Fluoranthene up to 40.7 ppm
- Fluorene up to 64.5 ppm
- Naphthalene up to 42.8 ppm
- Phenanthrene up to 117 ppm
- Phenol up to 30.5 ppm
- Pyrene up to 31.8 ppm
- Total Petroleum Hydrocarbons (“TPH”) up to 60,100 ppm
- SVOCs up to 2,156.5 ppm

- Antimony up to 26.8 ppm
- Arsenic up to 72 ppm
- Beryllium up to 0.63 ppm
- Cadmium up to 1.77 ppm
- Chromium up to 192 ppm
- Copper up to 1,380 ppm
- Cyanide up to 0.75 ppm
- Lead up to 35,300 ppm
- Mercury up to 2.2 ppm
- Nickel up to 221 ppm
- Thallium up to 1.32 ppm
- Zinc up to 9,410 ppm

From the Platty Kill Pond:

Sludge samples that were collected and analyzed in 1979, 1981, and 1990 through 1995 from the Pond detected the following hazardous substances at the levels indicated:

- PBB oxides up to 26.5 ppm
- 1,2-Dichlorobenzene up to 6,100 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- 1,4-Dichlorobenzene up to 1,600 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- Chlorobenzene up to 3,900 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- 1,3-Dichlorobenzene up to 880 ppm
- 1,2-Dichloroethane up to 790 ppm
- Benzene up to 150 ppm
- Ethylbenzene up to 220 ppm
- Toluene up to 980 ppm
- Xylenes (total) up to 640 ppm
- TPH up to 230,000 ppm

- Acenaphthene up to 170 ppm
- Acenaphthylene up to 170 ppm
- Anthracene up to 91 ppm
- Benzo(a)pyrene up to 46 ppm
- Benzo(b)fluoranthene up to 63 ppm
- bis(2-Ethylhexyl)phthalate up to 110 ppm
- Chrysene up to 69 ppm
- Fluoranthene up to 90 ppm
- Fluorene up to 212 ppm
- Hexachloroethane up to 533 ppm
- Naphthalene up to 1,300 ppm
- Phenols up to 59.6 ppm
- Phenanthrene up to 620 ppm
- Pyrene up to 161 ppm

- Aluminum up to 12,500 ppm
- Antimony up to 15.6 ppm
- Arsenic up to 833 ppm
- Barium up to 1,060 ppm
- Cadmium up to 24.6 ppm
- Chromium up to 415 ppm
- Cobalt up to 63.4 ppm
- Copper up to 5,588 ppm
- Lead up to 26,600 ppm

- Magnesium up to 10,700 ppm
- Manganese up to 589 ppm
- Nickel up to 234 ppm
- Vanadium up to 176 ppm
- Zinc up to 1,110 ppm

CCA000021, CCA000022, CCA000049, CCA000050, CCA000053, CCA000059, CCA000077, CCA000078, CCH000001, CCH000003

Sampling for dioxins was not performed at the Pond, despite the use and production of many dioxin-associated compounds by the tenant White Chemical. The presence of PBB Oxides was found in sediment samples taken from the Pond at concentrations up to 26.5 ppm during sampling in 1977 associated with discharges from White Chemical. CCA000022

OFF-SITE SEDIMENT SAMPLING AND CONTAMINATION:

From Platty Kill Canal Sediments:

Sediment samples were collected and analyzed from the PKC in 1994 and 1996, as part of the Phase I and II Sediment Investigations, respectively. The following hazardous substances, similar to those found on-Site and in the Platty Kill Pond, were detected in PKC sediments at the levels indicated:

Total Polybrominated Biphenyls ("PBBs") isomers up to 290 ppm

<u>Organochlorine Pesticides:</u>

- gamma-BHC (Lindane) up to 0.086 ppm (EPA Class II Pesticide Chemical associated with the formation of dioxin)
- 4,4'-DDD up to 3.4 ppm
- 4,4'-DDE up to 2.1 ppm
- 4,4'-DDT up to 0.15 ppm
- alpha-BHC up to 0.22 ppm
- alpha-Chlordane up to 0.4 ppm
- Aldrin up to 0.058 ppm
- delta-BHC up to 0.87 ppm
- Dieldrin up to 0.86 ppm
- Endrin up to 0.11 ppm
- gamma-Chlordane up to 0.52 ppm
- Heptachlor up to 0.65 ppm

<u>Organics:</u>

- 1,4-Dichlorobenzene up to 15 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- Chlorobenzene up to 65 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- 1,3-Dichlorobenzene up to 7.6 ppm
- 1,2-Dichloroethane up to 0.73 ppm
- Benzene up to 28 ppm
- Ethylbenzene up to 71 ppm

- Toluene up to 54 ppm
- Xylenes (total) up to 500 ppm
- Acenaphthene up to 46 ppm
- Acenaphthylene up to 2.8 ppm
- Anthracene up to 53 ppm
- Benzo(a)anthracene up to 16 ppm
- Benzo(a)pyrene up to 11 ppm
- Benzo(b)fluoranthene up to 7.1 ppm
- bis(2-Ethylhexyl)phthalate up to 93 ppm
- Chrysene up to 41 ppm
- Diethylphthalate up to 790 ppm
- Fluoranthene up to 95 ppm
- Fluorene up to 130 ppm
- Naphthalene up to 260 ppm
- Phenanthrene up to 250 ppm
- Pyrene up to 78 ppm
- TOC up to 160,000 ppm
- TPH up to 170,000 ppm

Inorganics:

- Aluminum up to 28,600 ppm
- Arsenic up to 629 ppm
- Barium up to 1,330 ppm
- Cadmium up to 14.6 ppm
- Chromium up to 534 ppm
- Cobalt up to 86.4 ppm
- Copper up to 1,560 ppm
- Lead up to 11,600 ppm
- Magnesium up to 11,700 ppm
- Manganese up to 2,090 ppm
- Mercury up to 13.2 ppm
- Nickel up to 273 ppm
- Vanadium up to 259 ppm
- Zinc up to 1,530 ppm

CCA000018, CCA000023, CCA000047, DDH000001

Sampling for dioxins was not performed in the PKC. Sampling conducted in 1977 regarding discharges from White Chemical portions of the Site indicated PBB isomers to be present in surface water and sediments collected from the PKC. A peak concentration of 290,000 ppb of Total PBB Isomers was detected in sediments collected at the head of the PKC. DDH000001

Mercury concentrations up to 8.5 ppm were detected in sludge samples taken from the old gate area, and up to 13.2 ppm in sludge samples taken from the PKC. CCA000047, CCA000077

4,4'-DDT was found in sludge samples taken from the PKC at concentrations up to 0.15 ppm. The associated DDT congeners: 4,4'-DDE and 4,4'-DDD were also found in sludge samples taken from the PKC in concentrations up to 2.1 ppm and 3.4 ppm, respectively. CCA000047

BII estimated that there was approximately 7,488 cubic yards of contaminated sediment in the Platty Kill Canal. CCG000032

***From Kill Van Kull Sediments**:*

Phase II NBSA sediment sampling conducted in the Kill Van Kull, at the mouth of the PKC (Core 096) in October through December 2007, indicated contamination matching the hazardous substances found on-Site and in the Platty Kill Pond. The following hazardous substances were detected in the core sample at the levels indicated:

- 2,3,7,8-TCDD up to 0.956 ppb
- Total TCDD up to 1.2 ppb
- Dioxin TEQ up to 1.09 ppb

- 2,4,5-T (2,4,5-Trichlorophenoxyacetic acid) up to 0.046 ppm (USEPA Class I Pesticide Chemical associated with the formation of dioxin)
- 2,4,5-TP (Silvex: 2,4,5-Trichlorophenoxypropionic acid) up to 0.3 ppm (USEPA Class I Pesticide Chemical associated with the formation of dioxin)
- 2,4-D (2,4-Dichlorophenoxyacetic acid) up to 0.34 ppm (USEPA Class I Pesticide Chemical associated with the formation of dioxin)
- Chlorobenzene up to 11 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- 1,2-Dichlorobenzene up to 0.032 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- 1,4-Dichlorobenzene up to 0.71 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)

- 4,4'-DDD up to 0.13 ppm
- 4,4'-DDE up to 0.17 ppm
- 4,4'-DDT up to 0.073 ppm
- DDT (total) up to 0.407 ppm

- Aldrin up to 0.0017 ppm
- alpha-Chlordane up to 0.035 ppm
- Dieldrin up to 0.12 ppm

- bis(2-Ethylhexyl)phthalate up to 21 ppm
- Butylbenzylphthalate up to 0.1 ppm
- Fluoranthene up to 18 ppm
- Fluorene up to 15 ppm
- Naphthalene up to 9.9 ppm
- n-Nitrosodiphenylamine up to 12 ppm
- Phenanthrene up to 45 ppm
- Pyrene up to 20 ppm
- TPH up to 31,000 ppm

- Arsenic up to 69.6 ppm
- Barium up to 506 ppm

- Beryllium up to 1.1 ppm
- Cadmium up to 17.1 ppm
- Chromium up to 507 ppm
- Copper up to 522 ppm
- Lead up to 464 ppm
- Mercury up to 14.1 ppm
- Nickel up to 80.6 ppm
- Thallium up to 0.3 ppm
- Vanadium up to 90.9 ppm
- Zinc up to 712 ppm

PERMITS (provide dates)**:**

NPDES:

Bayonne Industries/IMTT-Bayonne:

NPDES Permit No. NJ001341:

In 1976, BII was originally issued NPDES Permit No. NJ001341 by USEPA. NJDEP opined to USEPA that the Platty Kill Pond was "legally a water of the United States (as well as a water of the State). Therefore any permits issued by your agency should treat this 'pond' as the receiving stream." CCA000005, CCA000068

In 1981, when BII applied for renewal of this permit, they were advised that the jurisdiction for this permit was transferred to the State of New Jersey. Subsequently, BII requested that NJDEP include IMTT-Bayonne as a co-holder of the permit, since they were leasing all of the BII facilities. BII continued to own the property. CCA000065

NJPDES Permit No. NJ0001341:

In 1985, NJDEP issued NJPDES Permit No. NJ0001341 to BII, which in effect terminated the industrial wastewater discharge to the Pond, but continued to authorize the discharge of stormwater from the Site to the Kill Van Kull via PKC until July 1990. CCA000017

NJPDES Permit No. NJ0002089:

In 1995, IMTT-BX submitted an application to NJDEP for the renewal of NJPDES Discharge to Surface Water Permit No. NJ0002089. In 1993, IMTT-BX had become the Permittee and Exxon Corporation the Co-Permittee for this permit. The IMTT-BX/ Exxon facilities are located on approximately 250 acres on the east side of the Platty Kill Canal. IMTT requested a modification of this permit in order to integrate, over time within this permit, the treatment of effluent that was currently being discharged from the IMTT-Bayonne/Bayonne Industries facility under the terms of NJPDES Permit No. NJ0001341. DDA000011

In 2002, NJDEP issued draft NJPDES Permit No. NJ0002089 to IMTT-Bayonne. The provisions of the permit included the discharges from the BII facility. In addition, the

permit authorized the relocation of outfall DSN 002 from the north end of the PKC to discharge directly to the Kill Van Kull and the increased discharge flow of treated groundwater and stormwater in order to accommodate the remediation and closure of the Pond and PKC. CCG000034

POTW (pretreatment):

No information is available at this time.

Others:

Waterfront Development Permit No. 00-0452-1:

A permit was issued to BII by NJDEP, effective February 10, 1981 through February 10, 1984 to fill and stabilize areas of the Pond. CCA000054

Waterfront Development Permit No. 0901-90-0003.6:

A permit was issued to BII by NJDEP, effective January 7, 1999 through January 7, 2004, authorizing the installation of a pneumatic barrier system at the Pier 3 berthing facility on the Kill Van Kull to reduce sedimentation in the berthing area. CCA000001

Tenants of BII were issued the following NPDES permits:

NPDES:

White Chemical Company - Permit No. NJ0001538:

In 1979, WCC was issued NPDES Permit No. NJ0001538, which authorized the discharge of non-contact cooling and scrubber waters, through on-Site sewer lines, to the PKC via the BII Pond. DDH000001, DDH000002

Rona Pearl - Permit No. NJ0030449:

Rona Pearl was issued NPDES Permit No. NJ0030449, which authorized the discharge of wastewaters to the PKC via the BII Pond. CCG000003, DDA000001, DDH000002

Southern California Chemical Co. - Permit No. NJ0030481:

SCC was issued NPDES permit No. NJ0030481, which authorized the discharge process wastewaters to the Kill Van Kull via the BII Pond and PKC. DDC000007, DDH000002

Kenrich Petrochemicals, Inc. - Permit No. NJ003018:

Kenrich Petrochemicals was issued NPDES Permit No.NJ003018 for the discharge of wastewaters to the Kill Van Kull via the BII Pond and PKC. DDE000003, DDH000002

Theobold Industries - Permit No. NJ003387:

Theobold Industries was issued NPDES Permit No. NJ003387, which authorized the discharge of wastewaters to the PKC via the BII Pond. DDH000002

POTW (pretreatment):

No information is available at this time.

NEXUS TO NEWARK BAY STUDY AREA (describe in detail; cite to supporting documentation; date or time period of disposal; list CERCLA hazardous substances; and volume, if known):

Direct (e.g. pipe, outfall, spill):

BII/IMTT-Bayonne:

As previously discussed in the Off-Site Sediment Sampling and Contamination section, numerous hazardous substances, similar to those found on-Site (including the Platty Kill Pond), were detected in Platty Kill Canal and Kill Van Kull sediments. The Kill Van Kull, a significant tidal tributary to Newark Bay, certainly contributes sediments and hazardous substances into Newark Bay, a short distance west of the Site.

In 1999, NJDEP noted that "BI proposes to solidify the sludge in the pond, so that it will cease being a source of contamination to ground water and the nearby Kill Van Kull waterway, into which the Creek discharges." CCG000008

It has been reported by ENSR, consultants for IMTT-Bayonne that up until the mid-1950s the on-Site Pond received all discharges from surface waters and process wastewaters from the refinery and other tenants at the Site. CCA000063

The on-Site Pond that was utilized by BII and at least six tenants was created by the construction of an earthen dam which was placed across the PKC. NJDEP characterized the earthen bulkhead (dam) as "porous." Its use was eventually discontinued in approximately 1976 - 1977. CCA00005, CCA000016, CCA000050, CCA000058, DDH000002

As indicated above, sludge samples taken from the pond indicated the presence of high levels of hazardous substances. CCA000021, CCA000022, CCA000049, CCA000059, CCA000077

In about 1972, the following hazardous substances were found in the Site effluent flows to discharge Outfall # 001, which discharges to the Kill Van Kull, via the Pond and PKC: ammonia, chromium, copper, zinc, oil/grease, phenols. CCA000008, CCA000008A

In 1978, elevated levels of oil and grease up to 128 ppm and petroleum hydrocarbons up to 20.5 ppm were detected in the effluent that discharged to Outfall # 001. CCA000014

In 1984, USEPA observed an oil slick/sheen in the Platty Kill lagoon due to the presence of oily water and sludge in the Pond. CCA000050

NJDEP issued an "Unacceptable" notice to IMTT-Bayonne in 1988, which was related to violations of NPDES Permit No. NJ0001341, based on the following:

- The Platty Kill Pond was grossly contaminated with oil.

- As a result of seepage from the Pond and the PKC, unpermitted discharges of oil-contaminated wastewaters entered the surface waters of the United States.

- IMTT-Bayonne failed to monitor for toxic organic pollutants at Outfall DSN 001.

DDA000003

NJDEP issued an "Unacceptable" rating to IMTT-Bayonne in 1989, which was related to violations of NPDES Permit No. NJ0001341. These violations were based on the following:

- Discharge Monitoring Reports ("DMR") for the period of 12/88 through 4/89 revealed that the facility exceeded effluent limitations at Outfall DSN 001.

- The facility did not sample for Toxic Organic Pollutants during the monitoring period of 12/88 through 4/89.

- The Platty Kill Pond was grossly contaminated with oil.

- As a result of seepage from the pond and the PKC, unpermitted discharges of oil-contaminated wastewaters were allowed to enter the surface waters of the United States.

DDA000004

In 1990, IMTT-Bayonne received a Notice of Violation ('NOV") for exceeding the parameters of its discharge permit (NJ0001341) for the period of 7/89 through 4/90. DDA000008

In 1991, NJDEP issued an "Unacceptable" notice to IMTT–Bayonne, which was related to violations of its NPDES Permit #NJ 0001341, as reported in a Discharge Surveillance Report. The report noted that there was a visible sheen at the Wemco Lagoon and that there was also contamination evident at the Platty Kill Pond. (Note: the Wemco Lagoon is a lined pond, smaller in size than the Platty Kill Pond, which operates in conjunction with the on-Site wastewater treatment facility. The original Platty Kill Pond was an unlined pond approximately ½-acre in size.) DDA000005

NJDEP issued an unacceptable rating to IMTT–Bayonne, which was noted in a Discharge Surveillance Report, stating that there were seven permit violations for exceedances of its Permit NJ0001341 for the period of 4/90 through 3/91. DDA000006, DDA000007

In 1994, it was reported that a large diameter pipe discharged petroleum-tainted liquids to the PKC. CCA000029

As previously discussed, sediment samples were collected and analyzed from the PKC in 1994 and 1996, as part of the Phase I and II Sediment Investigations, respectively. The following hazardous substances, similar to those found on-Site and in the Platty Kill Pond, were detected in PKC sediments at the levels indicated:

Total Polybrominated Biphenyls ("PBBs") isomers up to 290 ppm

Organochlorine Pesticides:

- gamma-BHC (Lindane) up to 0.086 ppm (EPA Class II Pesticide Chemical associated with the formation of dioxin)
- 4,4'-DDD up to 3.4 ppm
- 4,4'-DDE up to 2.1 ppm
- 4,4'-DDT up to 0.15 ppm
- alpha-BHC up to 0.22 ppm
- alpha-Chlordane up to 0.4 ppm
- Aldrin up to 0.058 ppm
- delta-BHC up to 0.87 ppm
- Dieldrin up to 0.86 ppm
- Endrin up to 0.11 ppm
- gamma-Chlordane up to 0.52 ppm
- Heptachlor up to 0.65 ppm

Organics:

- 1,4-Dichlorobenzene up to 15 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- Chlorobenzene up to 65 ppm (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- 1,3-Dichlorobenzene up to 7.6 ppm
- 1,2-Dichloroethane up to 0.73 ppm
- Benzene up to 28 ppm
- Ethylbenzene up to 71 ppm
- Toluene up to 54 ppm
- Xylenes (total) up to 500 ppm
- Acenaphthene up to 46 ppm
- Acenaphthylene up to 2.8 ppm
- Anthracene up to 53 ppm
- Benzo(a)anthracene up to 16 ppm
- Benzo(a)pyrene up to 11 ppm
- Benzo(b)fluoranthene up to 7.1 ppm
- bis(2-Ethylhexyl)phthalate up to 93 ppm
- Chrysene up to 41 ppm
- Diethylphthalate up to 790 ppm
- Fluoranthene up to 95 ppm
- Fluorene up to 130 ppm
- Naphthalene up to 260 ppm
- Phenanthrene up to 250 ppm
- Pyrene up to 78 ppm

- TOC up to 160,000 ppm
- TPH up to 170,000 ppm

Inorganics:

- Aluminum up to 28,600 ppm
- Arsenic up to 629 ppm
- Barium up to 1,330 ppm
- Cadmium up to 14.6 ppm
- Chromium up to 534 ppm
- Cobalt up to 86.4 ppm
- Copper up to 1,560 ppm
- Lead up to 11,600 ppm
- Magnesium up to 11,700 ppm
- Manganese up to 2,090 ppm
- Mercury up to 13.2 ppm
- Nickel up to 273 ppm
- Vanadium up to 259 ppm
- Zinc up to 1,530 ppm

CCA000018, CCA000023, CCA000047, DDH000001

In January 2003, IMTT-Bayonne notified the NJDEP of a discharge of stormwater through an outfall not covered under their NJPDES permit. On January 14th, stormwater was observed discharging through an unpermitted overflow pipe from the Platty Kill Pond into the Platty Kill Canal, believed to be due to a faulty plug in a storm sewer line. A grab sample of the stormwater that was discharged indicated the following hazardous substances at the levels indicated:

- Chlorobenzene at 1.1 ppb (USEPA Dioxin Precursor Chemical associated with the formation of dioxin)
- Benzene at 1.7 ppb
- 1,2-Dichloroethane at 0.44 ppb
- cis-1,2-Dichloroethene at 1.8 ppb
- Ethylbenzene at 0.49 ppb
- Toluene at 2.2 ppb
- Trichloroethene at 0.60 ppb
- Xylenes at 1.7 ppb
- Lead at 3.1 ppb
- Nickel at 43.3 ppb

CCA000035

In February of 2003, a 20,000 gallon spill of #6 fuel oil occurred in Yard 6, Tank #6003. According to regulatory documents, the storm drain inlets in the bermed tank farm were impacted by this discharge. CCG000001, CCG000002, CCG000003

In 2004, NJDEP reported that approximately 51,000 gallons of sodium hydroxide leaked in Yard 1 over a period of 12 days. CCG000006, CCG000011

NJDEP notified BII and ExxonMobil that they were **jointly and severally responsible** for the contamination of the PKC. This canal lies on the border of both company

properties and flows to the Kill Van Kull. In approximately 2000, BII and ExxonMobil agreed to, and assumed responsibility for, jointly conducting the remediation of this canal. Since that time, various remedial efforts have been undertaken, including the installation of recovery wells and new bulkhead to prevent the flow of petroleum hydrocarbons to PKC and the Kill Van Kull. Final remedial options to deal with the contaminated sediments within PKC are presently under consideration, based on site records reviewed. CCA000036, CCA000041, CCA000042, CCA000043

Tenant--White Chemical:

WCC discharged its wastewaters to the PKC via the on-Site Pond. In 1971, WCC filed its initial application to USEPA for a NPDES permit. The application was later revised in 1972 and again in 1977. In 1977, in relation to WCC's revised permit application, NJDEP collected effluent discharge samples, which indicated the presence of the following hazardous substances: chloroform, carbon tetrachloride, toluene, xylene and tetrachloroethene. Due to the nature of this discharge, NJDEP required pretreatment of the waste prior to discharge. WCC was issued its final permit in 1979, and was subject to a discharge compliance schedule outlined in a Findings of Violation and Order for Compliance issued to WCC by USEPA on March 29, 1979. DDH000001

In June of 1977, a report prepared by Environmental Science and Engineering indicated that a variety of samples had been collected at WCC and were analyzed for PBB isomers. The media, from which the samples were collected, included soil, surface water, and sediment from the Site and the PKC. PBB isomers were found to be present in all of these media. A peak concentration of 290,000 ppb of Total PBB Isomers was detected in sediments collected at the head of PKC. DDH000001

In August of 1977, a 24-hour sampling survey was conducted by USEPA to determine the extent of PBB contamination in the industrial wastewater effluent discharged by WCC. Despite the fact that the plant was not producing PBB oxides at the time of sample collection, the concentration and load of PBB oxides in the overall wastewater effluent was determined to be 71.6 ppb and 0.44 pounds per day respectively. The sediment collected from the separation basin had a PBB oxide concentration of 26,500 ppb. DDH000001

WCC has been issued many NOVs by NJDEP between the late 1970s and early 1980s for improper storage and handling of waste materials on the Site. Inspectors documented deteriorating and leaking drums and spills on the Site and suspected that WCC dumped waste materials directly on the ground. Soil samples in a stained area on site indicated the "qualitative presence of dibromo-, tribromo-, tetrabromo-, pentabromo-, hexabromo-, heptabromo-, octabromo-, nonabromo-, and decabromo-phenyl compounds," which coincides with compounds utilized/produced by WCC. DDH000001

In 1980, The Hudson Regional Health Commission reported that a spill of pivaloyl chloride (trimethylacetyl chloride) occurred at the WCC facility. The spill was treated with water, which triggered a reaction that caused a vapor cloud of pivalic acid and hydrochloric acid to form. The vapor traveled west beyond the perimeter of the BII complex. DDH000005

In August of 1983, NJDEP issued an Administrative Consent Order to WCC to develop a sampling/analytical plan to address all areas of the site. In 1987, WCC conducted soil

sampling at former operational areas of the site. The analytical results indicated extensive contamination with organics, metals, cyanides, phenols, petroleum hydrocarbons, brominated phenols and pesticides. DDH000001

Tenant--Rona Pearl:

During an NJDEP 1983 Site Visit, discharges emanating from tenant Rona Pearl were observed entering the Pond. NJDEP noted that other BII tenants, which included Metropolitan Renderers and WCC, had also previously used this Pond to discharge wastewaters. CCA000049, CCA000058, CCA000059

In 1988, NJDEP assessed a $5,000.00 penalty against Rona Pearl for discharging approximately 3,000 gallons of untreated process water to the Platty Kill Canal, a tributary of the Kill Van Kull. DDA000010, DDD000001

Tenant--Co-Gen Technologies:

In 1994, Co-Gen notified NJDEP that a spill of PCB-contaminated transformer oil occurred at the Site, near the Boiler House. CCG000008, CCG000009

Tenant--Metropolitan Renderers Association:

As noted above, NJDEP observed in 1983 that Metropolitan Renderers was also using the separator pond to discharge its process wastewater. CCA000049, CCA000058, CCA000059

Sanitary Sewer:

BII/IMTT-Bayonne:

The City of Bayonne utilizes a combined sewer system ("CSS"). These types of systems commingle sanitary and storm water flow before it enters the regional sewage treatment plant. During periods of heavy precipitation, excess overflow is discharged through the combined sewers to the adjacent tidal waters, due to the lack of carrying capacity in the trunk lines and at the sewage treatment plant. BII was served by combined sewers which were part of the City of Bayonne CSS. CCG000005, CCG000011, CCH000001

The City of Bayonne constructed its primary sewage treatment plant, which is located at the foot of Oak Street, in 1954. BII later utilized its own on-Site wastewater treatment plant to treat process wastewater; however, it is believed that, prior to 1954, process wastewater from Site operations was discharged directly to the Kill Van Kull. BAJ000001, DDH000002

Tenant--White Chemical:

In 1977, samples collected from on-Site sewer lines, which discharge into the BII Pond, indicated contamination with PBB isomers. DDH000001

According to a 1979 EPA memo, construction workers complained about fumes while working on the sewer system, which conveys effluent from WCC. EPA concluded that the fumes may be due to free chlorine or free bromine, which could be present in the

effluent. DDH000001

Tenant--Southern California Chemical Co.:

Tenant, SCC was documented by NJDEP to have discharged supernate into the Kill Van Kull, circa 1981. The mechanism for this discharge is unclear. DDC000007, DDC000008

Storm Sewer:

BII/IMTT-Bayonne:

In 1973, BII indicated that stormwater discharges from the Site flowed through a storm sewer leading to the Kill Van Kull. CCA000009

The plant utilized fresh water from the City of Bayonne to generate steam. The condensate that was not returned to the boiler house was discharged into the PKC. Plant cooling waters also discharged via the storm sewer to the Kill Van Kull. CCA000008, CCA000009

In 1995, NJDEP observed that the facility's stormwater discharges were commingled with heavily contaminated groundwater, which consisted of floating product, VOCs, tank and line test washout waters, and tank bottom waters. NJDEP reported that the contaminated groundwater discharged to stormwater drains and seeped into the PKC. NJDEP also observed that the banks of the PKC were black stained, devoid of vegetation, and saturated with oil. DDA000001, DDA000010

NJDEP site visits conducted in 1995 reported that volatile product was entering the storm sewer line, creating a toxic gas, and migrating to the Kill Van Kull, creating a 600 foot – 800 foot sheen along the shoreline. CCA000025

BII's consultant, Bluestone Environmental Services, noted the existence of storm sewers in various Yards at the Site. Some of these sewers were reported to have been combined with the process sewer system. CCG000003

An NJDOT storm sewer was located on-Site. This sewer flowed to the Kill Van Kull and was closed in about 2000. It was not clear from the case files if this was the same storm sewer as the one identified on-Site by BII in 1973. CAA000018, CCG000005

In 2003, stormwater was observed discharging into the Platty Kill Pond via a 36-inch sewer pipe that was historically thought to be plugged. This additional, un-permitted source of stormwater caused the Pond to overflow into the PKC. Low levels of contaminants were detected in the storm flow. CCA000019, CCA000035, CCG000010

Tenant--White Chemical:

In 1987, WCC conducted soil sampling at former operational areas of the site. The analytical results indicated extensive contamination with organics, metals, cyanides, phenols, petroleum hydrocarbons, brominated phenols and pesticides. DDH000001

Sediments collected from catch basins and storm sewer structures revealed concentrations above cleanup criteria for the following substances:

- Pentachlorophenol up to 30,900 ppb (USEPA Class I Pesticide associated with the formation of dioxin)
- Benzo(a)anthracene up to 18,000 ppb
- Benzo(b)fluoranthene up to 9,110 ppb
- Zinc up to 4,430 ppm
- Copper up to 1,380 ppm
- Arsenic up to 72 ppm
- Lead up to 3,370 ppm

These sewer structures, which consisted primarily of catch basins in and around the portion of the Site previously occupied by White Chemical, were sampled in 2005. The existence of these hazardous substances in sediments within the catch basins provides a historical record of the types of hazardous substances discharged via this system. These particular storm sewers discharged to the separator pond and to the PKC. CCG000004

Runoff:

BII/IMTT-Bayonne:

In 1977, NJDEP observed that the BII property, which fronts the Kill Van Kull, included a bulkhead. Buried pipes, no longer operational, had reportedly been removed from the Site. It is unclear as to what their original uses were for. NJDEP noted that a wooden structure served as a pollution barrier which was situated approximately 10 feet offshore of the bulkhead. Large quantities of oil and other pollutants reportedly were present within this containment area. The removal of oil-saturated soils behind the bulkhead area had also been observed. Of note, a City of Bayonne sewer line also emptied at this same location. CCA000004

NJDEP determined that the bulkhead had leached oily substances into the Kill Van Kull since 1977. NJDEP attributed a sheen on the water to the existence of the on-Site (settling/skimming) Pond. CCA000058, CCA000059

A 1988 CERCLA Site Investigation Report state:

> "[d]ue to the proximity of these water bodies and the presence of contamination throughout the entire Bayonne Industries complex, the potential exists for continued contamination of both the Platty Kill Creek and the Kill Van Kull via runoff, discharge to ground water, and release from sediments."

DDH000001

In 1991, NJDEP issued an "Unacceptable" notice to IMTT – Bayonne that noted stormwater runoff from the tank farm area. DDA000005

In 2004, approximately 51,000 gallons of sodium hydroxide leaked from a tank in Yard 1 over a period of 12 days. CCG000006

In August 2004, IMTT-Bayonne reported a spill of approximately 150,000 gallons of methanol, as a result of a tank valve being left open and the tank overflowing. DDA000013

In January 2005, IMTT-Bayonne reported a spill of a 4,400 gallons methyl methacrylate to a spill trench, as a result of a sheered valve on a loading rack. DDA000012

Numerous oil/gasoline and other product spills were noted by NJDEP (at least 37) to have occurred throughout the Site, as well as the on-Site presence of piles of oil-contaminated soil. CCA000011, CCG000003, CCG000007, DDA000010

Tenant: White Chemical:

It was noted in a 1988 EPA Preliminary Assessment that although previous analyses for dioxin have been inconclusive due to interferences from other contaminants, the potential existed for dioxin to be present, as "dioxin precursors" had been used at this site. DDH000001

A 1988 CERCLA Site Investigation Report noted:

> "[a]n NJDEP inspection on July 5, 1983 noted the existence of uncapped discharge pipes leading from the bromine tank farm. Spillage of product and raw materials were also noted throughout the facility. Drum washing took place on the facility and may have involved direct dumping on the ground or in potentially unlined troughs."

DDH000001

Tenant: Theobold Industries:

In 1978, NJDEP noted that some runoff from the BII tank farm drained to the PKC, via an unpermitted outfall operated by its tenant, Theobold Industries. CCA000014

Groundwater:

Bayonne Industries/IMTT:

In 1977 NJDEP noted that "[t]his facility has a severe ground water problem. CCA000004

Groundwater quality was evaluated between 1990 and 1992 for volatile organic compounds only. The following substances were most frequently found at levels above groundwater quality criteria:

- Benzene (up to 10.845 ppm)
- Total Xylenes (in excess of 1 ppm)
- Toluene*

- Vinyl Chloride*
- Chloroform*
- trans-1,2-Dichloroethene*

* Concentration levels not reported

CCG000003

Other references confirm that there is documented groundwater contamination in the area associated with oil and petroleum products that resulted from the Site's historical use as a petroleum refinery and storage facility. DDH000001

Groundwater depth across the Site ranges from 1 to 18 feet below grade, and generally flows to the south-southwest toward the Kill Van Kull, except in the immediate vicinity of the PKC. CCA000023, CCH000005

Tenant--White Chemical:

It was noted in a 1988 EPA Preliminary Assessment that although previous analyses for dioxin have been inconclusive due to interferences from other contaminants, the potential exists for dioxin to be present, as "dioxin precursors" have been used at this site. DDH000001

Tenant--Southern California Chemical Co.:

NJDEP noted in a 1981 inspection report that spillage from rotted drums at SCC's facility "probably contaminated the groundwater." It also noted that the facility had several spills of materials containing heavy metals from uncovered drums which could easily overflow and percolate pollutants into the groundwater. DDC000007

POTENTIAL NEXUS TO NEWARK BAY STUDY AREA (describe in detail; cite to supporting documentation; list CERCLA hazardous substances; and volume, if known):

Direct (e.g. pipe, outfall, spill):

BII/IMTT-Bayonne:

As indicated above, NJDEP noted in 1977 that the BII property, which fronts the Kill Van Kull, included a bulkhead. Buried pipes that were no longer operational had reportedly been removed from the Site. It is unclear as to what was the original use of the buried pipes. The potential for contaminated surface and groundwater to exit the Site and enter the Kill Van Kull, via these pipes, is likely. CCA000044.

ENSR noted in 1996 that BII maintained a continuous floating oil boom on the Kill Van Kull that was situated along the waterfront from Pier 4 to Pier 1. This control measure was implemented to minimize seepage of oil from the Site into the Kill Van Kull. Historic aerial photo interpretations indicated that as early as 1963 "possible" sorbent booms appeared at several locations along the PKC. "Floating product" appeared to be present on the surface of the pond. CCG000003

Sanitary Sewer (provide name and location of CSO; details regarding CSO overflows and dates):

BII/IMTT-Bayonne:

A 2005 inspection conducted by BII of its facility sewer system revealed the presence of various wood and cast iron sewers. This inspection noted infiltration at several joints of the wooden sewers, as well as the cast iron sewers. CCG000004, CCG00005

Storm Sewer (provide name and location of CSO; details regarding CSO overflows and dates):

BII/IMTT-Bayonne:

BII's consultant, Bluestone Environmental Services, noted that several active storm sewers existed throughout Yard 3. This yard faces the Pond and the PKC. CCG000003

Runoff:

BII/IMTT-Bayonne:

Due to the Site-wide contamination at the BII facility and the proximity of the PKC and the Kill Van Kull, NJDEP identified the potential for "continued" contamination of these waterways from run-off and ground water. DDH000001

A 1984 NJDEP Site Visit Report noted "[n]umerous oil spills throughout [the] site. Pile of oil contaminated soil still on site from spill which occurred 2 years ago." CCA000011

In 1988, a large gasoline spill occurred in the area of Tank 5214 due to a leaking tank. CCA000037, CCG000003

Tenant--Southern California Chemical Co.:

In a 1981 inspection report, NJDEP noted that "several 55 gallon metal drums [were] corroded and pitted with no bottoms…drums stored on their side have no tops and material poured onto soil." NJDEP also observed approximately 400, 55-gallon metal and plastic containers present at this facility. DDC000007

During an April 1981 hazardous waste investigation, NJDEP noted the "site is contaminated with past spills from loading and off loading operations and poor storage practices. The heaviest concentrations are of arsenic, lead, nickel, and chromium." DDC000008

Washwater utilized for the disassembly and clean-up of on-site tanks was collected in a concrete pit prior to disposal. It was discovered by USEPA that an alternate drain from the concrete pit was connected to a storm sewer. CCG000003

Tenant--Kenrich Petrochemicals:

In 1977, an accidental explosion occurred from a process chemical reaction, which caused burning chemicals to shoot into the air. It was reported in a newspaper media

report that chemicals boiled out of a small manhole cover. It was also noted in the same newspaper media report that the process operation involved the use of water, caustic soda and cumyl phenol. The release of these substances to groundwater is probable. DDE000002

Groundwater:

BII/IMTT-Bayonne:

In 1977, NJDEP noted "…that the ground water contamination is known to exist at the Bayonne Industries site due to its use for many years of handling petroleum products and That residual oil appears in the groundwater." CCA000054A

During the investigation of the 2004 sodium hydroxide spill (approximately 51,000 gallons) in Yard 1, a 1921 plot plan of the Site revealed a box sewer running directly along the west side of Yard 1 towards the Kill Van Kull. It was noted that the sewer seemed to have been abandoned at some time between 1921 and 1948. According to the consultant, Weston Solutions, "[t]he old sewer line shown on the west side of the tanks in the 1921 drawing was most likely abandoned in place, and may be acting as a conduit for migration of the 50% NaOH product and affected ground water towards the Kill Van Kull." CCG000011

Groundwater at the Site discharges to surface water and "may be impacting ecological receptors in the Kill Van Kull." CCH000003

Tenant--White Chemical:

According to regulatory file documents, "[t]he potential exists for contamination of the ground water due to operations at White Chemical." DDH000001

Tenant--Kenrich Petrochemicals:

In 1977, an accidental explosion occurred from a process chemical reaction, which caused burning chemicals to shoot into the air. It was reported in a newspaper media report that chemicals boiled out of a small manhole cover. It was also noted in the same newspaper media report that the process operation involved the use of water, caustic soda and cumyl phenol. The release of these substances to groundwater is probable. DDE000002

REFERENCES

TAB NO.	BATES NO.	DATE	DESCRIPTION
1	BAJ000001	12/29/82	*Application to the USEPA for Section 301(h) Modification of Secondary Treatment Requirements for Discharges to the Marine Waters of the Kill Van Kull for the Bayonne Sewage Treatment Plant* prepared by Hazen and Sawyer (excerpts)
2	CCA000001	01/07/99	NJDEP Waterfront Development Permit No. 0901-90-0003.6 Issued to BII

3	CCA000004	08/02/77	NJDEP Internal Memo Re: 7/27/77 Site Inspection
4	CCA000005	08/13/76	Letter from NJDEP to USEPA Re: Comments on NPDES Permit No. NJ0001341
5	CCA000006	08/03/76	NJDEP Internal Memo Re:7/29/76 Site Visit
6	CCA000007	06/25/76	Letter from Marshal Bratter, et al. to USEPA Re: Request for Extension of Comment Period for NPDES Permit No. 76-241 for White Chemical
7	CCA000008	1972	Department of the Army, Corps of Engineers Application for Permit to Discharge for BII
8	CCA000008A	10/16/72	Letter from BII to EPA Re: Permit Application No. 2SD OXW 2 000309
9	CCA000009	04/12/73	Letter from BII to NJDEP Re: Response to 4/2/73 NJDEP Letter
10	CCA000011	06/10/84	NJDEP Report of Visit
11	CCA000012	12/10/82	Letter from NJDEP to BII Re: NPDES Permit No. 0001341 Compliance Evaluation Inspection
12	CCA000014	08/11/78	NPDES Compliance Report
13	CCA000016	08/09/77	Letter from NJDEP to BII Re: Requirements for NPDES Permit No. 0001341
14	CCA000017	06/28/85	NJPDES Permit No. NJ0001341 Issued to BII (incomplete)
15	CCA000018	01/31/01	Letter from BII to NJDEP Re: Fourth Quarter Status Report for the Westside Waterfront Interim RA
16	CCA000019	01/2004	*Remedial Action Workplan Addendum, Platty Kill Pond Closure* prepared by Bluestone Environmental (excerpts)
17	CCA000021	07/1995	*Platty Kill Pond Bioremediation Project 1993/1994 Operating Season Report* prepared by ENSR (excerpts)
18	CCA000022	04/1996	*Platty Kill Pond Bioremediation Project 1995 Operating Season Report* prepared by ENSR (excerpts)
19	CCA000023	11/1995	*Platty Kill Canal Interim Remedial Action Report Volume I* prepared by ENSR
20	CCA000025	08/17/95	NJDEP Internal Memo Re: BII Site Visit
21	CCA000029	08/15/94	NJDEP Internal Memo Re: Review of Final Remedial Investigation Workplan dated June 1994
22	CCA000034	04/23/98	NJDEP Internal Memo Re: Review of Platty Kill Canal Phase II Sediment Investigation Report dated 3/25/98
23	CCA000034A	05/27/92	Memorandum of Agreement between NJDEP and BII
24	CCA000035	02/06/03	Report from IMTT Bayonne to NJDEP Re: NJPDES Permit No. NJ0002089 – Unpermitted Discharge
25	CCA000036	03/14/03	NJDEP letter to IMTT Re: Conditional Approval of 1999 RA and 2001 RIR
26	CCA000037	10/24/03	NJDEP Internal Memo Re: Review of Free Product Investigation Work Plan dated Nay 2003
27	CCA000039	08/26/02	NJDEP Internal Memo Re: Platty Kill Pond-Letter Report on Test Borings for Sheet Pile Barrier
28	CCA000041	02/14/02	NJDEP Internal Memo Re: 8/22/01 RIR Addendum and 9/26/01 Hot Spot Delineation
29	CCA000042	05/04/01	NJDEP Internal Memo Re: Review of 4/11/01 Revised "Hot Spot" Definition

30	CCA000043	11/04/00	NJDEP Internal Memo Re: RI for Sampling Clay-Till (incomplete)
31	CCA000044	04/10/00	NJDEP Internal Memo Re: Remedial Action Selection Report, Platty Kill Pond
32	CCA000047	03/05/98	*Platty Kill Canal Phase II Sediment Investigation Report*
33	CCA000049	07/01/85	*Site Inspection Report and Hazardous Ranking System Model for BII* prepared by NUS for USEPA (excerpts)
34	CCA000050	05/25/84	*EPA Potential Hazardous Waste Site Preliminary Assessment, Part 1* for BII (incomplete)
35	CCA000053	10/24/84	Letter from Weston to NJDEP Re: Separator Pond Closure Plan
36	CCA000054	02/11/81	NJDEP Waterfront Development Permit
37	CCA000054A	12/07/77	Letter from NJDEP to BII transmitting Certification Approval Application No. S-Ind-R-77-3-3 for the Construction & Operation of a Wastewater Treatment Plant
38	CCA000055	05/17/83	NJDEP Internal Memo Re: Addition of Bayonne Industries to the NJ Hazardous Waste Site List
39	CCA000058	04/12/83	NJDEP Internal Memo Re: 4/7/83 Site Visit-Proposed Closure Plan of Former Oil/Water Sludge Pond
40	CCA000059	01/19/81	NJDEP Internal Memo Re: Proposed Closure Plan of Former Oil/Water Sludge Pond
41	CCA000063	11/1996	Excerpt from the ENSR Phase I RI Report for BII
42	CCA000065	04/04/84	Letter from BII to NJDEP Re: NPDES Permit No. NJ001341
43	CCA000068	09/21/83	Letter from USEPA to BII Re: Delinquent Self-Monitoring Report
44	CCA000077	10/08/82	Letter from BII to NJDEP Re: Effluent Sampling Results
45	CCA000078	12/29/81	NJDEP Internal Memo Re: 10/30/81 Site Visit
46	CCA000079	04/02/96	*Platty Kill Canal Phase 2 Sediment Investigation Plan Letter* prepared by ENSR
47	CCB000002	11/14/06	D&B Report for Bayonne Industries, www.dnb.com
48	CCB000004	02/21/09	Hoover's Report for Bayonne Industries, Inc.
49	CCB000006	02/18/09	NJ Business Entity Status Report for Bayonne Industries, Inc., https://accessnet.state.nj.us
50	CCB000007	02/18/09	Corporate Detailed Record for International Tank Bayonne, Inc., http://www400.sos.louisiana.gov
51	CCB000008	02/18/09	NJ Business Entity Status Report for International Tank Bayonne, Inc.
52	CCB000009	03/03/09	Corporate Detailed Record for ITT-Storage, Inc., http://www400.sos.louisiana.gov
53	CCB000010	02/18/10	Corporate Detailed Record for International Tank Terminals, LLC. , http://www400.sos.louisiana.gov
54	CCB000011	02/25/09	Corporate Entity Details for IMTT Holdings Inc., https://sos-res.state.de.us
55	CCB000012	02/25/09	Corporate Detailed Record for IMTT Holdings Inc., http://www400.sos.louisiana.gov

56	CCB000013	02/25/09	Corporate Detailed Record for ITT-BT Partner, Inc., http://www400.sos.louisiana.gov
57	CCB000014	02/25/09	Corporate Detailed Record for Bayon of LA, Inc., http://www400.sos.louisiana.gov
58	CCB000015	02/25/09	Corporate Detailed Record for Bayonne Terminal Partnership, http://www400.sos.louisiana.gov
59	CCB000016	03/03/09	Corporate Detailed Record for ITT-Bayonne Storage, Inc., http://www400.sos.louisiana.gov
60	CCB000017	03/03/09	Corporate Entity Details for International-Matex Tank Terminals, https://sos-res.state.de.us
61	CCB000018	03/03/09	Corporate Detailed Record for International-Matex Tank Terminals, http://www400.sos.louisiana.gov
62	CCB000019	02/18/09	Corporate Entity Details for International Tank Terminals, https://sos-res.state.de.us
63	CCB000020	02/18/09	Hoover's Report for International-Matex Tank Terminals
64	CCB000021	02/17/09	D&B Report for International-Matex Tank Terminals
65	CCB000022	02/17/09	D&B Report for Bayonne Industries Inc.
66	CCG000001	01/08/04	Letter from NJDEP to IMTT Re: 1992 MOA, 1999 RA, 2003 IWR, and 2003 SIR
67	CCG000002	10/21/03	NJDEP Internal Memo from Boyer to Kenney Re: Review of July 2003 SIR
68	CCG000003	04/2004	*Revised Site Investigation Report – Bayonne Industries* prepared by Bluestone Environmental. Includes portions of the 11/1996 *Phase I RI Report* prepared by ENSR (excerpts)
69	CCG000004	10/14/05	*Remedial Investigation Work Plan Quarterly Report No. 5* for BII Sewer Investigation
70	CCG000005	06/30/05	*Remedial Investigation Work Plan Quarterly Report No. 4* for BII Sewer Investigation (excerpts)
71	CCG000006	05/12/04	NJDEP Internal Memo Re: BII SIR and Free Product Investigation Workplan
72	CCG000007	02/2003	*Soil Reuse Plan for the Platty Kill Pond – Bayonne Industries* prepared by Bluestone Environmental.
73	CCG000008	10/22/99	NJDEP Meeting/Site Visit Report – Bayonne Industries
74	CCG000009	12/17/99	Letter from NJDEP to BII Re: Review of the Cogeneration ISRA PA Report dated 1/29/99
75	CCG000010	01/21/03	Letter from BII to NJDEP Re: Un-permitted Storm Water Discharge to Platty Kill Canal
76	CCG000011	11/11/05	Letter from Weston to NJDEP transmitting Response to NJDEP Comments Concerning Sodium Hydroxide Release and Supplemental RIR (incomplete)
77	CCG000032	09/26/01	Letter from BII to NJDEP Re: Technical Modifications to the Platty Kill Canal, Hot Spot Delineation
78	CCG000034	12/30/02	Letter from NJDEP to IMTT-Bayonne transmitting Draft Surface Water Renewal Permit Action NJPDES Permit No. NJ0002089
79	CCG000041	04/20/06	Letter from NJDEP to Wolff & Samson Re: Applicability of ISRA in IMTT Stock Sale, includes 4/7/06 Applicability/Nonapplicability Affidavit

80	CCH000001	11/1979	*Evaluation of Control Alternatives for the Separator Pond* prepared by Weston (excerpts)
81	CCH000002	09/12/86	Letter from NJDEP to Beveridge & Diamond Re: Applicability of ECRA to Leases
82	CCH000003	12/1999	*Remedial Action Selection Report for the Closure of the Platty Kill Pond*
83	CCH000005	08/22/01	*Remedial Investigation Addendum Report, Sampling Clay-Till Platty Kill Canal* prepared by Bluestone Environmental (excerpts)
84	CCJ000001	01/10/56	Certificate of Incorporation of Bayonne Industries, Inc.
85	CCJ000002	05/11/56	Certificate of Amendment to Certificate of Incorporation of Bayonne Industries, Inc.
86	CCJ000003	07/30/56	Certificate of Amendment to Certificate of Incorporation of Bayonne Industries, Inc.
87	CCJ000004	01/12/07	NJ Dept of Treasury Certificate Relative to Corporate Filing – Bayonne Industries, Inc. Filed/Recorded a Certificate of Merger w Bayonne Terminal Warehouse Corporation on 7/24/84
88	CCM000002	04/12/07	Foreign Corporation Annual Report for IMTT Holdings Inc.
89	DDA000001	06/21/95	NJDEP Internal Memo Re: IMTT Bayonne Transfer of Permit No. NJ0001341
90	DDA000002	06/07/93	NJDEP Nonapplicability Form for International Tank Bayonne
91	DDA000003	01/18/89	NJDEP letter to IMTT Re: Compliance Evaluation Inspection
92	DDA000004	06/30/89	Letter from NJDEP to IMTT Re: Compliance Evaluation Inspection
93	DDA000005	04/23/91	NJDEP Discharge Surveillance Report
94	DDA000006	04/17/91	NJDEP Discharge Surveillance Report
95	DDA000007	04/17/91	NJDEP Notice of Violation
96	DDA000008	06/12/90	NJDEP Notice of Violation
97	DDA000010	07/2005	*Preliminary Assessment IMTT – West Side, Volume I* prepared by Bluestone Environmental
98	DDA000011	02/28/95	NJPDES Permit Renewal Application Direct Discharge to Surface Waters Permit # NJ0002089 for IMTT
99	DDA000012	01/31/05	NJDEP Investigation Report - Methyl Methacrylate Spill at IMTT
100	DDA000013	08/30/04	NJDEP Investigation Report - Methanol Spill at IMTT
101	DDB000001	04/02/93	EPA Notification of Regulated Waste Activity Exxon Bayonne Lubricants Plant
102	DDC000001	03/28/88	NJDEP Internal Memo Re: Status of SCC
103	DDC000002	07/14/87	NJDEP Internal Memo Re: Site Inspections for Closed TSD Facilities
104	DDC000003	09/30/85	NJDEP RCRA Evaluation Form for SCC
105	DDC000004	Undated	RCRA Inspection Report Fact Sheet for SCC
106	DDC000005	07/29/83	NJDEP Internal Memo Re: Closure of RCRA Part A TSD Facilities
107	DDC000006	05/04/81	NJDEP Internal Memo Re: SCC Soil Samples
108	DDC000007	03/24/81	NJDEP TSD Inspection Report for SCC

109	DDC000008	04//10/81	NJDEP Hazardous Waste Investigation Report for SCC
110	DDD000001	04/21/88	Article: "State fines Pearl firm for polluting," Jersey Journal
111	DDD000002	1985	MacRae's Industrial Directory for New Jersey (excerpts) – Rona Pearl
112	DDD000003	1990	MacRae's Industrial Directory for New Jersey (excerpts) - Rona Pearl
113	DDE000001	05/08/80	Article: "Bayonne chemical explosions injure 2 workers," Bayonne Environmental Pollution – Kenrich Petrochemicals
114	DDE000002	08/27/77	Article: "3 badly burned in Bayonne," newspaper unknown - Kenrich Petrochemical
115	DDE000003	11/19/81	Letter from NJDEP to USEPA Re: NJDEP Discharge Certification for Federal Application No. NJ0003018 for Kenrich Petrochemicals
116	DDF000001	11/25/66	Article: "Theobold Sells Bayonne Plant to Concern from Minneapolis," Bayonne Times
117	DDF000002	09/21/66	Article: "Theobold Firm Gets US Pact," Bayonne Times
118	DDG000001	05/10/71	Memo from F. Ulrich to A. Mytelka Re: Metropolitan Renderers Association Industrial Survey
119	DDH000001	10/1988	*CERCLA Site Investigation Report – White Chemical Corporation, Volume I of II* , includes USEPA Preliminary Assessment (excerpts); contains some pages marked "Confidential," source: NJDEP files
120	DDH000002	01/1979	*Hudson County Utilities Authority 201 Wastewater Facilities Plan, Planning Area II, Volume I-Regional Inventory* prepared by Malcolm Pirnie (excerpts)
121	DDH000003	Undated	NJDEP Site Status Reports Publication - White Chemical (excerpts)
122	DDH000004	10/13/89	White Chemical Chapter 11 Bankruptcy Filings – NJ Bankruptcy Court, Superior Information Database Search Results
123	DDH000005	06/26/80	Hudson Regional Health Commission Report of Field Investigation – White Chemical Spill

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DEC 29 1982
INTERSTATE SANITATION
COMMISSION

APPLICATION
TO
THE U.S. ENVIRONMENTAL PROTECTION AGENCY
FOR
SECTION 301(h) MODIFICATION
OF SECONDARY TREATMENT REQUIREMENTS
FOR DISCHARGES TO THE MARINE WATERS
OF KILL VAN KULL FOR
THE BAYONNE SEWAGE TREATMENT PLANT

BY

THE CITY OF BAYONNE, NEW JERSEY

KENNETH J. RAKOWSKI, P.E.
MUNICIPAL ENGINEER

DENNIS P. COLLINS
MAYOR

DECEMBER 29, 1982

PREPARED BY

HAZEN AND SAWYER, P.C.
NEW YORK, N.Y.

BAJ000001

CITY OF BAYONNE
OFFICE OF THE CITY ENGINEER
MUNICIPAL BUILDING
630 AVENUE "C"
BAYONNE, NEW JERSEY 07002

29 December 1982

Ms. Jacqueline F. Schafer
Administrator
USEPA - Region II
26 Federal Plaza
Room 900
New York, New York 10007

301(h) Application for Modification
of NPDES Permit for the Bayonne
Sewage Treatment Plant

Dear Ms. Schafer:

The City of Bayonne is pleased to submit herewith the original and one copy of the Application for Modification of its NPDES permit under Section 301(h) of PL 97-117 for The Bayonne Sewage Treatment Plant.

As discussed in Section I, based on currently available data and with the proposed "improved discharge" outfall with diffusers, it is estimated that all of the water quality requirements will be met by the Bayonne Sewage Treatment Plant effluent discharge in the Kill Van Kull.

We request that the proposed Plan of Study presented in Section III be approved so that we can proceed with the survey work and additional documentation required to demonstrate compliance with Section 301(h) of PL 97-117.

Very truly yours,

CITY OF BAYONNE

Kenneth J. Rakowski, P.E.
Municipal Engineer

cc: w/copy of Application
USEPA - Office of Marine Discharge Evaluation, Washington, D.C.
NJDEP - Commissioner Robert E. Hughey
ISC - Director Thomas R. Glenn

CITY OF BAYONNE
OFFICE OF THE CITY ENGINEER
MUNICIPAL BUILDING
630 AVENUE "C"
BAYONNE, NEW JERSEY 07002

December 29, 1982

CERTIFICATION

For

Application for Modification of NPDES
Permit Under Section 301 (h) of PL97-117

For

The Bayonne Sewage Treatment Plant

I certify under penalty of law that I have personally examined and am familiar with the information submitted in the attached documents, and based on my inquiry of those individuals immediately responsible for obtaining the information, I am convinced that the information is true, accurate and correct. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Kenneth J. Rakowski, P.E.
Municipal Engineer

HAZEN AND SAWYER, P.C.
ENGINEERS

360 LEXINGTON AVENUE · NEW YORK, N.Y. 10017 · (212) 986-0033

December 29, 1982

Mr. Marvin Eger
Director
Department of Finance
City of Bayonne
630 Avenue C
Bayonne, New Jersey 07002

301(h) Application for Modification of NPDES Permit for the Bayonne Sewage Treatment Plant

Dear Mr. Eger:

Hazen and Sawyer is pleased to transmit the attached Application for Modification of the requirements of secondary treatment at the Bayonne Sewage Treatment Plant. This application is prepared under Section 301(h) of the Clean Water Act (PL 97-117), which provides for a modified NPDES permit with less than secondary treated municipal effluent to be discharged to marine waters. This Application is prepared as per our Agreement dated October 13, 1982, Phase I, Initial Application.

Based on the currently available data on the water quality of Kill Van Kull and the proposed "improved discharge" outfall extention and diffuser, it is estimated that all of the water quality requirements of Section 301(h) will be met by the Bayonne Sewage Treatment Plant effluent.

We recommend that the City of Bayonne proceed with the 301(h) Modification Application and request EPA approval of the Plan of Study so that Phase II of our contract to submit additional information can be expedited.

We wish to thank you for the opportunity to prepare this Application and particularly Mr. Fred James for his cooperation and valuable assistance in preparation of this Application. This Application was prepared by Dals Chaudhary under the direction of Dr. Barry Berdahl of our staff.

Very truly yours,

HAZEN AND SAWYER, P.C.

Jerry Lastihenos

Jerry Lastihenos, P.E.
Vice President

JL:fg
Attachment

BAYONNE 301(h) APPLICATION

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SECTION I. EXECUTIVE SUMMARY

The City of Bayonne wastewater management facilities include 78 miles of combined sewers and a 21 mgd primary treatment plant which was constructed in 1954. The current flow to the Bayonne Sewage Treatment Plant (STP) is 11.9 mgd and removals are about 40 percent of BOD_5 and 50 percent of suspended solids. The design flow for the Bayonne service area as projected by the Hudson County Utilities Authority 201 Facilities Plan is 11.0 mgd.

The Bayonne STP discharges treated effluent into Kill Van Kull via a 1350 ft. long 68" x 68" concrete outfall. The Kill Van Kull is a saline estuary within the New York Harbor estuary, which connects Upper New York Bay and the Newark Bay. The Kill Van Kull is a navigational channel about 4 miles (6.4 km) long and 1000 to 2000 feet (300 to 600 m) wide, and is maintained at a depth of 35 feet (10.5 m) from mean low water (MLW).

As discussed in Section IIA of this Application, the present outfall is a single outlet outfall with discharge at surface level (0.0) in the Kill Van Kull. As part of the "improved discharge", this outfall will be extended by 476.5 feet, the maximum possible without interference with navigational functions of the channel. The proposed outfall extension includes a 72" main diffuser section with fifteen 20-inch diameter laterals, each connected to two 12-inch diameter outlet ports. Details of the diffuser are given in Exhibit IIA-5. With the "improved" outfall discharge, the available dilution is estimated to be 100:1 at the design average effluent flow of 11 mgd and 40:1 at a peak wet weather effluent flow of 22 mgd.

The following paragraphs briefly describe how the Bayonne STP "improved discharge" will meet the requirements of Section 301(h):

40 CFR 125.60: Existence of and Compliance with Applicable Water Quality Standards.

The applicable water quality standards for the Study Area waters include the New Jersey DEP classification of TW-3 waters and Interstate Sanita

tion Commission (ISC) classification of B-2 waters. Both standards require a minimum dissolved oxygen level of 3 mg/l in the Kill Van Kull Channel. For details of other water quality parameters see Section IID. Dissolved oxygen (DO) concentrations are lowest during the summer period due to lower saturation values for oxygen solubility in water at high temperatures. Bacterial activity is also increased by high summer temperatures which results in decreased DO levels in the receiving waters. Frequency analysis of summer 1974-1976 DO data by the NYC 208 Study showed that about 25 percent of the DO values for the Kill Van Kull area were below the minimum standard of 3.0 mg/l. The Interstate Sanitation Commission (ISC) noted an improvement in the summer of 1982 DO concentrations in the Kill over previous years. The ISC Kill Van Kull-U.S. Gypsum monitoring station met the 3.0 mg/l DO requirements 95.7, 96.8 and 94.2 percent of the time in the months of July, August and September, 1981, respectively. DO standards were met 100 percent of the time from October 1980 through June 1981 (ISC, 1982 Summary). Based on the currently available data and with the proposed "improved" outfall with diffuser, it is estimated that all of the water quality requirements will be met by the Bayonne STP effluent discharge in the Kill Van Kull.

40 CFR 125.61: <u>Attainment or Maintenance of Water Quality which Assures Protection of Public Water Supplies, a Balanced Indigenous Population of Shellfish, Fish and Wildlife and Recreational Activities in and on the Water.</u>

Modifying of the NPDES permit will not interfere with the attainment or maintenance of the present water quality. The water has not been nor will be used as a public water supply. Since the "improved discharge" will in fact be an improvement over the present available dilution, none

of the recreational activities will be affected adversely. The determination on Balanced Indigenous Population (BIP) will be made based on additional data to be collected as outlined in the proposed Plan of Study (Section III).

40 CFR 125.62: Establishment of a Monitoring Program.

The proposed monitoring program is described in Section IIIF. The program basically contains a sampling and analysis program similar to that carried out to determine the baseline information presented in this Application. Special emphasis will be given on monitoring the most critical areas and seasons to maximize the ability to determine changes which may be associated with the modified discharge.

40 CFR 125.63: Effect of Discharge on Other Point and Non-Point Sources.

Based on the limited currently available data, it is estimated that there will be no additional treatment or control requirements for any other point or non-point sources. The initial dilution ratio of 100:1 will be greatly increased by the time the waters in the Kill Van Kull enter the New York Harbor. This will be further documented as described in the proposed Plan of Study.

40 CFR 125.64: Toxics Control Program.

Currently available data is not sufficient to provide information on the toxic control program. Additional information will be obtained and evaluated as detailed in the proposed Plan of Study.

40 CFR 125.65: Increase in Effluent Volume or Amount of Pollutants Discharged.

The proposed "improved discharge" will not result in an increase in effluent volume or the amount of pollutants discharged to the receiving waters.

SECTION II. GENERAL INFORMATION AND BASIC DATA REQUIREMENTS

A. Treatment System Description

1. Are you applying for a modification based on a current discharge, improved discharge, or altered discharge as defined in 40 CFR 125.58? (40 CFR 125.59 (a))

The City of Bayonne, New Jersey is requesting a 301(h) modification for the Bayonne Sewage Treatment Plant (STP) based upon an "improved discharge" to the Kill Van Kull Channel connecting Newark Bay and Upper New York Bay.

The present Bayonne STP is a primary treatment facility discharging through a 1350 ft. long 68" x 68" outfall extending to the pierhead line of Kill Van Kull. This single outlet discharge will be improved by extending the outfall by 476.5 ft. into the Kill and providing an outfall diffuser pipe for better dispersion and dilution.

2. Description of the Treatment/Outfall System (40 CFR 125.61(a) and 125.61(e)).

a. Description of the proposed treatment system

The proposed treatment system for the Bayonne STP includes maintaining of the existing primary treatment plant and extension of the existing outfall by 476.5 feet with a diffuser section.

The Bayonne Sewage Treatment Plant is located at the easterly end of Oak Street in the City of Bayonne. The location of the treatment plant and outfall are shown in Exhibit IIA-1. The Bayonne STP includes the treatment processes of screening, aerated grit removal. primary settling and effluent disinfection. Exhibit IIA-2 tabulates the projected waste loads in the year 2003, as estimated in the Hudson County Utilities Authority's (HCUA) 201 Facilities Plan for the Bayonne Area. The treatment system schematic is given in Exhibit IIA-3 and treatment components are tabulated in Exhibit IIA-4. The primary sludge is dewatered on the vacuum filters, using ferric chloride and lime conditioning. The dewatered cake will continue to be trucked for land disposal at the City's landfill site.

b. Proposed outfall configuration and location

The present plant outfall is about 1,350 feet long, extending to the pierhead line of Kill Van Kull. The outfall is a 68-inch reinforced concrete pipe. This outfall will be extended by approximately 476.5 feet from the present pierhead line using a 72-inch diameter reinforced concrete pipe and outfall diffuser to discharge "improved effluent" into Kill Van Kull (Exhibit IIA-5).

The proposed outfall location is 40° 38' 50" North, 74° 06' 52" West in the Kill Van Kull.

c. Current treatment system and outfall configuration

The Bayonne STP currently treats an average flow of 11.9 mgd with primary treatment. Present plant performance data are given in Exhibit IIA-6. An annual average plant effluent BOD_5 and TSS are 140 mg/l and 66 mg/l, respectively. Maximum monthly average plant effluent BOD_5 is 171 mg/l and effluent suspended solids are 91 mg/l.

The present plant outfall is a 68" by 68" reinforced concrete pipe, 1,350 feet long, extending up to the pierhead line of Kill Van Kull (see Exhibit IIA-7). The outfall location is 40° 38' 57" North, 74° 06' 55" West in the Kill Van Kull.

3. Effluent Limitations and Characteristics (40 CFR 125.60(b) and 125.61(e)(2)).

a. Final Effluent Limitations

The following final effluent limitations are proposed and requested for the Bayonne STP to be included in the section 301(h) modified NPDES permit.

	30 day mean	7 day mean
BOD_5 - mg/l	165	247
Suspended Solids - mg/l	140	210
pH - Units	between 6.0 and 9.0	

b. Current Discharge Characteristics

The primary treatment plant effluent characteristics during the period of October, 1981 to September 1982 were analyzed and various parameters are given in Exhibit

IIA-8. Only cadmium is listed in the NPDES permit for self-monitoring as the toxicant in the plant effluents, and reported values are included in Exhibit IIA-8. The current effluent is a primary effluent with BOD_5 in the range of 100 to 300 mg/l, and using the revised 301(h) technical support document, IDOD is estimated to be 3.0 mg/l.

4. Effluent Volume and Mass Emissions (40 CFR 125.61(e) (2) and 125.65(b)).

Based on the Hudson County Utilities Authority (HCUA) 201 Facilities Plan for Bayonne, the projected wastewater volume in the year 1988 would be 10.8 mgd and would increase to 11 mgd in the year 2003. The mass emissions of the "Improved" effluent are detailed in Exhibit IIA-9. The effluent volume and mass emissions are estimated for the years 1988 and 2003, rather than five year increments. for there is no significant increase in the projected effluent discharges.

5. Average Daily Industrial Flow (m^3/sec) (40 CFR 125.64(a))

During the HCUA 201 facilities study, an industrial waste load survey was conducted and the estimated industrial flows and loads during the years 1988 and 2003 are presented below.

	Industrial Wastes	
	1988	2003
Flow - mgd	2.2	2.4
BOD_5 - lbs/day	12,930	13,030
TSS - lbs/day	8,120	8,220

6. Combined Sewer Overflows (40 CFR 125.65)

The Bayonne wastewater collection system is combined sewer system with about 72 miles of combined sewers, about 6 miles of intercepter sewers and three pumping stations. There are no dry weather overflows from the system. During storm flows, 18 overflow regulators are available for combined sewer overflows. Out of 18 regulators, ten discharge to Newark Bay, three discharge to Upper New York Bay and five discharge to

Kill Van Kull. These CSO regulators are shown in Exhibit IIA-1 and their details summarized in Exhibit IIA-10.

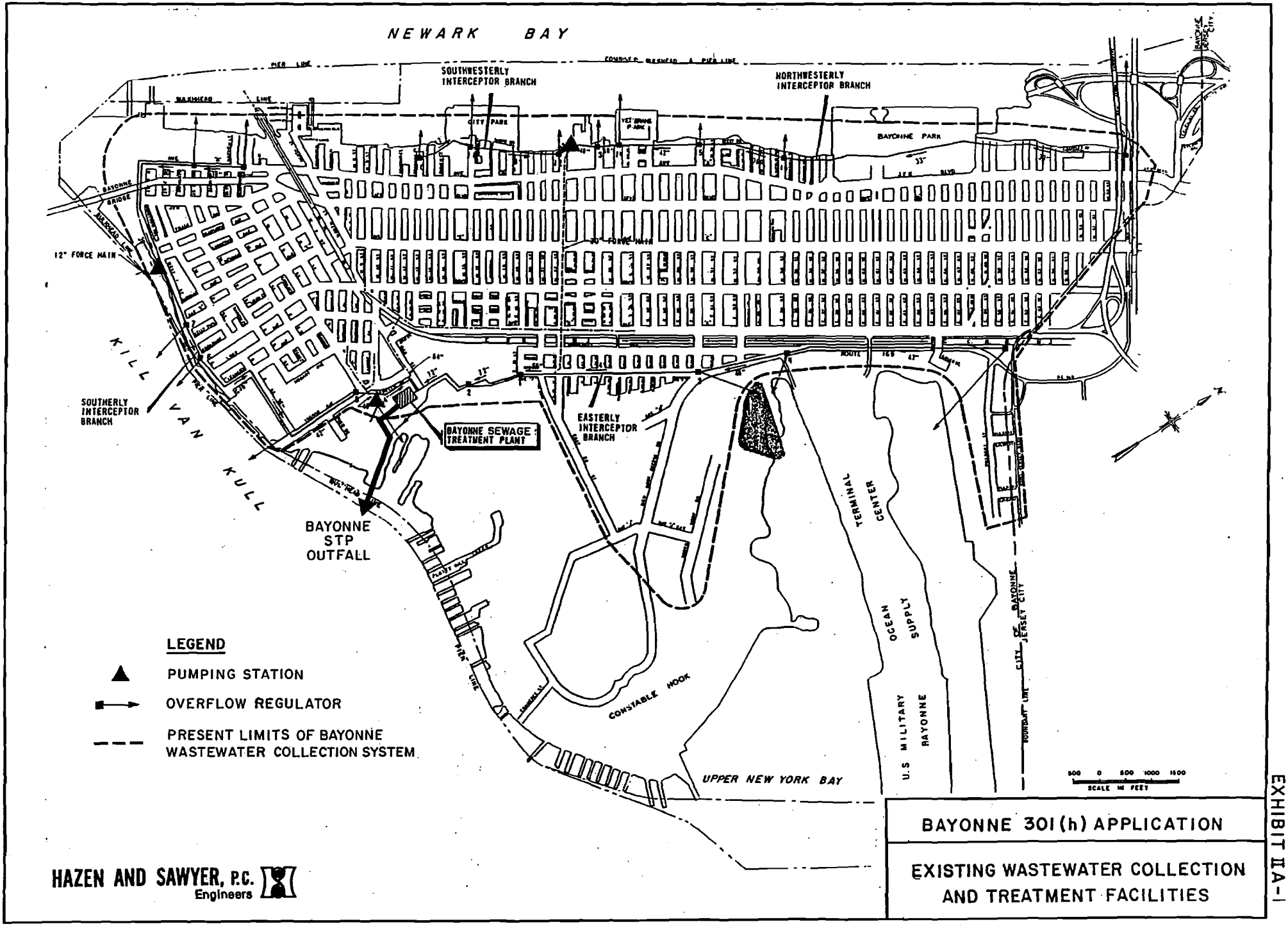
As part of the HCUA 201 study, a CSO study was made and the total waste loads from CSO are estimated as given below:

	Quantity per year	Average per day
Overflow volume-gallons	386,000,000	1,060,000
BOD_5 load - lbs	930,000	2,550
TSS load - lbs	7,200,000	19,720

The CSO study recommended a storm surge tank at the plant and rehabilitation of tide gates and regulators. These recommendations will be implementd as part of the "improved discharge" upgrading work.

7. Outfall/Diffuser Design. Provide the following data for your current outfall, and for the modified outfall, if different: (40 CFR 125.61(a)(1))

The current outfall for the Bayonne STP is 1,350 feet long and is 68-inch by 68-inch reinforced concrete pipe (Exhibit IIA-7). It discharges at the present pierhead line as a single outlet. The modified outfall includes extension of the present outfall by 476.5 feet long, 72-inch diameter RCP pipe with diffusers into the Kill Van Kull. The detailed sketch of the modified outfall is shown in Exhibit IIA-5.



HAZEN AND SAWYER, P.C.
Engineers

BAYONNE 301(h) APPLICATION

EXISTING WASTEWATER COLLECTION AND TREATMENT FACILITIES

EXHIBIT II A-1

BAYONNE 301(h) APPLICATION

EXHIBIT IIA-2

PROJECTED DESIGN LOADS (YEAR 1983 TO 2003)

	Upgraded Plant Design Loads (1)		
	Domestic	Industrial	Totals
Avg. Flow - mgd	8.60 (2)	2.40 (3)	11.0
BOD_5 - lbs/day	12,080	13,030	25,110
- mg/l	168	651	274
TSS - lbs/day	12,080	13,920	26,000 (4)
- mg/l	168	695	283
Max. flow - mgd	18.25	3.75	22.0

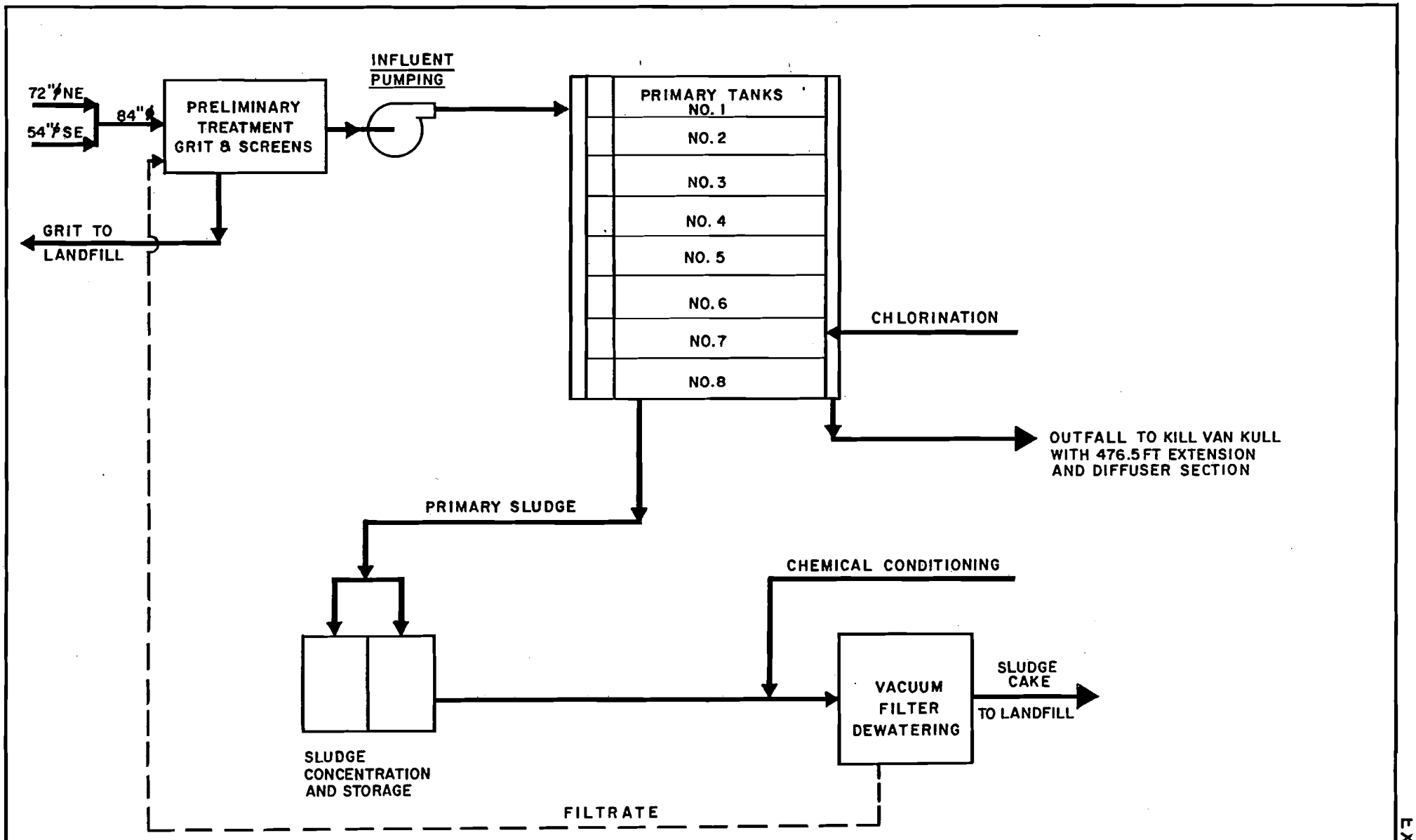
Notes:

(1) Based on the Hudson County Utilities Authority (HCUA) 201 Facilities Plan for Bayonne, Vol. 7, August 1979.

(2) Domestic flow is 4.1 mgd plus 4.5 mgd extraneous flow as given in the HCUA 201 Facilities Plan for Bayonne.

(3) Includes industrial load from municipal discharges and direct discharges.

(4) TSS design load adjusted for the quantity of grit solids estimated in the HCUA 201 Facilities Plan.



HAZEN AND SAWYER, P.C.
Engineers

BAYONNE 301(h) APPLICATION

PROCESS FLOW SCHEMATIC

EXHIBIT II A - 3

BAYONNE 301(h) APPLICATION

EXHIBIT IIA-4

TREATMENT SYSTEM COMPONENTS

1. Influent Sewer
   Size: 84 - inch diameter, reinforced concrete pipe
   Capacity: 80 mgd based on gravity flow.

2. Coarse Screening and grit facilities
   Screen Type: Mechanically cleaned with 3 inch clear opening coarse bar screens.

   Grit Chambers: One 15' wide by 45' long, aerated grit chamber. Two positive displacement blowers, each with 535 cfm capacity, 20 hp. Grit conveyor is bucket type and grit is hauled away to City's landfill.

3. Comminutor and fine screening
   Comminutor: presently out of service
   Fine Screen Mechanical bar screen with 1-1/2 inch clear openings. Presently manually cleaned as equipment is not functioning.

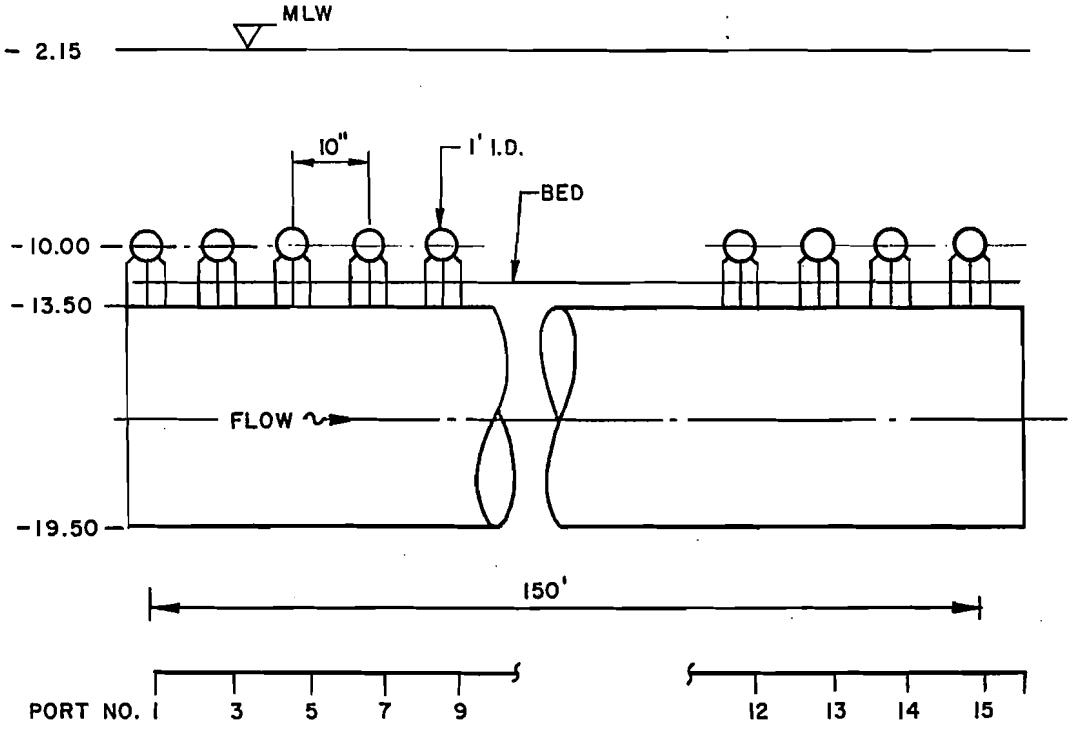
4. Influent Pumping Station
   Number of pumps: Four - 20 mgd pumps and two 10 mgd pumps.
   Pump Drives: One 20 mgd pump driven by a 175 hp variable speed drive electric motor; the remaining five pumps driven by gasoline engines.

   Flow metering: After pumping, flow is measured and recorded by a momentum - type meter with a rail mounted frame and a cable attached with a lead block in the flow channel.

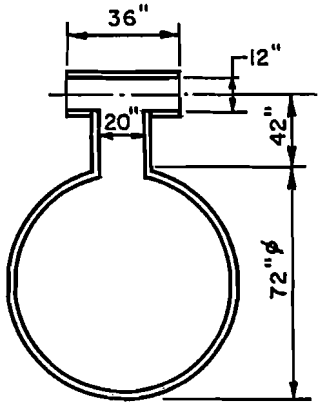
5. Primary Settling Tanks
   Type: Rectangular with chain and flight collectors
   Number: Eight tanks - (2 bays each)
   Size: 32 ft. wide x 110 feet long x 12.8 ft. SWD.
   Surface area: One tank - 3520 sq. ft.
   Eight tanks - 28,160 sq. ft.
   Design overflow: Present overflow - 422 gpd/sf at 11.9 mgd.
   Design overflow - 390 gpd/sf at 11 mgd.

6. Disinfection and Effluent Disposal
   Chlorination: Two gas chlorinators to be replaced by hypochlorite solution system.
   Outfall: The present outfall is a 68 inch x 68 inch RCP with 1350 feet length to the pierhead line and will be extended by 476.5 ft. with diffusers.
   Contact time: 39 minutes in the present outfall at an average flow of 11.8 mgd.
   55 minutes with extended outfall at 11 mgd.

7. Solids handling
   Sludge Conditioning: Lime added to primary sludge
   Dewatering: Two 350 square foot vacuum filters dewater to 20 to 25 percent cake solids.
   Disposal: The filter cake is transported by truck to the City of Bayonne landfill.



OUTFALL PIPE *



TYPICAL DIFFUSER PORT
CROSS-SECTION

* 72" RCP OUTFALL EXTENSION
FROM PRESENT 68"x 68"OUTFALL

BAYONNE 301(h) APPLICATION

HAZEN AND SAWYER, P.C.
Engineers

IMPROVED DISCHARGE
OUTFALL SCHEMATIC

BAYONNE 301(h) APPLICATION

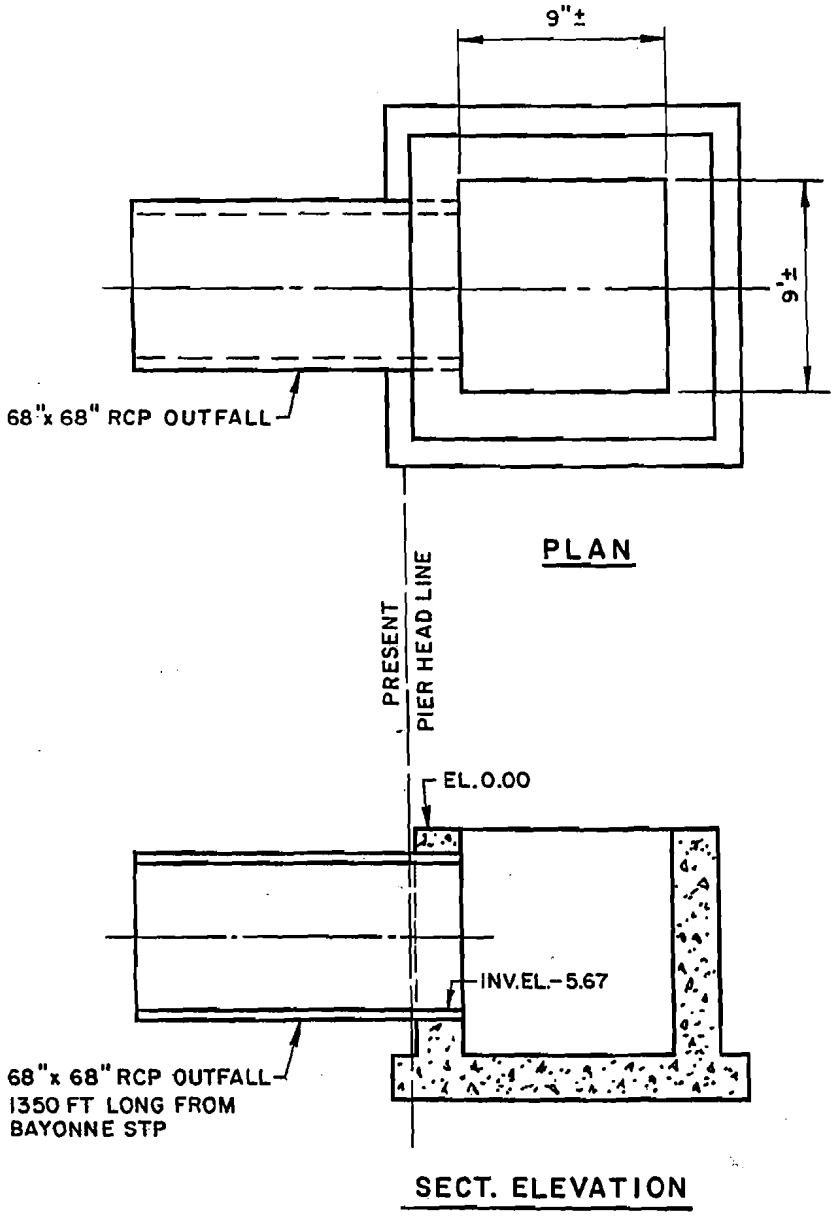
EXHIBIT IIA-6

PRESENT BAYONNE STP EFFLUENT

MONTHLY OPERATING DATA (10/81 to 9/82)

Month	Flow - mgd			pH		BOD_5 mg/l	TSS mg/l
	Mean	Max.	Min.	Max.	Min.		
9/82	9.6	14.0	7.2	8.3	6.2	110	91
8/82	11.6	20.3	9.5	7.9	6.3	150	60
7/82	12.3	22.2	9.5	8.4	6.4	130	75
6/82	14.0	19.2	10.5	8.1	6.0	144	58
5/82	12.7	18.2	9.3	8.0	6.0	171	64
4/82	14.1	22.8	9.8	7.9	6.4	129	71
3/82	10.4	20.8	8.2	8.1	6.5	145	68
2/82	10.5	15.3	8.1	8.5	6.5	155	56
1/82	12.6	37.2	8.4	8.5	6.0	127	57
12/81	10.5	20.3	8.1	9.0	6.0	139	68
11/81	11.1	19.3	6.7	7.5	6.0	153	45
10/81	13.4	30.0	8.4	8.9	6.0	117	76
Mean	11.9	-	-	-	-	140	66
Max.	14.1	37.2	10.5	9.0	6.5	171	91
Min.	9.6	14.0	6.7	7.5	6.0	110	45

EXHIBIT II A-7



BAYONNE 301(h) APPLICATION

PRESENT DISCHARGE
OUTFALL SCHEMATIC

HAZEN AND SAWYER, P.C.
Engineers

BAYONNE 301(h) APPLICATION

EXHIBIT IIA-8

CURRENT DISCHARGE CHARACTERISTICS

	Annual Average	Minimum	Maximum
Plant flow - mgd	11.8	9.6	37.2
BOD_5 - mg/l	140	110	171
TSS - mg/l	66	45	91
pH - Units	-	6.0	9.0
Cadmium - ug/l	15	5	40
IDOD - mg/l (1)	3.0	-	-

(1) Estimated using the revised 301(h) technical support document for primary effluent with BOD_5 in the range of 100 to 300 mg/l.

BAYONNE 301(h) APPLICATION

EXHIBIT IIA-9

PROJECTED EFFLUENT VOLUME AND MASS EMISSIONS

	1988	1993	1998	2003
Population	71,027	71,027	71,027	71,027
Flow - mgd	Effluent Volume			
- Residential	4.1	4.1	4.1	4.1
- Non-excessive I/I	4.5	4.5	4.5	4.5
- Industrial	2.2	2.3	2.4	2.4
Total	10.8	10.9	11.0	11.0

	Mass Emissions	
	Annual Average	Monthly (30 Day) Average
BOD- mg/l	140	165
- lbs/day	12,845	15,137
SS - mg/l	100	140
- lbs/day	9,174	12,844
pH - Units	6 to 9	6 to 9

BAYONNE 301(h) APPLICATION

EXHIBIT IIA-10

DETAILS OF COMBINED SEWER OVERFLOW REGULATORS

NPDES Permit Discharge No.	Regulator No.	Location	Outfall Size (inches in diam.)	Receiving Waterway
004	1.	E. 19th St. & Ave. F	42	Kill Van Kull
005	2.	Opposite E. 15th St.	54	Kill Van Kull
006	3.	E. 30th St. & Ave. F	30	Upper N.Y. Bay
007	4.	E. 34th St. & Rte. 169	72	Upper N.Y. Bay
008	5.	Ingham Ave. & E. 5th St.	60	Kill Van Kull
009	6.	Broadway & E. 1st St.	24	Kill Van Kull
010	7.	Ave. C & W. 1st St.	24	Kill Van Kull
011	8.	Ave. A & W. 3rd St.	24	Newark Bay
012	9.	Ave. A & W. 5th St.	24	Newark Bay
013	10.	Edwards Court	12	Newark Bay
014	11.	W. 16th St.	24	Newark Bay
015	12.	W. 22nd St.	36	Newark Bay
016	13.	W. 24th St.	16	Newark Bay
017	14.	W. 25th St.	36	Newark Bay
018	15.	W. 30th St.	18	Newark Bay
019	16.	Lincoln Parkway	36	Newark Bay
020	17.	Kennedy Blvd., vicinity of W. 59th St.	36	Newark Bay
021	18.	E. 50th St.	48	Upper N.Y. Bay

B. Receiving Water Description

1. Are you applying for a modification based on a discharge to the ocean or to a saline estuary (40 CFR 125.58(r))? (40 CFR 125.59(a)).

The Bayonne modification application is based on a discharge to a saline estuary. Kill Van Kull is a tidal estuary connecting Newark Bay and the Upper New York Bay sections of New York harbor. Salinity in the Kill Van Kull water ranges from 17.4 to 22.5 parts per thousand (ppt).

2. Is your current discharge or modified discharge to stressed waters? If yes, what are the pollution sources contributing to the stress? (40 CFR 125.61(f)).

Based on the limited available data, the "improved discharge" to the Kill Van Kull is not to stressed waters. Final determination will be made based on additional survey data to be collected as detailed in the proposed Plan of Study.

3. Provide a description and data on the seasonal circulation patterns in the vicinity of your current and modified discharge (40 CFR 125.61(a)).

a. Current Patterns

The tides throughout the New York Harbor waterways are of the semi-diurnal type with diurnal inequalities in the elevation of the two high waters and two low waters. These occur in approximately one lunar day, which is 24 hours and 50 minutes long. The largest tidal ranges, referred to as spring tides, occur twice every 28 days when the moon is either new or full. The smallest tidal ranges, neap tides, occur when the moon is in quadrature with the sun, i.e., half moon. The tide heights and time differences relative to the Battery are given in Exhibit IIB-1.

The magnitude and direction of the tidal currents throughout New York Harbor waters are shown in Exhibits IIB-2 through IIB-13. Velocities shown are for the near surface layers of these waters during spring tides. These current speeds are proportional to

the tidal range. During extreme neap tides with tide height ranges of less than three feet, the speeds shown in this series of maps are reduced by nearly 50 percent.

Exhibits IIB-2 through IIB-7 show the surface current patterns in New York Harbor for the time of the occurrence of high water at the Battery and at one, two, three, four, and five hours after high water at the Battery. In Exhibit IIB-2, we find as expected for a progressive wave that the maximum flood current, 3.9 cm/sec (1.8 kt), is obtained in the Hudson off the Battery. Conversely, at the mouth of the Kill Van Kull, the current is close to zero, i.e., at high water slack, and high water was obtained at this point about 1/2 hour before high water at the Battery. The currents in Newark Bay are in the last portion of the flood, while in the Hackensack and Passaic Rivers, the flood currents are still running close to their maximum speeds.

One hour after high water at the Battery, Exhibit IIB-3, the following features of the current pattern are found:

(a) The waters throughout Newark Bay are at high water slack.

(b) The northern end of the Arthur Kill is still flooding while the ebb in the Kill Van Kull has become established.

(c) The currents in Upper Bay and the Hudson continue to flood.

Two hours following high water at the Battery, Exhibit IIB-4, the ebb has begun in Newark Bay and the Passaic River. The Kill Van Kull is ebbing strongly while high water slack occurs in the Arthur Kill off Elizabethport. In Upper Bay, the currents are weakly ebbing and the discharge through the Kill Van Kull is directed seaward. It is apparent that the ebb discharge from the Kill Van Kull during approximately the first two hours of its ebb phase is moved northward into Upper Bay by the prevailing flood currents outside the entrance to the Kill. For the remaining four hours of the ebb within the Kill Van Kull (Exhibits IIB-5 through IIB-8), the discharge through the Kill is swept towards the ocean by the increasingly strong ebb currents in Upper Bay. During this same time interval, the ebb currents in Newark Bay attain their maximum values at about 4 hours after high water at

the Battery, and the ebb discharge from the Bay enters both the Kill Van Kull and the Arthur Kill.

By the time low water at the Battery is attained, Exhibit IIB-8, the ebb has nearly ended in the Kill Van Kull, while in Upper Bay, Newark Bay, and the Arthur Kill the ebb is still running. In the Hudson River off the Battery, the maximum ebb current is attained. In Exhibit IIB-9, the flood current has been established throughout the Kill Van Kull, but Newark Bay continues to ebb weakly and there is still ebb current in the Arthur Kill off Elizabethport. The Arthur Kill at this stage of the tide is receiving waters from both the ebb discharge in Newark Bay and the flood discharge through the Kill Van Kull. The waters entering the Kill Van Kull are derived from the northern portion of Upper Bay above Constable Hook since Upper Bay and the Hudson River are still ebbing. This condition continues for at least two hours after the beginning of the flood currents in the Kill Van Kull (Exhibit IIB-10). It is only during the last four hours of the flood currents in the Kill Van Kull that the inflowing waters are derived from areas south (or seaward) of the entrance to the Kill.

In Exhibit IIB-10, two hours after low water at New York, there are strong flood currents within the Kill Van Kull, while off Elizabethport in the Arthur Kill, low water slack occurs. Consequently, the only source of water during the first hour of flood in Newark Bay is the Kill Van Kull. During the subsequent hours of the flood tide in Newark Bay, water is drawn from both the Kill Van Kull and the Arthur Kill as shown in Exhibits IIB-11 through IIB-13.

The variations of salinity over a complete tidal cycle at the mouth of the Kill Van Kull and at the entrance to Newark Bay provide insight into the tidal exchange in these waterways. The variation in salinity at the mouth of the Kill Van Kull consists of an expected monotonic decrease from its maximum value at high water slack to its minimum value at the end of the ebb, but during the flood tide, the salinity increases rapidly to a relative maximum which occurs 2-1/2 hours after low water slack, then decreases to a minimum at 4-1/2 hours into the flood cycle and finally increases to its maximum value at

high water slack. This atypical variation in salinity is undoubtedly the result of the initial inflow to the Kill of waters drawn from regions of Upper Bay upstream of the entrance to the Kill and the subsequent inflow from regions downstream of the Kill. At the entrance to Newark Bay, the salinity during the ebb decreases to its maximum value about 4 hours after low water slack. During the last stages of the flood, the salinity decreases to an intermediate value at high water slack. This behavior of the salinity variation during the flood state at the entrance to Newark Bay most likely reflects the initial predominance of the Kill Van Kull at the source of flooding waters to Newark Bay, and then the effect of the subsequent inflow of waters from the Arthur Kill.

b. Hydraulic Residence Time and Flushing Characteristics

The two layer net circulation pattern which occurs in the Hudson River, Upper Bay, Kill Van Kull, Newark Bay and Lower Bay of New York Harbor is typical of partially mixed, coastal plain estuaries. This net circulation provides the estuary with a far greater flushing rate than would be the case if the net circulation were solely a seaward transport due to the fresh water discharge.

An initial estimate of the rate at which pollutants confined to the upper seaward flowing layer would be carried seaward can be obtained from the tidal current charts for New York Harbor. With average tidal ranges, these charts indicate that in the lower Hudson and Upper Bay, the near surface waters are transported about 13 km (7 nautical miles) upstream by the flood currents and about 19 km (10 nautical miles) downstream on the ebb. There is therefore a net displacement of these near surface waters of about 6 km (3 nautical miles) during each complete tidal cycle. This implies that it would require about one complete tidal cycle to transport near surface waters from the vicinity of Kill Van Kull in the Upper Bay to the Verrazano Narrows Bridge (a distance of approximately 6 km or 3 nautical miles).

Below the Narrows in Lower Bay, the flow pattern cannot be treated as simply. According to Jeffries (1962), there is a slow moving counterclockwise gyre in the Lower Bay-Raritan Bay waters. Some of the discharge from Upper Bay is apparently entrained in

this gyre, moved into Raritan Bay along its northern boundary, and then eventually discharged around Sandy Hook into the ocean. This grye acts to increase the residence time of at least a portion of the Upper Bay water that is advected into Lower Bay. For waters not entrained in this grye, the tidal current charts for the near surface waters can be employed to estimate their net seaward movement through Lower Bay during each tidal cycle. We find that the net displacement downstream is roughly two miles per tidal cycle and consequently it would take about two days for the surface waters to be transported from the vicinity of the Verrazano Narrows Bridge to the Harbor entrance. Thus, a contaminant discharge into the Upper Bay near Kill Van Kull and confined to the near surface layers would clear the Harbor within 2-3 days, provided that it did not become entrained in the sluggish gyre in Raritan Bay.

4. Oceanographic Conditions in the Vicinity of the Current and Proposed Modified Discharge (40 CFR 125.61(a))

a. Current Speed and Direction

The Kill Van Kull is directly under the influence of tidal action of the ocean via the Upper Bay and the Arthur Kill. The tidal current is of the reversing type; it sets in one direction for a period of about 6.2 hours after which it ceases to flow momentarily (slack water) and then sets in the opposite direction during the following 6.2 hours. Average maximum and minimum speeds and directions of the tidal currents for stations in the Kill Van Kull are given in Exhibit IIB-14.

The lowest ten percentile current speed in the vicinity of the discharge can be calculated using the average maximum current speed for the West New Brighton station and Table 4a in the U.S. Department of Commerce Tidal Current Tables (1981). Assuming a tidal period of 6.2 hours, the lowest ten percentile current speed would occur for a period of 37 minutes surrounding slack. By interpolation of values given in Table 4a, the maximum current speed for a 37 minute period surrounding slack, where the maximum average current is 4.3 cm/sec (2 knots), is 0.7 cm/sec (0.32 knots).

b. Stratification

Salinity across the New York Harbor entrance increases with depth. The largest differences or the highest degree of vertical stratification was found in April 1974, and the smallest in November 1973. As a general rule, the intensity of vertical stratification in estuaries is increased when either the fresh water discharge decreases or the mixing due to tidal action is diminished. In the present case, the average fresh water discharge in April was five times greater than the average discharge in November.

In a 1977 survey of Kill Van Kull, Newark Bay, and the Lower Passaic River, lowest salinities were observed on March 18, 1977. Vertical salinity stratification was noted in Newark Bay on this date, coinciding with a peak in freshwater discharge. On June 28, 1977 the highest salinity values in these waters were observed along with a virtual lack of vertical stratification.

5. Ambient Water Quality Conditions (40 CFR 125.61(a)(2))

a. Identification of Critical Period

The summer months of June, July, August and September are the period of lowest freshwater flow and highest water temperature. The New York City 208 Water Quality Management Plan, Seasonal Water Quality Evaluation (Hazen and Sawyer, 1977) identified the summer period as the "worst case" because of low flow and peak (high) temperatures. The Interstate Sanitation Commission operated an automatic water quality monitoring station in the Kill Van Kull (terminated in 1982). Dissolved oxygen levels recorded at this station were lowest in the months of July, August, and September.

b. Historic Water Quality Data

Water quality for the Kill Van Kull and adjacent waterways has been described by several sources. As part of a study by the U.S. Army Corps of Engineers, New York District (1980) on navigation channel widening in Newark Bay and Kill Van Kull, a water quality sampling program was conducted. Seven water quality sampling stations were

established in the navigation channels in Kill Van Kull and in southern Newark Bay (Exhibit IIB-15). Station 8 is located in northern Newark Bay, stations 9 and 10 are in the Passaic River and stations 11 and 12 are in the Hackensack River. Six cruises were taken between April 23 and August 11, 1976. Results of analyses for salinity, temperature, dissolved oxygen and pH are shown in Exhibits IIB-16 through IIB-19, respectively.

The Interstate Sanitation Commission operated, until 1982, an automatic water quality sampling station in the Kill Van Kull at U.S. Gypsum Company on Staten Island. The station, as shown on Exhibit IIB-15, is located approximately 2200 yards (4.4 nautical miles) east of the Bayonne Sewage Treatment Plant. Maximum monthly, minimum monthly, and average values for water quality parameters tested are shown in Exhibit IIB-20 for 1977 through 1981. Parameters include dissolved oxygen, temperature, conductivity and pH.

The Interstate Sanitation Commission conducts boat surveys of the New York Harbor waters. Results of the Interstate Sanitation Commission boat surveys conducted from October 1978 through September 1979 and including the Kill Van Kull and adjacent waters are summarized in Appendix I. The Interstate Sanitation Commission is currently performing a coliform sampling survey of the New York Harbor Estuary. Sampling survey stations are located on Exhibit IIB-21. Results of total and fecal coliform bacteria analyses from March through June 1982 are given on Exhibit IIB-22.

c. Water Quality

Available data on water quality parameters are discussed for the summer months.

i. Salinity

Salinity distributions in the receiving waters of the Bayonne Sewage Treatment Plant were discussed on page IIB-3. The New York City 208 Study found that during June, July, August and September, 1974-1976, the Upper Bay appears to be vertically stratified, i.e., there is a significant difference between surface and bottom salinity profiles. Salinity does not vary as much along the vertical profile for stations in the Arthur Kill, Kill Van Kull, and Newark Bay, indicating better mixing in those areas.

Review of the Interstate Sanitation Commission data for the Kill Van Kull-U.S. Gypsum Station on conductivity shows the effect of reduced fresh water inflow during the summer critical period. Conductivity values are highest during the summer critical period.

Sampling by the U.S. Army Corps of Engineers (1980) from April to August 1976 (Exhibits IIB-15 and IIB-16) showed that salinity values increased over the period of the survey and were highest during the July and August cruises, resulting from the low fresh water discharges during these months. The salinity was greatest at the mouth of the Kill Van Kull (Station 1) and decreased steadily towards the northern part of Newark Bay. Mean salinities at the Kill Van Kull/Upper Bay Station (1) for the six cruises was 17.4 ppt for the surface and 22.5 ppt for the bottom waters. Salinity differences between surface and bottom waters were greatest in the Passaic River and Newark Bay stations, indicating a "salt wedge". Mean differences in salinity between surface and bottom waters ranged from 3 to 8 ppt for those stations. Salinity differences with depth were generally less than 2 ppt in the Kill Van Kull. The Army Corps attributes this to the mixing processes caused by the hydrodynamic conditions existing in the Upper Bay and Kill Van Kull.

ii. pH

The NYC 208 found that summer season surface pH values ranged from 7.0 to 7.5. Values for pH were similarly distributed throughout the year. In the Army Corps water quality survey, summer season pH fluctuated between 6.85 and 7.2. Values for pH were closely correlated with dissolved oxygen (DO) concentrations. Low DO favors anaerobic conditions which result in an increase in hydrogen ion concentration (low pH).

iii. Temperature

The NYC 208 reported highest temperature values in the Arthur Kill due to thermal discharges. Analysis of summer season temperatures for surface and bottom samples showed that there was no significant difference between them. The Army Corps also reported that little temperature stratification was found. The Newark Bay and Passaic River stations generally showed the greatest temperature differences ($2^{o}C$) between surface and bottom waters, while the Kill Van Kull generally had surface and bottom

temperature differences of less than 1°C. The lack of stratification in the Kill Van Kull was attributed to the pronounced mixing processes that take place.

iv. Turbidity

Turbidity is caused by the presence of suspended materials such as silt, organic and inorganic matter, and microscopic organisms. The NYC 208 found that the Arthur Kill, Newark Bay and Kill Van Kull area was an area of high turbidity. Turbidity was found to decrease within the New York Harbor with the dilution and settling effects of the tidal movement of ocean water.

v. Dissolved Oxygen

Dissolved oxygen (DO) concentrations are lowest during the summer period. High temperatures have lower saturation values for oxygen solubility in water. Bacterial activity is also increased by high temperatures and results in an increased utilization of dissolved oxygen. Frequency analysis of summer 1974-1976 DO data by NYC 208 showed that at least 25 percent of DO values for the Upper Bay and for the Arthur Kill-Newark Bay-Kill Van Kull area were below the minimum standard (3.0 ppm). The Interstate Sanitation Commission noted an improvement in summer 1981 DO concentrations over previous years. The ISC Kill Van Kull-U.S. Gypsum Station met ISC dissolved oxygen requirements 95.7, 96.8, and 94.2 percent of the time in the months of July, August and September, 1981 respectively. DO requirements were met 100 percent of the time from October 1980 through June 1981 (ISC, 1982).

Stevens Institute of Technology found summer 1977 dissolved oxygen concentrations in the Kill Van Kull and Newark Bay to vary from 2 to 3 ppm.

The U.S. Army Corps of Engineers (1980) found that in their June 9, 1976 cruise of Newark Bay and Kill Van Kull, dissolved oxygen average values were 3.65 mg/l and 2.85 mg/l for surface and bottom water, respectively. Levels remained substantially the same during July. However, by the August 11 cruise, DO levels had dropped to 2.5 mg/l. The decrease observed in the summer months correlated with the rise in water temperature.

vi. Biochemical Oxygen Demand

Frequency analysis of BOD_5 surface and bottom concentrations for the summers of 1974-1976 shows about two-thirds of the summertime BOD_5 values fall between 2.5 and 5.0 mg/l in the entire NYC 208 study area (NYC 208). Bottom conditions may be slightly worse in the Upper Bay, Arthur Kill and Newark Bay.

vii. Coliform Bacteria

NYC 208 reported that 1974-1976 summer season data for coliform bacteria show the Arthur Kill, Newark Bay, Kill Van Kull and Upper Bay are grossly contaminated, with average total coliform geometric means of about 70,000/100 ml.

The Interstate Sanitation Commission is currently performing a coliform study of the New York Harbor (Exhibits IIB-21 and IIB-22). Station 20 is located at the junction of Upper Bay and Kill Van Kull. Station 19 is located in southern Newark Bay near the Kill Van Kull. Analysis of seven samples collected from March through June, 1982 shows higher average values for total and fecal coliform at the Newark Bay station (18,600/6000 MPN) than at the Kill Van Kull/Upper Bay station (14,400/1600 MPN). The June 1, 1982 samples also show lower coliform values in the Upper Bay than in Newark Bay.

6. Sediment Analysis

Particle size analysis of bottom sediments in Newark Bay and vicinity revealed mostly fine grained materials to be present. Grab samples taken in the Newark Bay complex contained: sand (40.5%), silt (34.5%), clay (14.3%), and rock (7.5%) (Army Corps of Engineers, 1980). Bottom sediments in the Kill Van Kull were sufficiently hard to prevent the acquisition of a suitable sample by the Army Corps of Engineers. This is an area of strong tidal currents and tidal scouring of the bottom material occurs.

In the areas of most rapid sedimentation, such as the channel north of Shooters Island, Port Newark, and the Passaic River, the bottom sediments are composed of particles with mean grain sizes in the fine to very fine silt range. It was in these areas that the

highest total carbon concentrations were found, probably due to increased deposition of organic materials.

The Army Corps of Engineers analyzed bore hole samples in the Newark Bay-Kill Van Kull area in 1975. Results of suspended solids, biochemical oxygen demand, and total organic carbon analysis of near surface samples are presented in Exhibit IIB-23.

BAYONNE 301(h) APPLICATION

EXHIBIT IIB-1

TIDE HEIGHTS AND TIME DIFFERENCES RELATIVE TO THE BATTERY

Location	Time Difference[a]		Height Difference	
	High Water	Low Water	High Water	Low Water
Kill Van Kull				
Constable Hook	-34 min	-21 min	0	0
New Brighton	-12 min	-18 min	0	0
Port Richmond	-3 min	+5 min	0	0
Bergen Point	+3 min	+3 min	+0.1 ft	0
Newark Bay				
Shooters Island	+6 min	+18 min	+0.1 ft	0
Port Newark Terminal	-1 min	+18 min	+0.6 ft	0
Western Side of Upper Bay				
Bayonne	-19 min	-8 min	0	0
Jersey City	+7 min	+7 min	-0.1 ft	0
Arthur Kill[b]				
Elizabethport	-20 min	-5 min	+0.4 ft	0
Perth Amboy	-35 min	-25 min	+0.7 ft	0

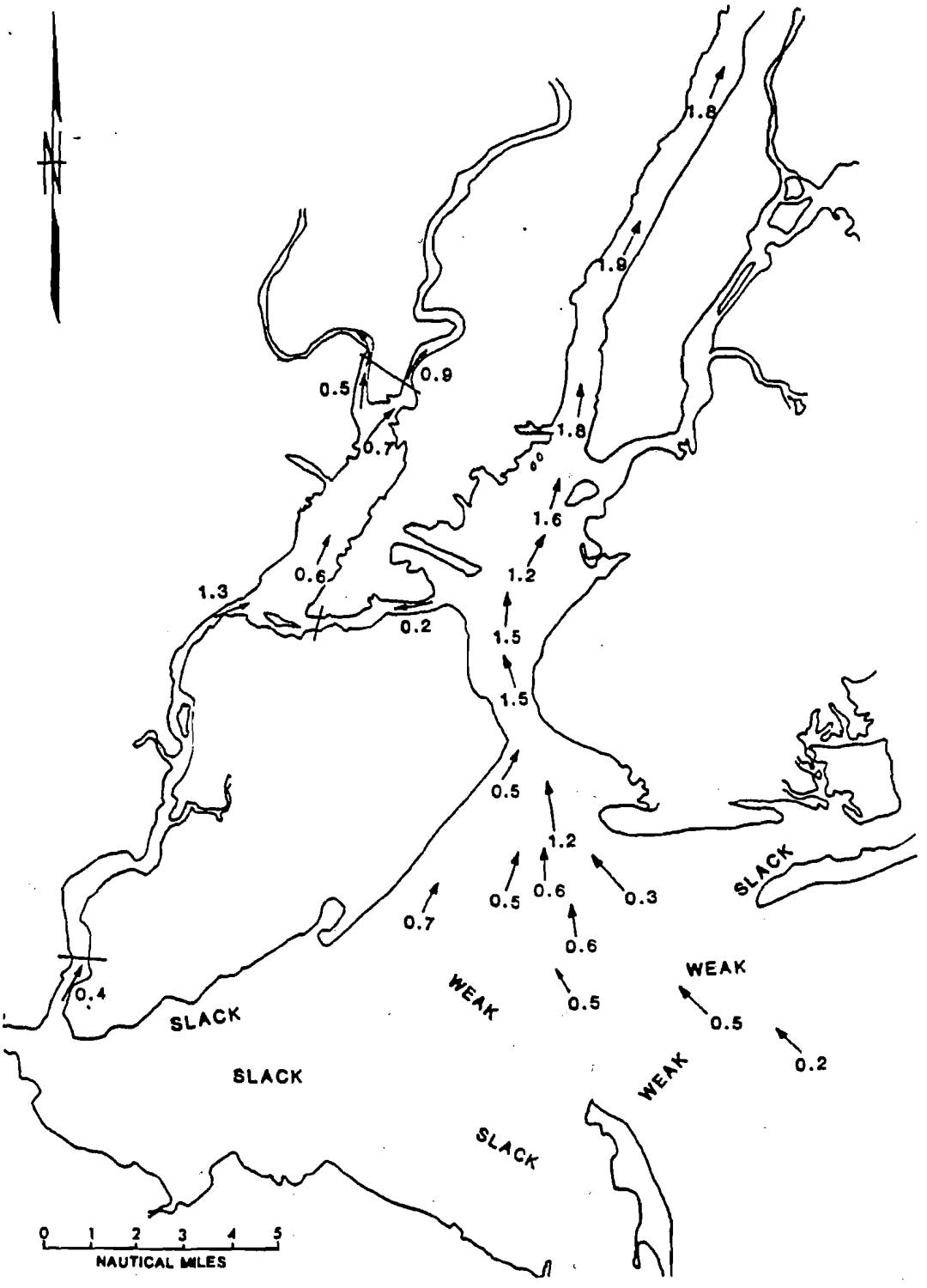
Notes

(a) Negative time differences imply that high water or low water occurs at this location before it occurs at the Battery.

(b) The time differences for subordinate stations in the Arthur Kill are given relative to Sandy Hook in the Tide Tables. Presented here are the approximate values for these differences relative to the Battery in order to facilitate comparisons with the values listed for other stations.

Source: U.S. Department of Commerce, 1982.

Exhibit IIB-2



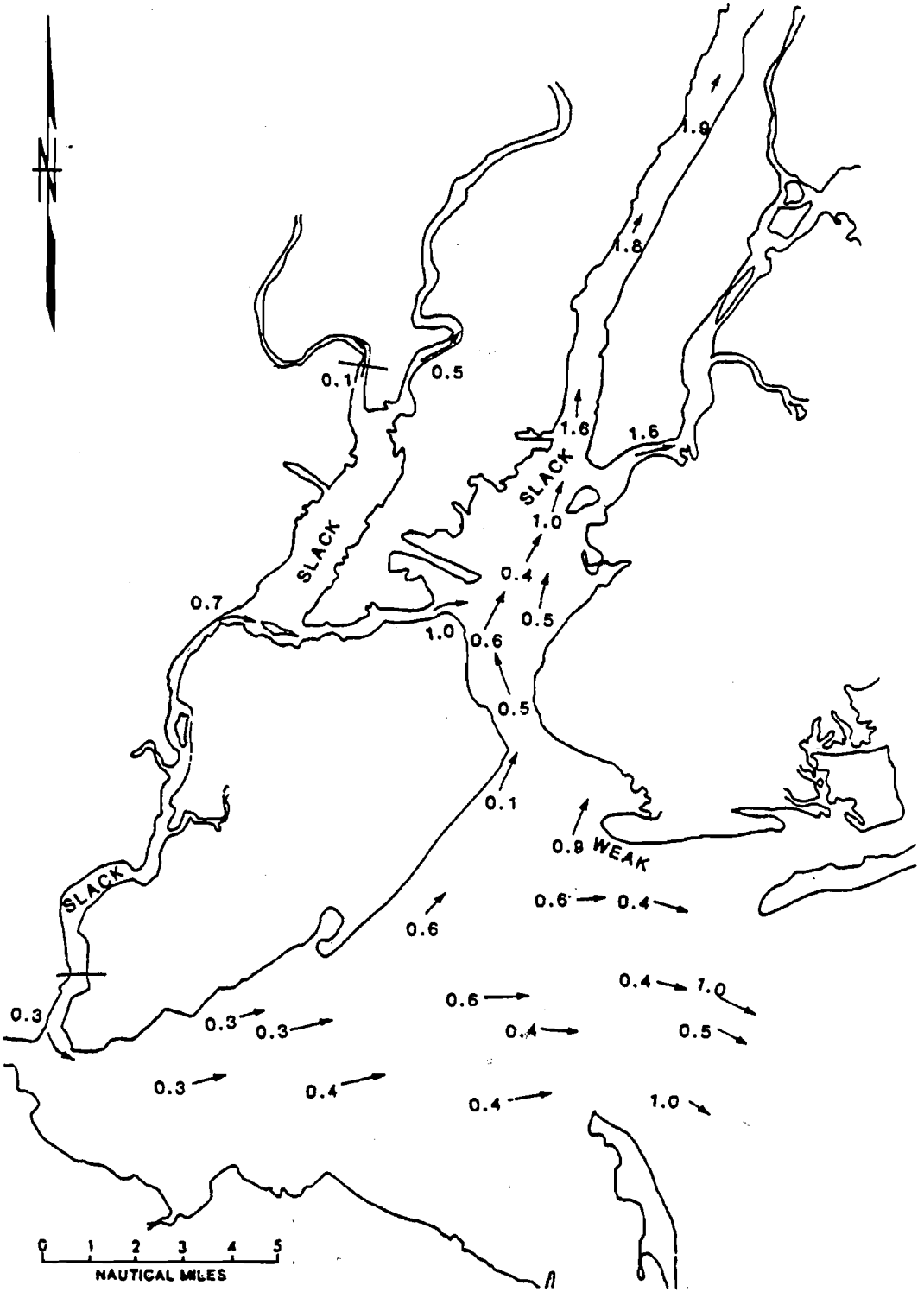
EXHIBITS IIB-2 THROUGH IIB-13 SHOW TIDAL CURRENT VELOCITIES OF THE SURFACE WATERS, DURING SPRING TIDES. CURRENTS IN KNOTS.

BAYONNE 301(h) APPLICATION

HIGH WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

Exhibit II B-3

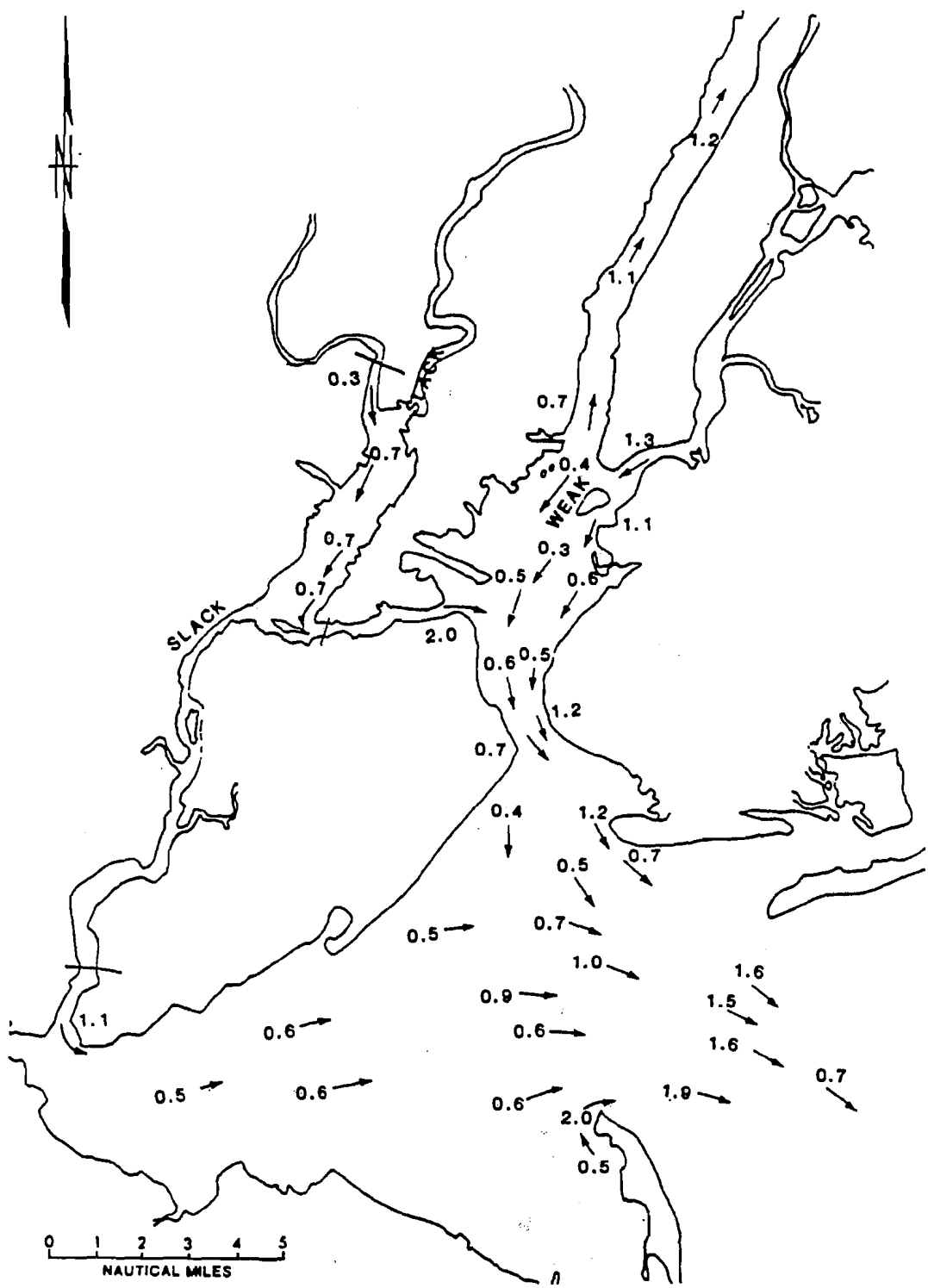


BAYONNE 301(h) APPLICATION

ONE HOUR AFTER
HIGH WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

Exhibit IIB-4

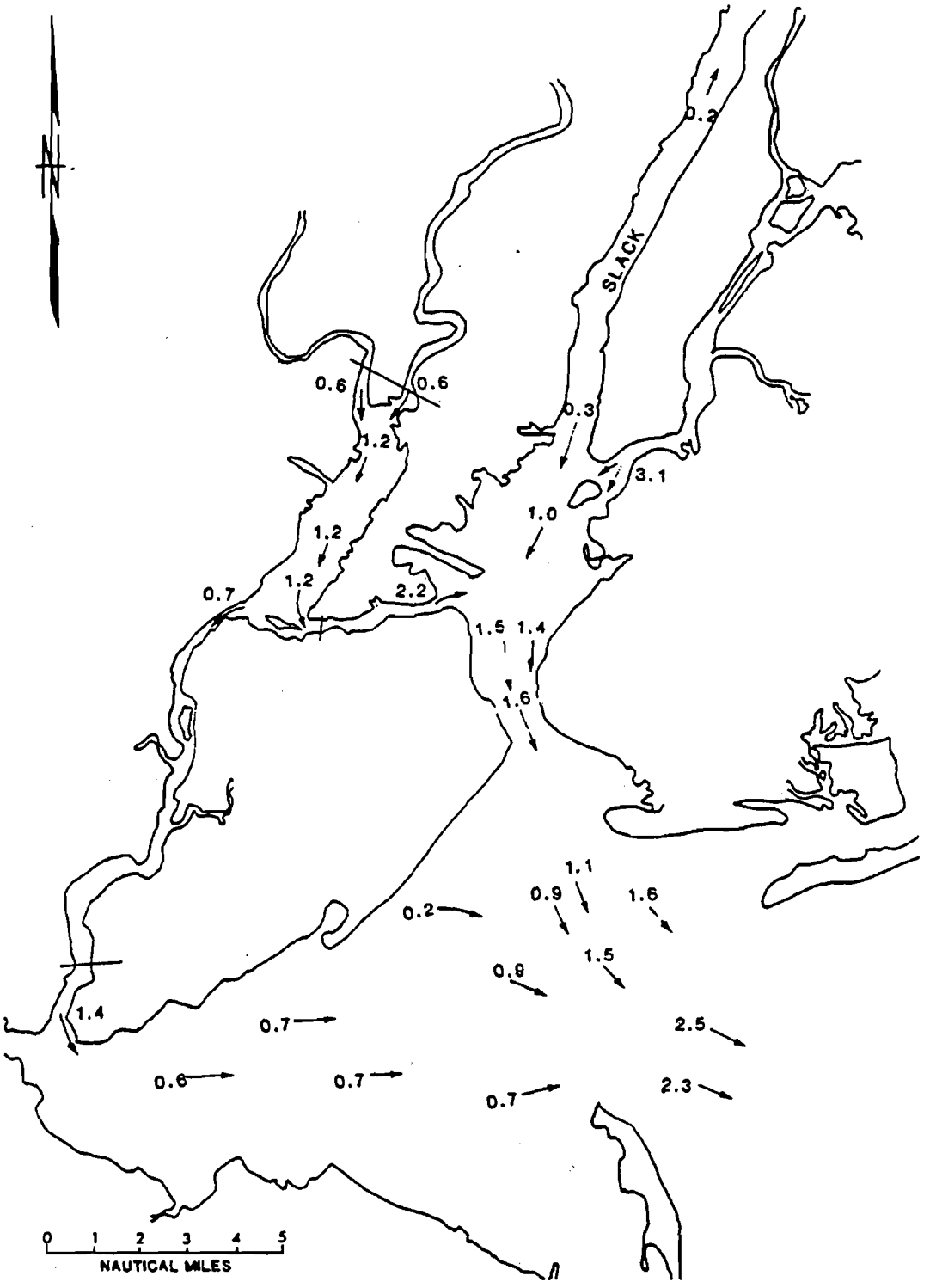


BAYONNE 301(h) APPLICATION

TWO HOURS AFTER
HIGH WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

Exhibit IIB-5

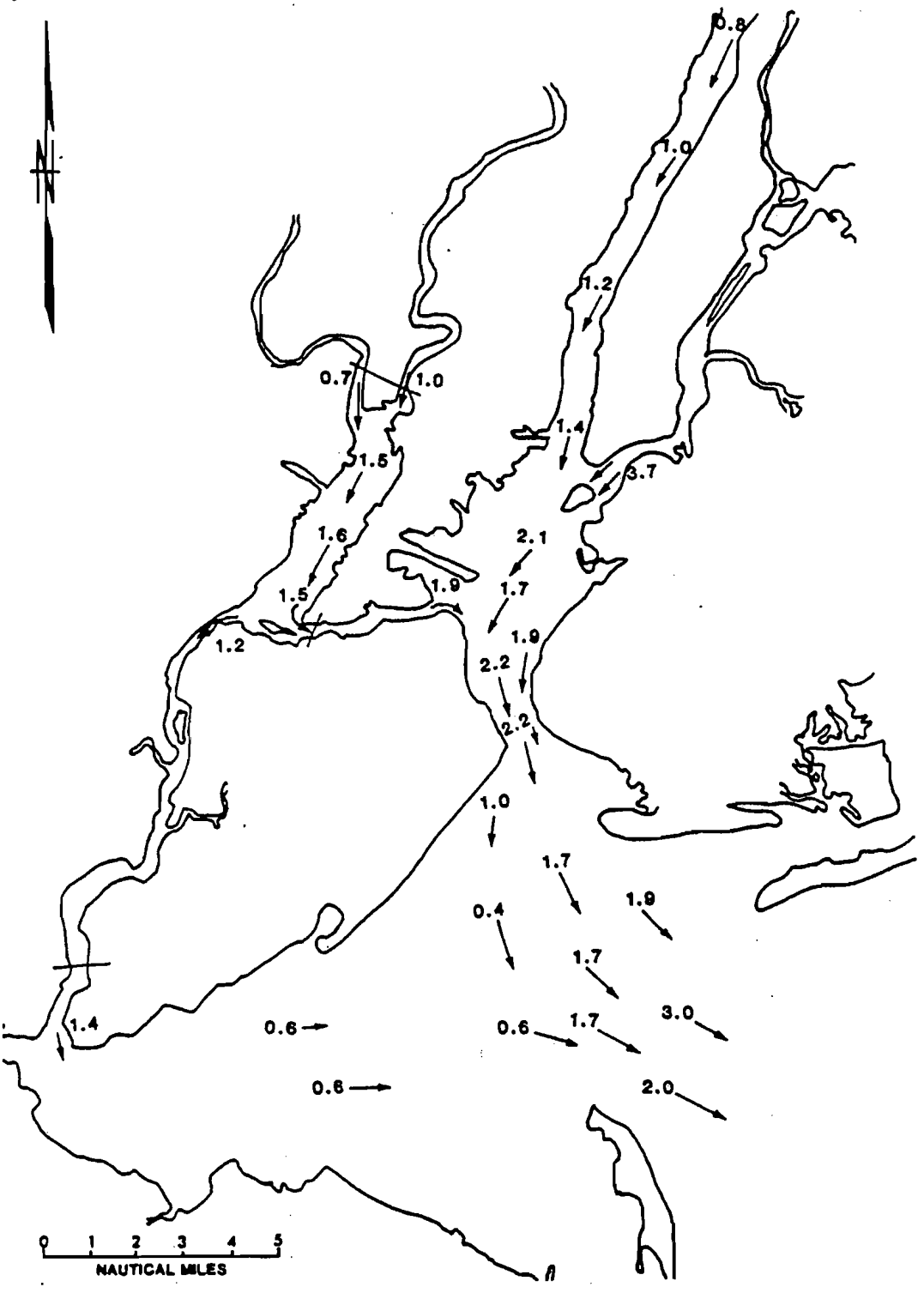


BAYONNE 301(h) APPLICATION

THREE HOURS AFTER
HIGH WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

Exhibit IIB-6

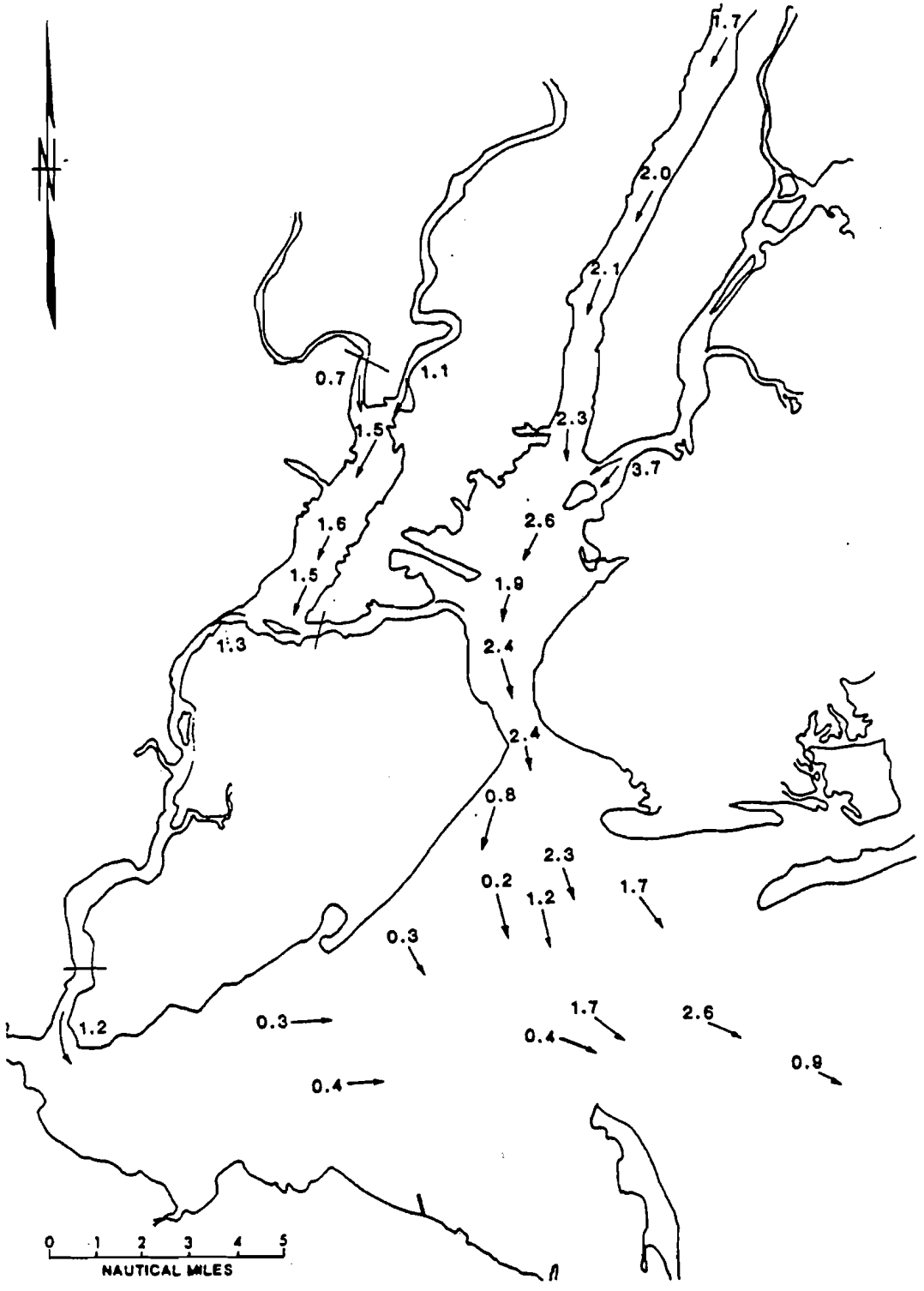


BAYONNE 301(h) APPLICATION

HAZEN AND SAWYER, P.C.
Engineers

FOUR HOURS AFTER
HIGH WATER AT NEW YORK

Exhibit IIB-7

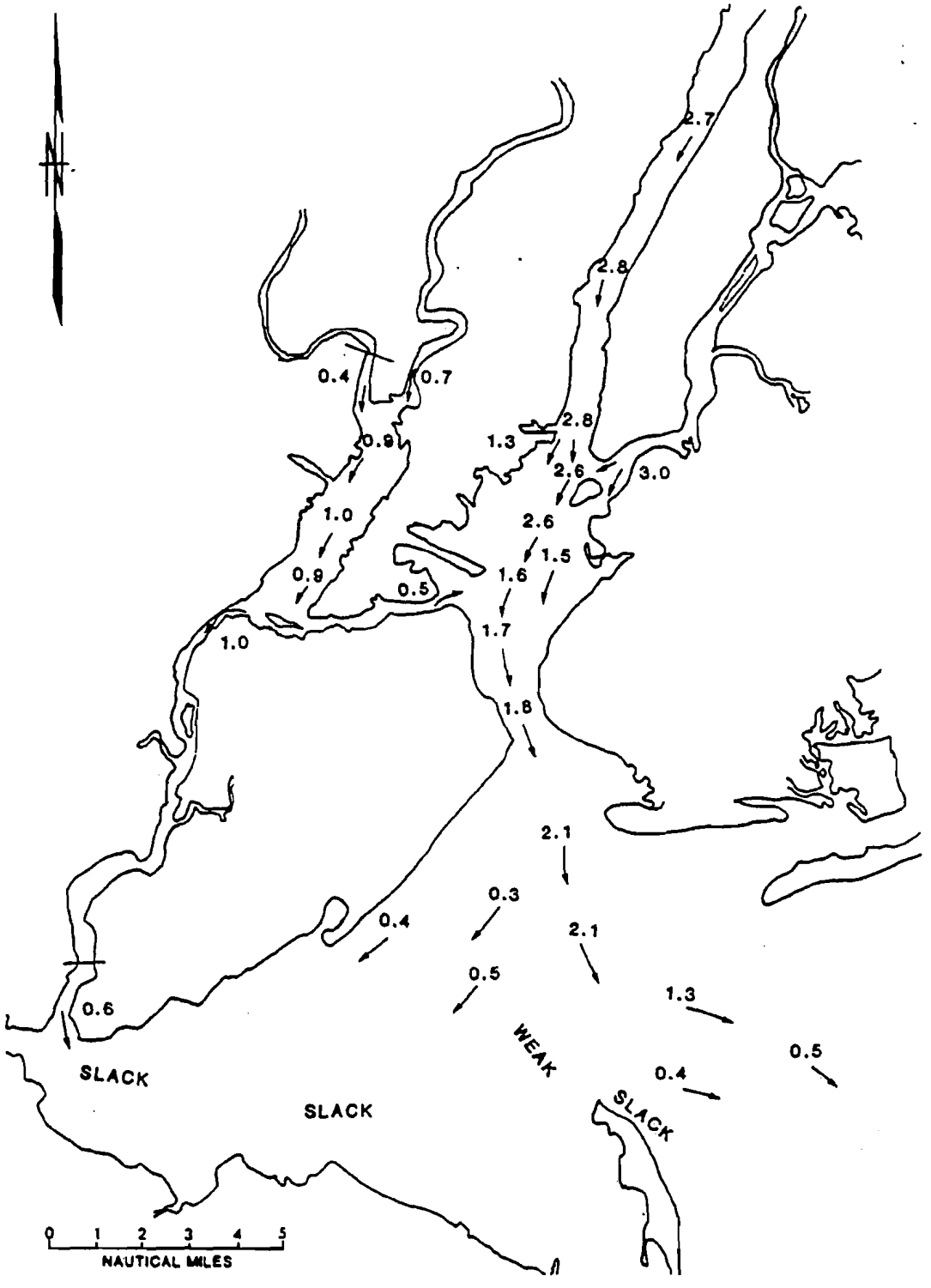


BAYONNE 301(h) APPLICATION

FIVE HOURS AFTER
HIGH WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

Exhibit IIB-8

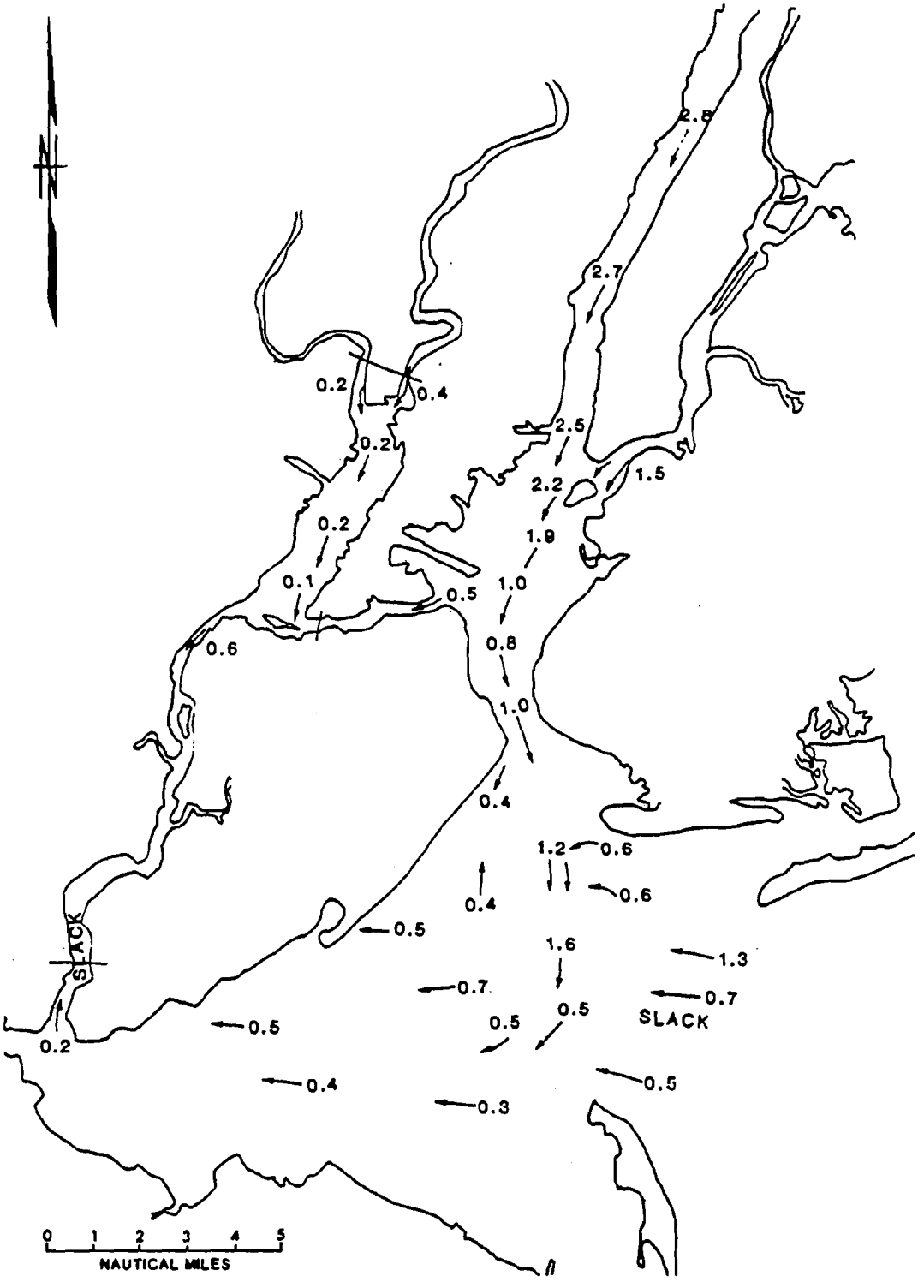


BAYONNE 301(h) APPLICATION

LOW WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

Exhibit IIB-9

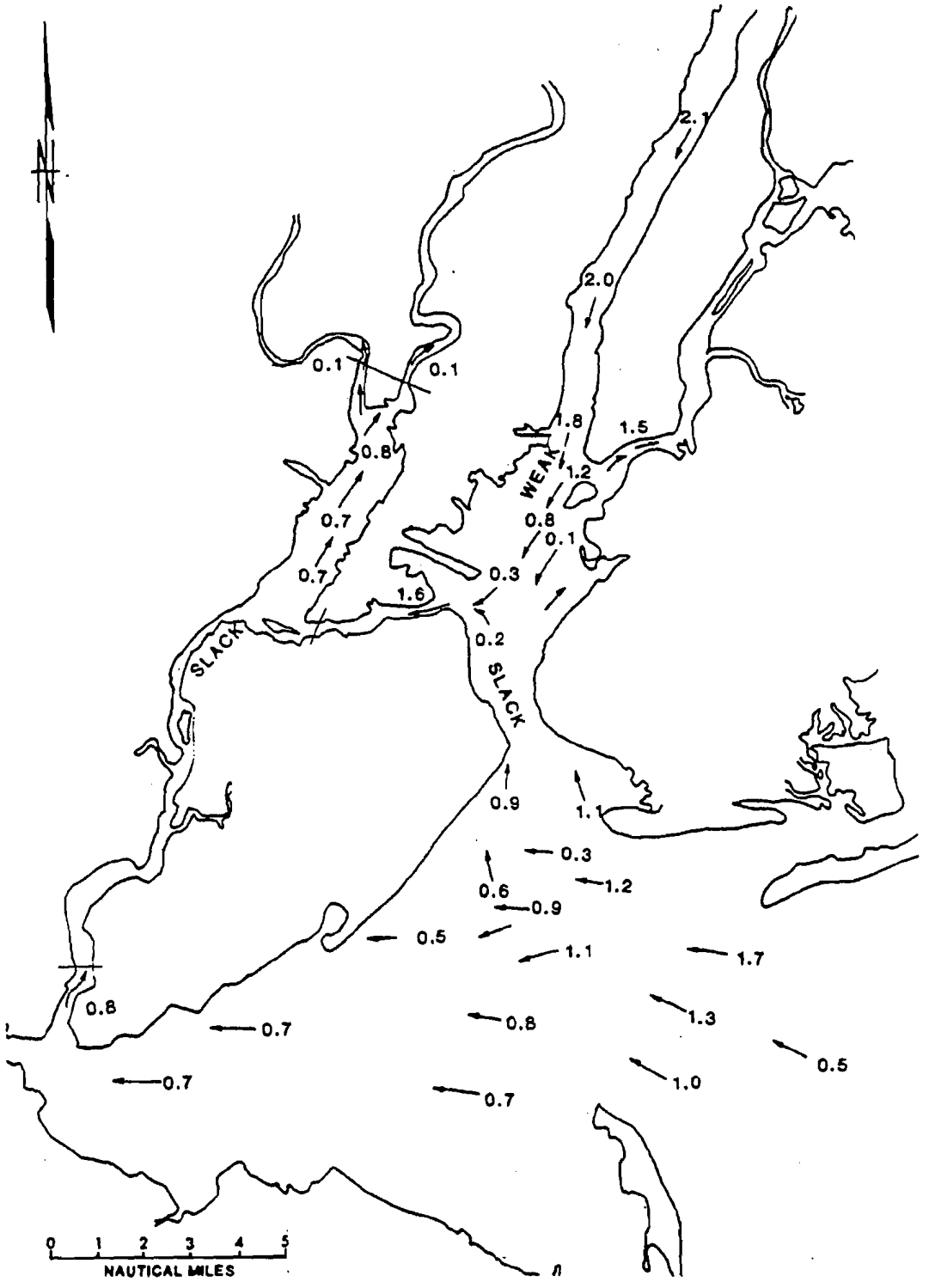


BAYONNE 301(h) APPLICATION

ONE HOUR AFTER
LOW WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

Exhibit IIB-10

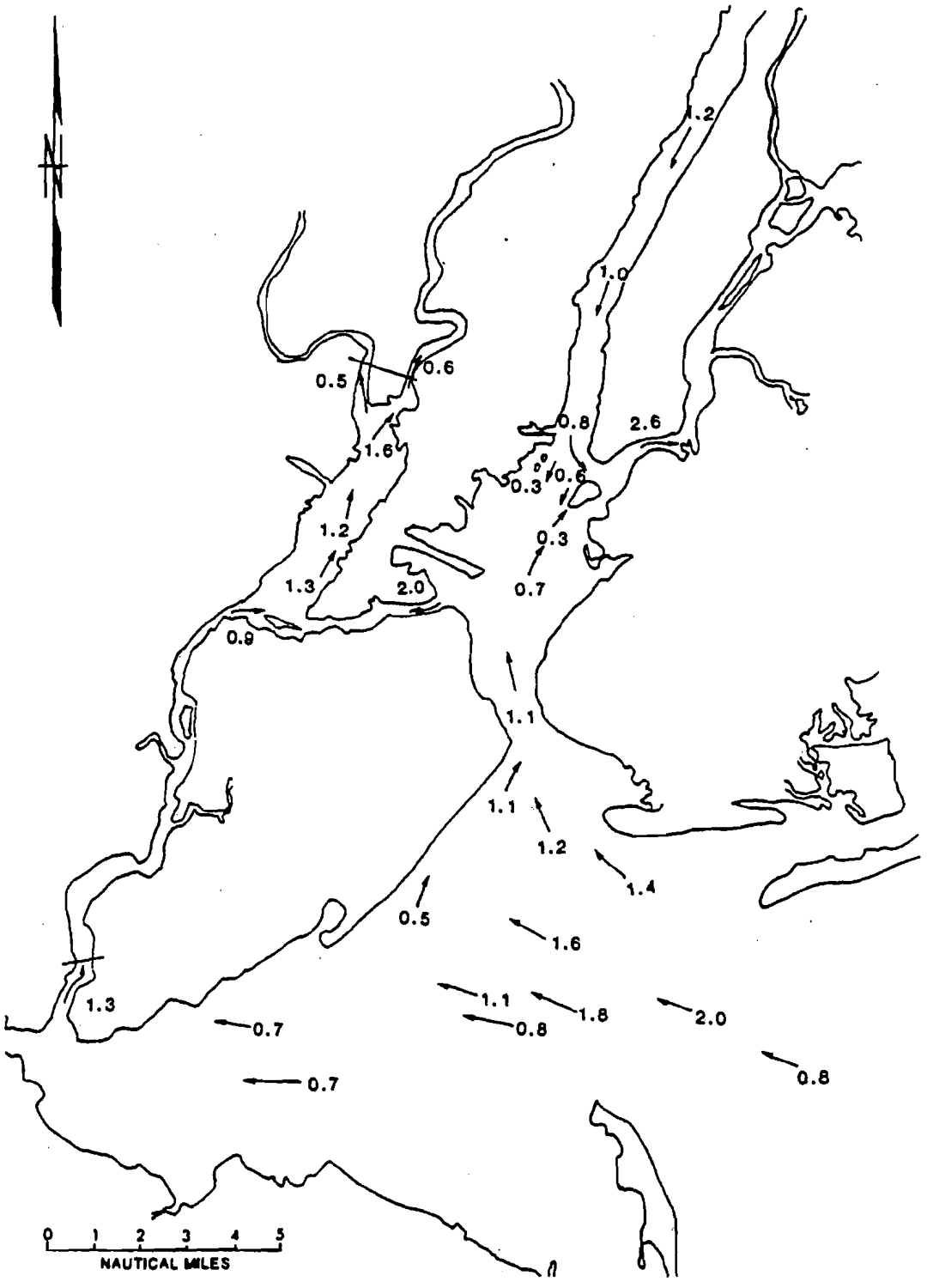


BAYONNE 301(h) APPLICATION

TWO HOURS AFTER
LOW WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

Exhibit IIB-II

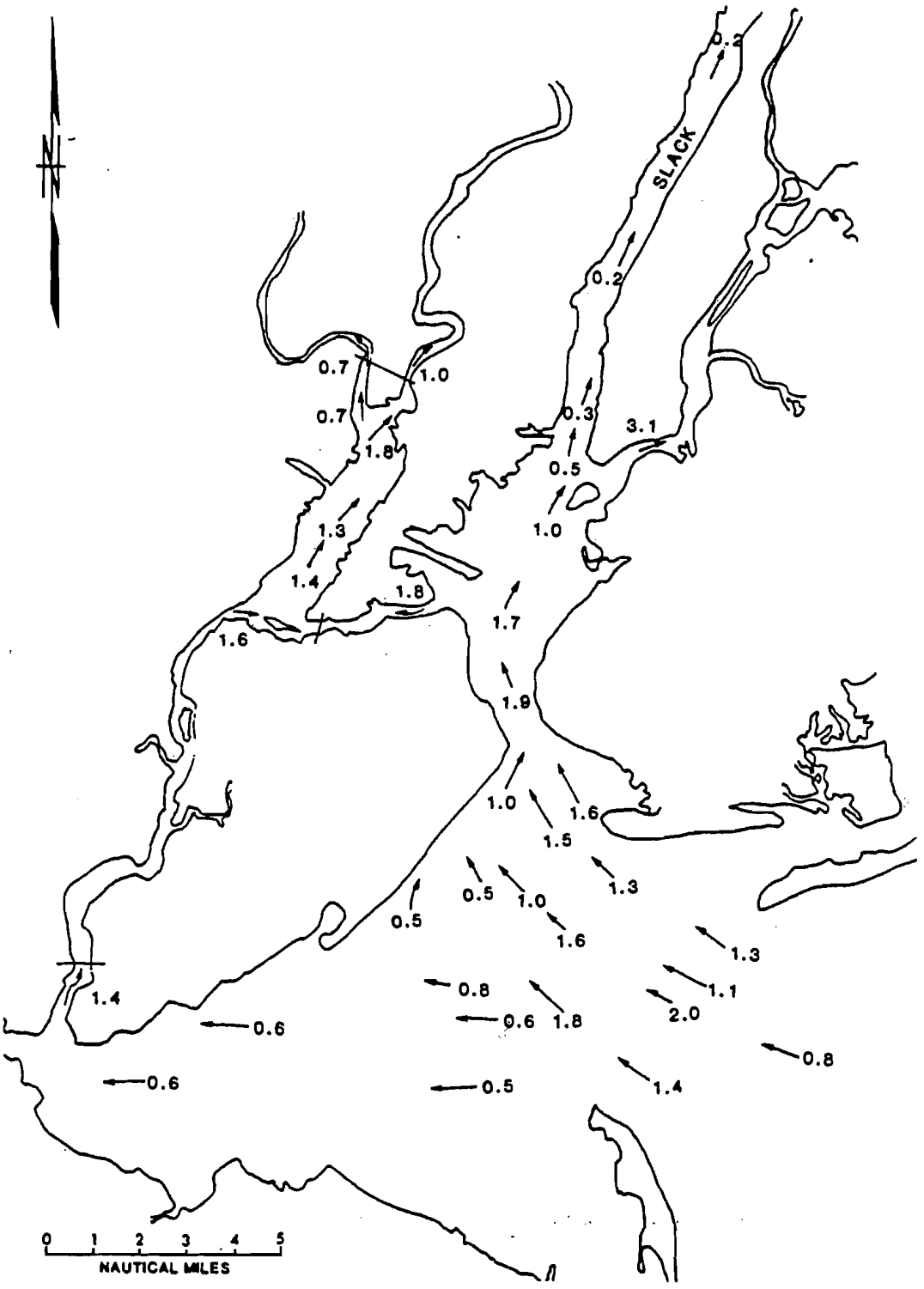


BAYONNE 301(h) APPLICATION

THREE HOURS AFTER
LOW WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

Exhibit IIB-12

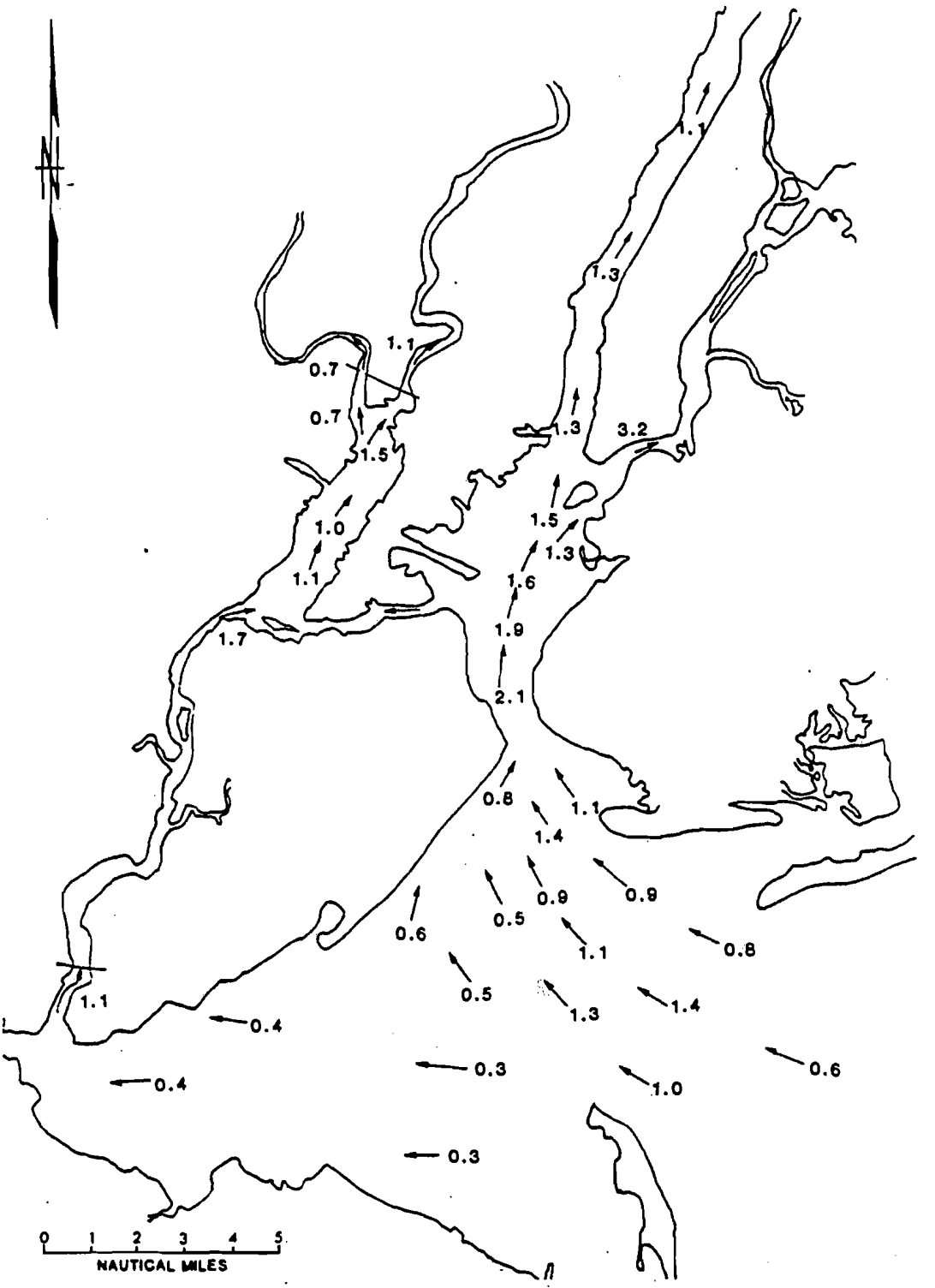


BAYONNE 301(h) APPLICATION

FOUR HOURS AFTER
LOW WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

Exhibit IIB-13



BAYONNE 301(h) APPLICATION

FIVE HOURS AFTER
LOW WATER AT NEW YORK

HAZEN AND SAWYER, P.C.
Engineers

BAYONNE 301(h) APPLICATION

EXHIBIT IIB-14

AVERAGE TIDE CURRENT SPEEDS AND DIRECTIONS IN KILL VAN KULL

Station in Kill Van Kull	Average Speeds and Directions							
	Minimum Before Flood		Maximum Flood		Minimum Before Ebb		Maximum Ebb	
	cm/sec (knots)	deg.	cm/sec (knots)	deg.	cm/sec (knots)	deg.	cm/sec (knots)	deg.
Shooters Island, south of	0.0	--	1.7(0.8)	275	0.0	--	0.9(0.4)	085
Bayonne Bridge	0.0	--	3.9(1.8)	260	0.0	--	3.6(1.7)	080
West New Brighton	0.0	--	4.3(2.0)	240	0.0	--	4.3(2.0)	075
New Brighton, off channel	0.0	--	4.1(1.9)	275	0.0	--	2.6(1.2)	095
Entrance	0.0	--	3.2(1.5)	275	0.0	--	3.9(1.8)	060
Robbins Reef Light, 0.6 mile SW of Kill Van Kull	0.0	--	2.4(1.1)	310	0.0	--	2.8(1.3)	105

Source: U.S. Department of Commerce, NOAA, National Ocean Survey. Tidal Current Tables, Atlantic Coast of North American, Rockville, Maryland 1981.

HAZEN AND SAWYER, P.C. Engineers

BAYONNE 301(h) APPLICATION

WATER QUALITY MONITORING STATIONS IN KILL VAN KULL

EXHIBIT IIB-15

BAYONNE 301(h) APPLICATION

EXHIBIT IIB-23

SEDIMENT ANALYSIS OF BORINGS
IN KILL VAN KULL

Bore Hole No.	Chemical Analysis: Suspended Solids (mg/l)	BOD (mg/l)	TOC (mg/l)	Standard Elutriate Test COD (mg/l)
1	276	4	25	52
4	293	ND 1	16	40
7	184	4	13	56
9	240	2	17	48
10	60	2	21	4
11	254	2	24	4
12	208	ND 1	11	20
13	232	ND 1	11	8
14	214	8	11	8
15	196	ND 1	13	47
16	120	ND 1	11	47
17	174	ND 1	10	4
18	100	ND 1	12	28
19	44	2	12	16

ND = None detected, less than one

Source: U.S. Army Corps of Engineers, 1980.

D. State and Federal Laws (40 CFR 125.60)

1. Are there water quality standards applicable to the following pollutants for which a modification is requested: Biochemical oxygen demand or dissolved oxygen? Suspended solids, turbidity, light, light transmission, light scattering or maintenance of the euphotic zone? pH of the receiving water?

Yes, there are water quality standards applicable to these parameters.

2. If yes, what is the water use classification for your discharge area? What are the applicable numerical standards for your discharge area for each of the parameters for which a modification is requested?

New Jersey water quality standards are classified within a system whereby all surface waters are designated by one of eight classifications. These classifications include three classes of fresh water, three classes of tidal water, and two classes of oceanic water. All receiving waters in the Bayonne study area are classified as tidal waters. The Newark Bay and Kill Van Kull are both TW-3 waters. According to the New Jersey classifications, these waterways are to be upgraded (or maintained) for navigation, for pleasure craft, and for fish survival.

The water quality criteria for TW-3 waters issued by the New Jersey D.E.P. are listed in Appendix 5. They are derived from the official Statement of Policy, Surface Water Class Definitions and Quality Criteria of New Jersey's Water Quality Standards (N.J.A.C. 7:94 et seq.).

Toxic substances concentrations are set as one-twentieth of the TL_{50} and pesticides cannot exceed one-hundredth of the TL_{50}. The TL_{50} is that concentration at which fifty percent of the test organisms survive after 96 hours. State standards for eight toxics are presented below:

Element	mg/l
Arsenic	0.05
Barium	1.0
Cadmium	0.01
Chromium (hexavalent)	0.05
Lead	0.05
Mercury	0.005
Selenium	0.01
Silver	0.05

Acceptable limits of other toxic substances are determined through toxicity studies as previously described.

As required by the Federal Water Pollution Control Act (FWPCA) of 1972, the State has identified the water within the Bayonne study area as either "effluent limited" or "water quality limited."

Receiving Water	Classification
Newark Bay	Water quality limited
Kill Van Kull	Effluent limited

An "effluent limited" stream or segment is defined as a waterway in which State water quality standards (as established by the State) are being met and will continue to be met, or there is adequate demonstration that water quality will meet such standards by July 1, 1977, following application of the best practicable waste treatment technology (BPWTT) for publicly-owned treatment works or best practicable control technology (BPT) currently available for non-publicly owned point sources.

A "water quality limited" waterway is one where it is known that existing water quality does not meet applicable State water quality standards and/or is not expected to meet such standards even after application of the July 1, 1977, requirements. By July 1, 1983, the best available technology (BAT) economically achievable for non-publicly owned point sources and BPWTT over the life of the works for publicly owned treatment works must be implemented, according to the Federal Water Pollution Control Act.

Water quality standards have also been established by the Interstate Sanitation Commission (ISC) for the New York Northeast New Jersey Metropolitan Region. The ISC

is a joint agency of the three states of New York, New Jersey and Connecticut, with jurisdiction over waters of the Greater New York Metropolitan Area. Their jurisdictional waters include Long Island Sound, the East River, all of New York Harbor, the Hudson River up to Bear Mountain Bridge, Newark Bay, Kill Van Kull, Arthur Kill, Raritan Bay and Atlantic Ocean frontage of the region.

Under the present regulations adopted in October of 1977, the waterways within the ISC District are classified as follows:

Class A - Suitable for primary contact recreation and, in designated areas, for shellfish harvesting.

Class B-1 - Suitable for fishing and secondary contact recreation.

Class B-2 - Suitable for fish survival, passage of anadromous fish and for any other reasonable purposes compatible with their use for navigation.

The Newark Bay and the Kill Van Kull are designated as B-2 waters. These waterways have an ISC minimum dissolved oxygen level of 3 parts per million (ppm).

These ISC standards are in compliance with the NJDEP water quality standards previously outlined.

Wastewaters discharged into ISC waters of any class are governed by the following set of standards:

pH - 6.0 to 9.0

Fecal coliform - 200 per 100 ml - 30 consecutive day average
400 per 100 ml - 7 consecutive day average
800 per 100 ml - 6 consecutive ~~day~~ average
M

BOD_5 - 30 mg/l - 30 consecutive day average
45 mg/l - 7 consecutive day average
50 mg/l - 6 consecutive ~~day~~ average
M

Settleable Solids - 25 mg/l - 6 consecutive hour average

Total Suspended Solids - 30 mg/l - 30 consecutive day average
45 mg/l - 7 consecutive day average
50 mg/l - 6 consecutive ~~day~~ average
M.

The fecal coliform effluent limitations are geometric means, whereas the BOD_5, settleable solids and total suspended solids are arithmethic means.

For combined sewer overflows (CSO), the ISC requires that no CSO regulating device shall discharge unless there has been rainfall in greater than trace amounts or significant melting of frozen precipitation during the immediately preceding 24 hours.

3. Will the modified discharge comply with applicable provisions of the Coastal Zone Management Act, Marine Protection, Research and Sanctuaries Act, and the Endangered Species Act? If yes, provide the required certifications of compliance.

According to the New Jersey DEP, Division of Coastal Resources, the modified discharge will comply with the Coastal Zone Management Act once certification from the Division of Water Resources is given (Exhibit IID-1).

The New Jersey DEP, Division of Fish, Game and Wildlife, stated that there will be no impact to threatened or endangered terrestrial species near the Bayonne STP (Exhibit IID-2).

The National Marine Fisheries Service noted that the shortnose sturgeon, an endangered marine species, must be considered since the Kill Van Kull would be considered habitat for this fish (Exhibit IID-3).

4. Are you aware of any State or Federal laws or regulations (other than the Clean Water Act or the three statutes identified in item 3) or an Executive Order which is applicable to your discharge?

The New Jersey Department of Environmental Protection, Bureau of Water Pollution Control, stated that, to the best of its knowledge, there are no State or Federal laws other than those described above, which are applicable to the discharge from the Bayonne STP (personal communication).

I. NPDES PERMIT APPLICATION
STANDARD FORM A, PARTS I, II & III

FORM APPROVED
OMB No. 158- 0100

FOR AGENCY USE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER

STANDARD FORM A – MUNICIPAL

SECTION I. APPLICANT AND FACILITY DESCRIPTION

Unless otherwise specified on this form all items are to be completed. If an item is not applicable indicate 'NA.'

ADDITIONAL INSTRUCTIONS FOR SELECTED ITEMS APPEAR IN SEPARATE INSTRUCTION BOOKLET AS INDICATED. REFER TO BOOKLET BEFORE FILLING OUT THESE ITEMS.

Please Print or Type

1. **Legal Name of Applicant** (see Instructions)	101	City of Bayonne
2. **Mailing Address of Applicant** (see Instructions) Number & Street	102a	630 Avenue C
City	102b	Bayonne
State	102c	New Jersey
Zip Code	102d	07002
3. **Applicant's Authorized Agent** (see Instructions) Name and Title	103a	Kenneth J. Rakowski Municipal Engineer
Number & Street	103b	630 Avenue C
City	103c	Bayonne
State	103d	New Jersey
Zip Code	103e	07002
Telephone	103f	201 (Area Code) 858-6080 (Number)
4. **Previous Application** If a previous application for a permit under the National Pollutant Discharge Elimination System has been made, give the date of application.	104	___ ___ ___ YR MO DAY

I certify that I am familiar with the information contained in this application and that to the best of my knowledge and belief such information is true, complete, and accurate.

Kenneth J. Rakowski **Printed Name of Person Signing**	102e	Municipal Engineer **Title**
Signature of Applicant or Authorized Agent	102f	82 12 29 YR MO DAY **Date Application Signed**

18 U.S.C. Section 1001 provides that:

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and wilfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statement or representation, or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

FOR AGENCY USE

Received: ___ ___ ___ YR MO DAY

OFFICE: ___ EPA Region Number
___ State

FOR AGENCY USE

5. **Facility (see instructions)**
Give the name, ownership, and physical location of the plant or other operating facility where discharge(s) presently occur(s) or will occur.

Name	105a.	Bayonne Sewage Treatment Plant
Ownership (Public, Private or Both Public and Private).	105b.	☒ PUB ☐ PRV ☐ BPP
Check block if a Federal facility	105c.	☐ FED
and give GSA Inventory Control Number	105d.	
Location: Number & Street	105e.	Foot of Oak Street
City	105f.	Bayonne
County	105g.	Hudson
State	105h.	New Jersey

6. **Discharge to Another Municipal Facility (see instructions)**

a. Indicate if part of your discharge is into a municipal waste transport system under another responsible organization. If yes, complete the rest of this item and continue with Item 7. If no, go directly to Item 7.

	106a.	☒ Yes ☐ No

b. **Responsible Organization Receiving Discharge**

Name	106b.	Jersey City Sewage Treatment Authority
Number & Street	106c.	Route 440
City	106d.	Jersey City
State	106e.	New Jersey
Zip Code	106f.	

c. **Facility Which Receives Discharge** Give the name of the facility (waste treatment plant) which receives and is ultimately responsible for treatment of the discharge from your facility.

	106g.	Same as above

d. **Average Daily Flow to Facility (mgd)** Give your average daily flow into the receiving facility.

	106h.	0.08 mgd

7. **Facility Discharges, Number and Discharge Volume (see instructions)**
Specify the number of discharges described in this application and the volume of water discharged or lost to each of the categories below. Estimate average volume per day in million gallons per day. Do not include intermittent or noncontinuous overflows, bypasses or seasonal discharges from lagoons, holding ponds, etc.

FORM APPROVED
OMB No. 158-R0100

FOR AGENCY USE

		Number of Discharge Points		Total Volume Discharged, Million Gallons Per Day
To: Surface Water	107a1	21	107a2	
Surface Impoundment with no Effluent	107b1		107b2	
Underground Percolation	107c1		107c2	
Well (Injection)	107d1		107d2	
Other	107e1		107e2	
Total Item 7	107f1	21	107f2	
If 'other' is specified, describe	107g1			

If any of the discharges from this facility are intermittent, such as from overflow or bypass points, or are seasonal or periodic from lagoons, holding ponds, etc., complete Item 8.

8. Intermittent Discharges

a. Facility bypass points Indicate the number of bypass points for the facility that are discharge points.(see instructions) 108a1: 19

b. Facility Overflow Points Indicate the number of overflow points to a surface water for the facility (see instructions). 108b1:

c. Seasonal or Periodic Discharge Points Indicate the number of points where seasonal discharges occur from holding ponds, lagoons, etc. 108c1:

9. Collection System Type Indicate the type and length (in miles) of the collection system used by this facility. (see instructions) 109a1:

- Separate Storm: ☐ SST
- Separate Sanitary: ☐ SAN
- Combined Sanitary and Storm: ☐ CSS
- Both Separate Sanitary and Combined Sewer Systems: ☐ BSC
- Both Separate Storm and Combined Sewer Systems: ☒ SSC
- Length: 72 miles

10. Municipalities or Areas Served (see instructions)

	Name		Actual Population Served
110a1	City of Bayonne	110a2	72,000
110b1		110b2	
110c1		110c2	
110d1		110d2	
110e1		110e2	
Total Population Served		110f2	72,000

FOR AGENCY USE

11. **Average Daily Industrial Flow**
Total estimated average daily waste flow from all industrial sources. 11a. 2.2 mgd

Note: All major industries (as defined in Section IV) discharging to the municipal system must be listed in Section IV.

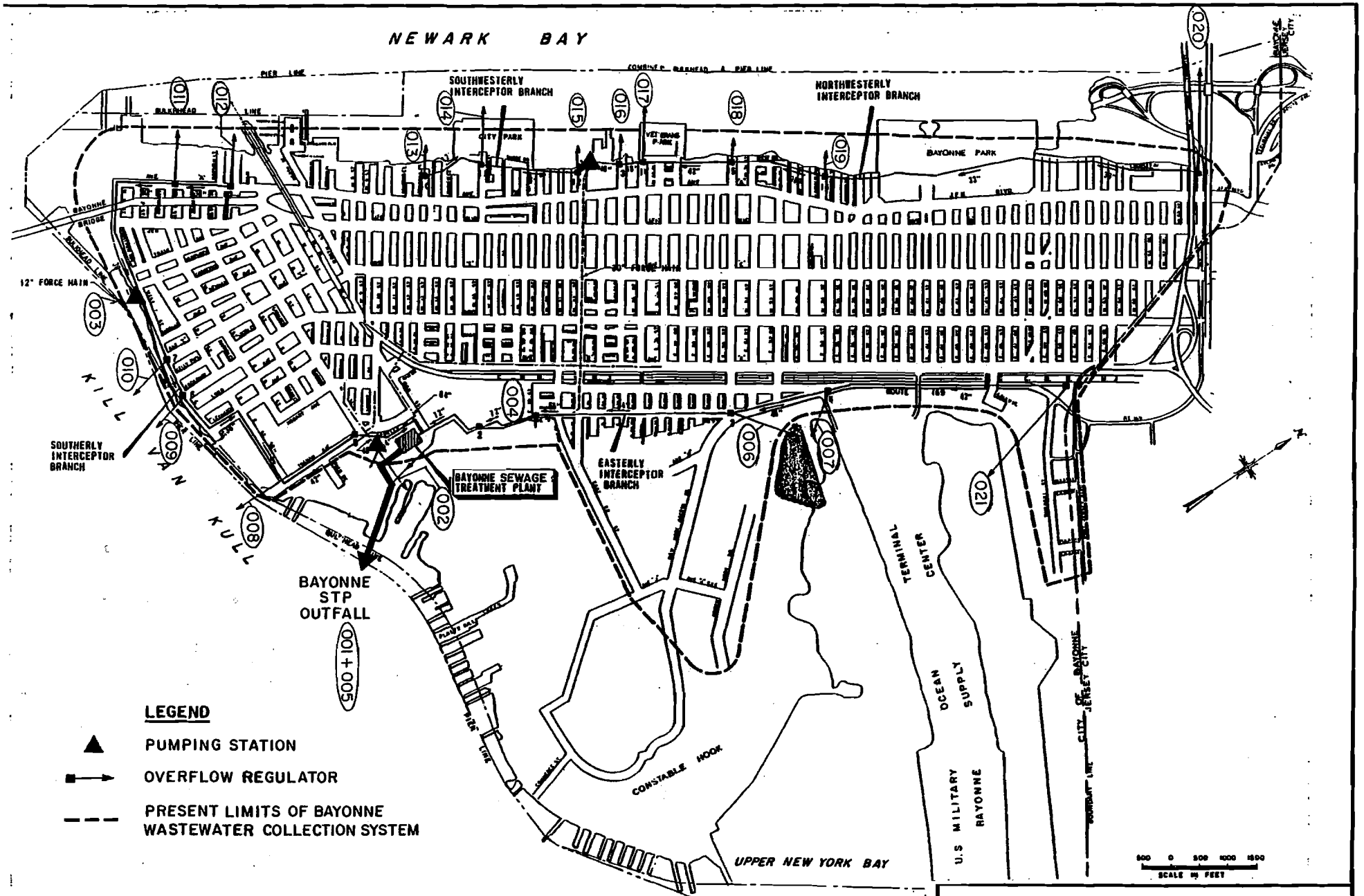
12. **Permits, Licenses and Applications**
List all existing, pending or denied permits, licenses and applications related to discharges from this facility. (see instructions)

	Issuing Agency	For Agency Use	Type of Permit or License	ID Number	Date Filed YR/MO/DA	Date Issued YR/MO/DA	Date Denied YR/MO/DA	Expiration Date YR/MO/DA
12a	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1.	State of N.J.D.E.P.		NPDES	N.J.0025836	74/4/4	78/12/31	-	83/12/31
2.								
3.								

13. **Maps and Drawings**
Attach all required maps and drawings to the back of this application. (see instructions)

14. **Additional Information**

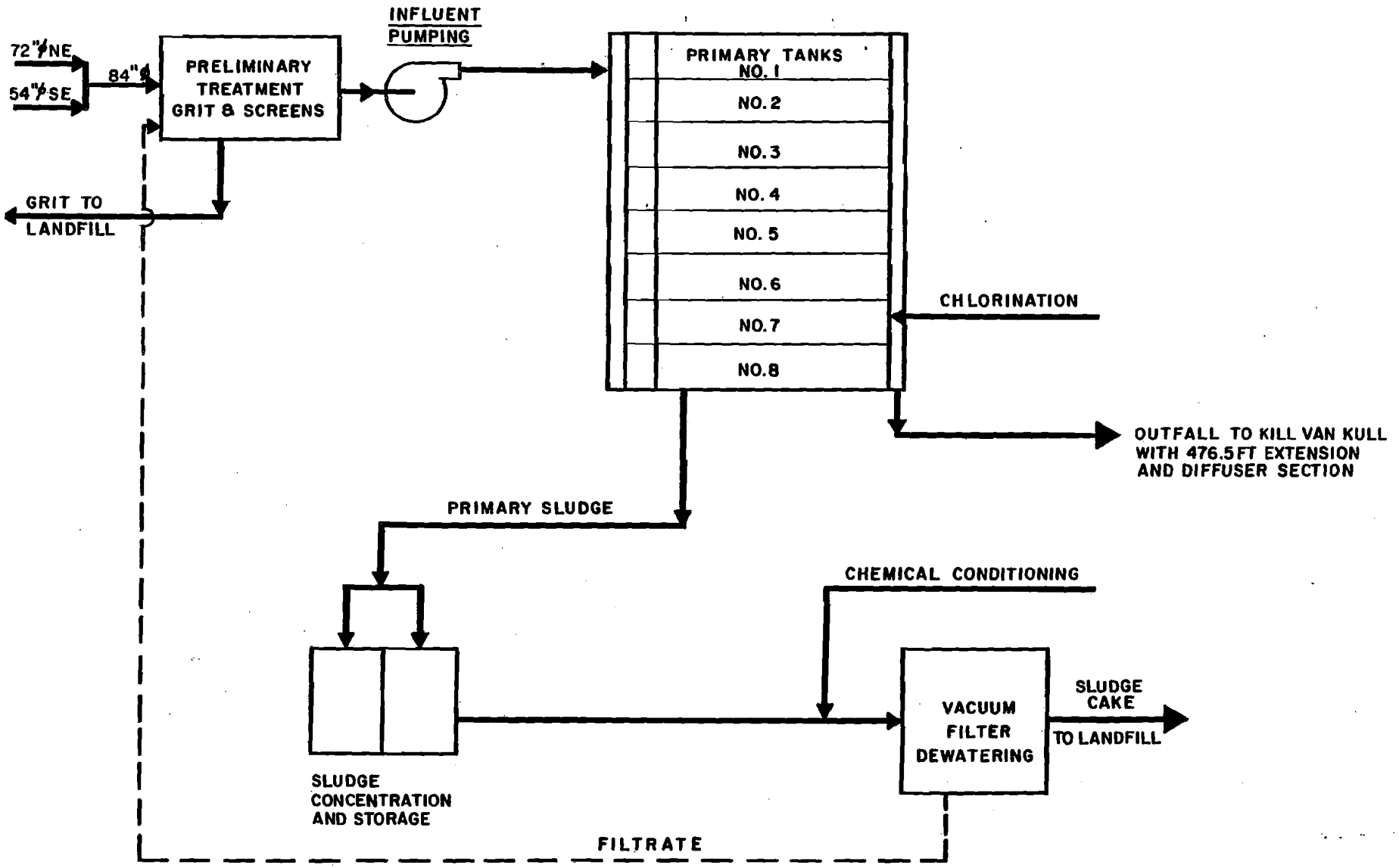
14a Item Number	Information
11	of 2.2 mgd from industrial sources approximately 1.5 mgd is indus-
	trial waste; remainder is sanitary waste only.



BAYONNE 301(h) APPLICATION

EXISTING WASTEWATER COLLECTION AND TREATMENT FACILITIES

HAZEN AND SAWYER, P.C.
Engineers



HAZEN AND SAWYER, P.C.
Engineers

BAYONNE 301(h) APPLICATION

PRESENT BAYONNE STP PROCESS FLOW SCHEMATIC

FORM APPROVED
OMB No. 158-R0100

STANDARD FORM A--MUNICIPAL

FOR AGENCY USE

SECTION II. BASIC DISCHARGE DESCRIPTION

Complete this section for each present or proposed discharge indicated in Section I, items 7 and 8, that is to surface waters. This includes discharges to other municipal sewerage systems in which the waste water does not go through a treatment works prior to being discharged to surface waters. Discharges to wells must be described where there are also discharges to surface waters from this facility. Separate descriptions of each discharge are required even if several discharges originate in the same facility. All values for an existing discharge should be representative of the twelve previous months of operation. If this is a proposed discharge, values should reflect best engineering estimates.

ADDITIONAL INSTRUCTIONS FOR SELECTED ITEMS APPEAR IN SEPARATE INSTRUCTION BOOKLET AS INDICATED. REFER TO BOOKLET BEFORE FILLING OUT THESE ITEMS.

1. **Discharge Serial No. and Name**
   a. **Discharge Serial No.** (see instructions) — 001
   b. **Discharge Name** Give name of discharge, if any (see instructions) — Sewage Treatment Plant
   c. **Previous Discharge Serial No** If a previous NPDES permit application was made for this discharge (Item 4, Section I) provide previous discharge serial number. —

2. **Discharge Operating Dates**
   a. **Discharge to Begin Date** If the discharge has never occurred but is planned for some future date, give the date the discharge will begin. — YR MO
   b. **Discharge to End Date** If the discharge is scheduled to be discontinued within the next 5 years, give the date (within best estimate) the discharge will end. Give reason for discontinuing this discharge in Item 17. — YR MO

3. **Discharge Location** Name the political boundaries within which the point of discharge is located:

		Agency Use
State	New Jersey	
County	Hudson	
(If applicable) City or Town	City of Bayonne	

4. **Discharge Point Description** (see instructions) Discharge is into (check one)

Stream (Includes ditches, arroyos, and other watercourses)	☐ STR
Estuary	☒ EST
Lake	☐ LKE
Ocean	☐ OCE
Well (Injection)	☐ WEL
Other	☐ OTH
If 'other' is checked, specify type	

5. **Discharge Point — Lat/Long.** State the precise location of the point of discharge to the nearest second. (see instructions)

Latitude	40 DEG.	38 MIN.	50 SEC
Longitude	74 DEG.	06 MIN.	52 SEC

DISCHARGE SERIAL NUMBER

001

FOR AGENCY USE

6. **Discharge Receiving Water Name** Name the waterway at the point of discharge.(see instructions)

Kill Van Kull

For Agency Use		
Major	Minor	Sub

For Agency Use
303e

If the discharge is through an outfall that extends beyond the shoreline or is below the mean low water line, complete item 7.

7. **Offshore Discharge**

a. **Discharge Distance from Shore** _____ feet

b. **Discharge Depth Below Water Surface** _____ feet

If discharge is from a bypass or an overflow point or is a seasonal discharge from a lagoon, holding pond, etc., complete items 8, 9 or 10, as applicable, and continue with item 11.

8. **Bypass Discharge** (see instructions)

a. **Bypass Occurrence** Check when bypass occurs

Wet weather ☒ Yes ☐ No

Dry weather ☐ Yes ☒ No

b. **Bypass Frequency** Give the actual or approximate number of bypass incidents per year.

Wet Weather _____ times per year

Dry weather _____ times per year

c. **Bypass Duration** Give the average bypass duration in hours.

Wet weather _____ hours

Dry weather _____ hours

d. **Bypass Volume** Give the average volume per bypass incident, in thousand gallons.

Wet weather _____ thousand gallons per incident

Dry weather _____ thousand gallons per incident

e. **Bypass Reasons** Give reasons why bypass occurs.

_____

_____

_____

Proceed to Item 11.

9. **Overflow Discharge** (see instructions)

a. **Overflow Occurrence** Check when overflow occurs.

Wet weather ☐ Yes ☐ No

Dry weather ☐ Yes ☐ No

b. **Overflow Frequency** Give the actual or approximate incidents per year.

Wet weather _____ times per year

Dry weather _____ times per year

DISCHARGE SERIAL NUMBER

001

FOR AGENCY USE

c. **Overflow Duration** Give the average overflow duration in hours.

Wet weather _____hours

Dry weather _____Hours

d. **Overflow Volume** Give the average volume per overflow incident in thousand gallons.

Wet weather _____thousand gallons per incident

Dry weather _____thousand gallons per incident

Proceed to Item 11

10. **Seasonal/Periodic Discharges**

a. **Seasonal/Periodic Discharge Frequency** If discharge is intermittent from a holding pond, lagoon, etc., give the actual or approximate number of times this discharge occurs per year. _____times per year

b. **Seasonal/Periodic Discharge Volume** Give the average volume per discharge occurrence in thousand gallons. _____thousand gallons per discharge occurrence

c. **Seasonal/Periodic Discharge Duration** Give the average duration of each discharge occurrence in days. _____days

d. **Seasonal/Periodic Discharge Occurrence—Months** Check the months during the year when the discharge normally occurs.

☐ JAN ☐ FEB ☐ MAR
☐ APR ☐ MAY ☐ JUN
☐ JUL ☐ AUG ☐ SEP
☐ OCT ☐ NOV ☐ DEC

11. **Discharge Treatment**

a. **Discharge Treatment Description** Describe waste abatement practices used on this discharge with a brief narrative. (See instructions)

Grit removal, primary sedimentation, vacuum filtration of primary sludge and land disposal of sludge cake. Chlorination after primary sedimentation.

DISCHARGE SERIAL NUMBER

001

FOR AGENCY USE

b. Discharge Treatment Codes
Using the codes listed in Table I of the Instruction Booklet, describe the waste abatement processes applied to this discharge in the order in which they occur, if possible.
Separate all codes with commas except where slashes are used to designate parallel operations.

S,SC, C, T,/VV DN/PG, XN

If this discharge is from a municipal waste treatment plant (not an overflow or bypass), complete items 12 and 13

12. Plant Design and Operation Manuals
Check which of the following are currently available

a. Engineering Design Report ☐

b. Operation and Maintenance Manual ☐

13. Plant Design Data (see instructions)

a. Plant Design Flow (mgd) 21(1) mgd

b. Plant Design BOD Removal (%) 40 %

c. Plant Design N Removal (%) _____ %

d. Plant Design P Removal (%) _____ %

e. Plant Design SS Removal (%) 50 %

f. Plant Began Operation (year) 1954

g. Plant Last Major Revision (year) _____

Proposed Effluent Limitations(1)
Under 301(h) Modification

	30-Day Mean	7-day Mean
BOD_5 - mg/l	165	247
- % Removal	40	-
S.S. - mg/l	140	210
- % Removal	50	-

(1) Projected DWF = 11.0 mgd (HCUA 201 Facility Plan)
For Wasteload Projections see Exhibit IIA-2 in the 301(h) Application.

DISCHARGE SERIAL NUMBER

001

FORM APPROVED
OMB No. 158-R0100

FOR AGENCY USE

14. Description of Influent and Effluent (see instructions)

PRESENT PLANT PERFORMANCE

Parameter and Code 214	Influent	Effluent					
	Annual Average Value (1)	Annual Average Value (2)	Lowest Monthly Average Value (3)	Highest Monthly Average Value (4)	Frequency of Analysis (5)	Number of Analyses (6)	Sample Type (7)
Flow Million gallons per day 50050	11.9	11.9	9.6	14.1	7/7		
pH Units 00400	X	X	6.0	9.0	5/7		
Temperature (winter) ° F 74028							
Temperature (summer) ° F 74027							
Fecal Streptococci Bacteria Number/100 ml 74054 (Provide if available)	X	X	X				
Fecal Coliform Bacteria Number/100 ml 74055 (Provide if available)	X	X	X				
Total Coliform Bacteria Number/100 ml 74056 (Provide if available)	X	X	X				
BOD 5-day mg/l 00310	261	140	110	171	5/7		
Chemical Oxygen Demand (COD) mg/l 00340 (Provide if available)							
OR							
Total Organic Carbon (TOC) mg/l 00680 (Provide if available) (Either analysis is acceptable)							
Chlorine--Total Residual mg/l 50060		1.0					

DISCHARGE SERIAL NUMBER

001

FOR AGENCY USE

14. Description of Influent and Effluent (see instructions) (Continued)

PRESENT PLANT PERFORMANCE

Parameter and Code	Influent	Effluent					
	Annual Average Value (1)	Annual Average Value (2)	Lowest Monthly Average Value (3)	Highest Monthly Average Value (4)	Frequency of Analysis (5)	Number of Analyses (6)	Sample Type (7)
Total Solids mg/l 00500							
Total Dissolved Solids mg/l 70300							
Total Suspended Solids mg/l 00530	115*	66	45	91	5/7		
Settleable Matter (Residue) ml/l 00545							
Ammonia (as N) mg/l 00610 (Provide if available)							
Kjeldahl Nitrogen mg/l 00625 (Provide if available)							
Nitrate (as N) mg/l 00620 (Provide if available)							
Nitrite (as N) mg/l 00615 (Provide if available)							
Phosphorus Total (as P) mg/l 00665 (Provide if available)							
Dissolved Oxygen (DO) mg/l 00300							

* 283 mg/1 projected in HCUA 201 Facility Plan,
See Exhibit IIA-2 of 301(h) Application.

DISCHARGE SERIAL NUMBER

001

FOR AGENCY USE

15. Additional Wastewater Characteristics

Check the box next to each parameter if it is present in the effluent. (see instructions)

Parameter (215)	Present	Parameter (215)	Present	Parameter (215)	Present
Bromide 71870		Cobalt 01037		Thallium 01059	
Chloride 00940		Chromium 01034		Titanium 01152	
Cyanide 00720		Copper 01042		Tin 01102	
Fluoride 00951		Iron 01045		Zinc 01092	
Sulfide 00745		Lead 01051		Algicides* 74051	
Aluminum 01105		Manganese 01055		Chlorinated organic compounds* 74052	
Antimony 01097		Mercury 71900		Oil and grease 00550	
Arsenic 01002		Molybdenum 01062		Pesticides* 74053	
Beryllium 01012		Nickel 01067		Phenols 32730	
Barium 01007		Selenium 01147		Surfactants 38260	
Boron 01022		Silver 01077		Radioactivity* 74050	
Cadmium 01027	X				

*Provide specific compound and/or element in Item 17, if known.

Pesticides (Insecticides, fungicides, and rodenticides) must be reported in terms of the acceptable common names specified in *Acceptable Common Names and Chemical Names for the Ingredient Statement on Pesticide Labels*, 2nd Edition, Environmental Protection Agency, Washington, D.C. 20250, June 1972, as required by Subsection 162.7(b) of the Regulations for the Enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act.

DISCHARGE SERIAL NUMBER

001

FOR AGENCY USE

16. **Plant Controls** Check if the following plant controls are available for this discharge

Alternate power source for major pumping facility including those for collection system lift stations ☐ APS

Alarm for power or equipment failure ☐ ALM

17. **Additional Information**

Item Number	Information
8a	Bypass occurs through 18 regulators and 1st Street pump station of combined sewer overflows. (Discharge No. 003 through 021 this application).
	Discharge 002 is storm pump station (no sanitary wastes).
15	Cadmium levels in the plant effluent ranges between 5 to 40 ug/l with average of about 15 ug/1.

*U. S. GOVERNMENT PRINTING OFFICE : 1973 O - 508-432

2. CURRENT NPDES PERMIT

Permit Number: NJ0025836

Name of Permittee: City of Bayonne

Effective Date: EDP* Dec. 31 '78

Expiration Date: EDP + 5 years

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT TO DISCHARGE

In reference to the application received from the above-mentioned permittee for a permit authorizing the discharge of pollutants in compliance with the provisions of the Clean Water Act, as amended by the Clean Water Act Amendments of 1977, P.L. 95-217, (33 U.S.C. §§1251-1376) (hereinafter referred to as "the Act").

DRAFT

City of Bayonne
630 Avenue C
Bayonne, New Jersey 07002

(hereinafter referred to as "the Permittee")

is authorized by the Regional Administrator, Region II, U.S. Environmental Protection Agency (EPA), to discharge from:

Bayonne Sewage Treatment Plant

located at the Foot of Oak Street, Bayonne, New Jersey

and other locations noted herein

to receiving waters named Kill Van Kull and other waters noted herein

in accordance with the following conditions.

*Effective date of the permit

A. GENERAL CONDITIONS

1. All dischargers authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant more frequently than, or at a level in excess of, that identified and authorized by this permit shall constitute a violation of the terms and conditions of this permit. Such a violation may result in the imposition of civil and/or criminal penalties as provided for in Section 309 of the Act. Facility modifications, additions, and/or expansions that increase the plant capacity must be reported to the permitting authority and this permit then modified or re-issued to reflect such changes. Any anticipated change in the facility discharge, including any new significant industrial discharge or significant changes in the quantity or quality of existing industrial discharges to the treatment system that will result in new or increased discharges of pollutants must be reported to the Regional Administrator. Modifications to the permit may then be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. In no cases are any new connections, increased flows, or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein.

2. After notice and opportunity for a hearing, this permit may be modified, suspended or revoked in whole or in part during its term for cause including, but not limited to, the following:

   a. violation of any terms or conditions of this permit;
   b. obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or,
   c. a change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

3. Notwithstanding 2 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge authorized herein and such standard or prohibition is more stringent than any limitation upon such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee shall be so notified.

4. The permittee shall allow the head of the State water pollution control agency, the Regional Administrator and/or their authorized representative, upon the presentation of credentials:

a. to enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit;

b. to have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit;

c. to inspect at reasonable times any monitoring equipment or monitoring method required in this permit; or,

d. to sample at reasonable times any discharge of pollutants,

e. to inspect the operation of the treatment facilities.

5. The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, state, or local laws or regulations; nor does it obviate the necessity of obtaining State or local assent required by law for the discharge authorized.

6. This permit does not authorize or approve the construction of any onshore or offshore physical structures of facilities or the undertaking of any work in any navigable waters.

7. Except for data determined to be confidential under Section 308 of the Act, all monitoring reports required by this permit shall be available for public inspection at the offices of the head of the State water pollution control agency and the Regional Administrator. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act.

Notification

8. The diversion or bypass of any discharge from the treatment works by the permittee is prohibited, except: (1) where unavoidable to prevent loss of life or severe property damage; or (2) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the terms and conditions of this permit. The permittee shall notify the Regional Administrator in writing within 72 hours of each diversion or bypass in accordance with the procedure specified above for reporting non-compliance. Within 30 days after such incident the permittee shall submit to EPA for approval a plan to prevent recurrence of such incidents. Normal operation of overflows and bypasses (listed in Section B.6.) should not be reported under the requirements of this condition. The notification and plan herein required apply only to discharges resulting from unusual situations such as breakdowns, power failures, and bypasses occurring during dry weather periods. A summary description of discharges from bypass points should be submitted with the permittee's quarterly self-monitoring reports.

9. If for any reason the permittee does not comply with or will be unable to comply with any effluent limitation specified in this permit, or should any unusual or extraordinary discharge of wastes occur from the facilities herein permitted, the permittee shall immediately notify the Regional Administrator and appropriate State agency by telephone and provide the same authorities with the following information in writing within five (5) days of such notification:

   a. A description of the non-complying discharge including its impact upon the receiving waters.
   b. Cause of non-compliance.
   c. Anticipated time the condition of non-compliance is expected to continue, or if such condition has been corrected, the duration of the period of non-compliance.
   d. Steps taken by the permittee to reduce and eliminate the non-complying discharge.
   e. Steps to be taken by the permittee to prevent recurrence of the condition of non-compliance.

10. The permittee shall take all reasonable steps to minimize any adverse impace to navigable waters resulting from non-compliance with any effluent limitation specified in this permit. The permittee will also provide accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.

11. Except as provided in permit condition 8 on bypassing, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for non-compliance.

12. Nothing in this permit shall be construed to preclude the institution of any legal action nor relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

13. In the event of any change in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State water pollution control agency.

14. The provisions of this permit are severable, and if any provision of this permit, or the application of any provisions of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

15. The permittee shall provide notice to the Regional Administrator of the following:

    a. Any new introduction of pollutants into such treatment works from a source which would be a new source as defined in Section 306 of the Act if such source were discharging pollutants;
    b. Any new introduction of pollutants which exceeds 10,000 gallons on any one (1) day into such treatment works from a source which would be subject to Section 301 of the Act if such source were discharging pollutants; and,
    c. Any substantial change in volume or character of pollutants being introduced into such treatment works by a source introducing pollutants into such works at the time of issuance of the permit.

    Such notice shall include information on the quality and quantity of effluent to be introduced into such treatment works; and an anticipated impact of such change in the quantity or quality of effluent to be discharged from such publicly owned treatment works.

16. The permittee shall require any industrial user of such treatment works to comply with the requirements of Section 204(b), 307 and 308 of the Act. Any industrial user subject to the requirements of Section 307 of the Act shall be required by the permittee to prepare and transmit to the Regional Administrator periodic notice (over intervals not to exceed nine (9) months) of progress toward full compliance with Section 307 requirements.

17. The permittee shall require any industrial user of storm sewers to comply with the requirement of Section 308 of the Act.

18. The permittee shall comply with Sections 201(b) through 201(g) of the Act.

B. REQUIRED EFFLUENT LIMITATIONS AND MONITORING AND OPERATIONAL REQUIREMENTS

1.A. Required Effluent Limitations

During the period beginning on the date determined by Condition C-II and lasting until the expiration date of this permit, discharges shall be limited and monitored by the permittee as specified below:

a. A substantially complete removal of settleable solids shall be achieved.

b. See Table I.

c. Except as specifically authorized in this permit, the permittee shall not discharge floating solids or visible foam.

d. The effluent values for pH shall remain within the limits of 6.0 to 9.0.

e. The 30-day average quantity of effluent discharged from the wastewater treatment facility shall not exceed 10.0 million gallons per day (MGD). ?

f. See Section C.I.

1.B. Interim Effluent Limitations

During the period beginning on the effective date of this permit and lasting until the date determined by Condition C-II, discharges shall be limited and monitored by the permittee as specified below:

a. Same as permit Condition B.1.A.a.

b. See Table I-A.

c. Same as permit Condition B.1.A.c.

d. Same as permit Condition B.1.A.d.

e. The 30 day average quantity of effluent discharged from the wastewater treatment facility shall not exceed 21.0 MGD.

2. Facility Operation and Quality Control

All waste collection, control, treatment and disposal facilities shall be operated in a manner consistent with the following:

a. At all times, all facilities shall be maintained as efficiently as possible and operated as efficiently as possible and in a manner which will minimize upsets and discharges of excessive pollutants.

b. The permittee shall provide an adequate operating staff which is duly qualified to carry out the operation, maintenance and testing functions required to insure compliance with the conditions of this permit.

c. Maintenance of treatment facilities that results in degradation of effluent quality shall be scheduled during non-critical water quality periods and shall be carried out in a manner subject to approval by the permitting authority.

d. Prohibited Wastes

The permittee shall under no circumstances allow introduction of wastes into the treatment works identified as "Prohibited Wastes" pursuant to Section 307 of the Act. The following wastes are prohibited as published in 40 CFR 128:

(i) Wastes which create a fire or explosion hazard in the publicly owned treatment works.

(ii) Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is designed to accomodate such wastes.

(iii) Solid or viscous wastes in amounts which would cause obstruction to the flow in sewers, or other interference with the proper operation of the publicly owned treatment works.

(iv) Wastes at a flow rate and/or pollutant discharge rate which is excessive over relatively short time periods so that there is a treatment process upset and subsequent loss of treatment efficiency.

3. Self-Monitoring and Reporting Requirements

a. The permittee shall effectively monitor the operation and efficiency of all treatment and control facilities and the quantity and quality of the treated discharge. Monitoring data required by this permit shall be summarized on an average calendar month basis. The monthly summaries of data will then be used to prepare a single quarterly report. Duplicate original copies of the Discharge Monitoring Report form (EPA Form T-40), properly completed and signed by the permittee must be submitted within 28 days after the end of each report period to the Regional Administrator and the State agency at the following addresses:

Status of Compliance Branch
Environmental Protection Agency
Region II
26 Federal Plaza
New York, New York 10007

Assistant Director
Pollution Control, Monitoring,
Surveillance and Enforcement Element
Division of Water Resources
New Jersey State Department of
Environmental Protection
P.O. Box 2809
Trenton, New Jersey 08625

Quarterly reports will be required for periods beginning on the first day of the first month following the issuance of this permit. The data collected and submitted shall include the parameters and testing frequencies specified in Table II. Samples and measurements of the effluent taken to achieve compliance with the monitoring requirements specified above shall be taken at the point of combined flow into the outfall sewer.

Samples and measurements of the influent wastewater taken to meet the monitoring requirements specified above shall be taken at the point of plant inflow.

b. Sampling and Analysis Methods

Other measurements of oxygen demand can be substituted for Bio-chemical Oxygen Demand (BOD) where the permittee can demonstrate long-term correlation of the method with BOD values. Substitution of such measurements must receive prior approval of the permitting authority.

The analytical and sampling methods used shall conform to the regulations published pursuant to Section 304(g) of the Act. These regulations are published in the Federal Register as 40 CFR Part 136. However, different but equivalent methods are allowable if they receive the prior written approval of the permitting authority.

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to insure accuracy of measurements.

4. Recording

The permittee shall record for all samples the date and time of sampling, the sampling method used, the date analyses were performed, the identity of the analysts, and the results of all required analyses and measurements.

All sampling and analytical records mentioned in the preceding paragraph shall be retained for a minimum of three (3) years. The permittee shall also retain all original recordings from any continuous monitoring instrumentation, and any calibration and maintenance records, for a minimum of three (3) years. These periods will be extended during the course of any unresolved litigation, or when so requested by the permitting authority.

5. Solids Disposal

Collected screenings, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent such materials from entering the waters of the United States except in accordance with a permit issued under Section 405 of the Act. If for any reason such materials do enter the waters of the United States, the permittee shall notify the permitting authority with the following information in writing within 14 days:

1. Dates of the occurrence;
2. A description of the non-complying discharge (nature and volume);
3. Cause of non-compliance;
4. Steps taken to reduce and eliminate the non-complying discharge; and,
5. Steps to be taken to prevent recurrence of the condition of non-compliance.

6. Discharge Location Description

Treated effluent is discharged through one outfall (Discharge 001) into Kill Van Kull. Since the permittee's collection system consists of separate storm and combined sewers, overflows from this system have been recorded during periods of wet weather. Listed below and on the following page are the discharge serial number, name, U.S.G.S. coordinates and the receiving waters of each point of discharge authorized herein in accordance with the terms and conditions of this permit.

Discharge Type and Serial Number	Discharge Location Discription U.S.G.S. Coordinates, Receiving Waters
Treatment Plant Outfall 001	40°38'57" North, 74°06'55" West Kill Van Kull
Storm Water Pump Station 002	40°38'57" North, 74°07'01" West Kill Van Kull
Combined Sewer Relief Overflow 003	1st Street Relief Pump Station 40°38'43" North, 74°08'00" West Kill Van Kull
Combined Sewer Overflow 004	E. 19th Street Regulator No. 1 40°39'02" North, 74°06'39" West Kill Van Kull
Combined Sewer Overflow 005	E. 15th Street Regulator No. 2 40°38'57" North, 74°06'55" West Kill Van Kull
Combined Sewer Overflow 006	E. 30th Street Regulator No. 3 40°40'00" North, 74°06'31" West Upper New York Bay
Combined Sewer Overflow 007	E. 34th Street Regulator No. 4 40°40'13" North, 74°06'26" West Upper New York Bay
Combined Sewer Overflow 008	E. 5th Street Regulator No. 5 40°38'46" North, 74°07'14" West Kill Van Kull
Combined Sewer Overflow 009	Broadway and E. 1st Street Regulator No. 6 40°38'41" North, 74°07'42" West Kill Van Kull

Discharge Type and Serial Number (cont.)	Discharge Location Description U.S.G.S. Coordinates, Receiving Waters
Combined Sewer Overflow 010	Avenue C and E. 1st Street, Regulator No. 7 40°38'41" North, 74°07'52" West Kill Van Kull
Combined Sewer Overflow 011	West 3rd Street, Regulator No. 8 40°39'04" North, 74°08'33" West Newark Bay
Combined Sewer Overflow 012	West 5th Street, Regulator No. 9 40°39'13" North, 74°08'25" West Newark Bay
Combined Sewer Overflow 013	Edwards Court Regulator No. 10 40°39'37" North, 74°07'58" West Newark Bay
Combined Sewer Overflow 014	West 16th Street, Regulator No. 11 40°39'50" North, 74°07'59" West Newark Bay
Combined Sewer Overflow 015	West 22th Street, Regulator No. 12 40°40'02" North, 74°07'40" West Newark Bay
Combined Sewer Overflow 016	West 24th Street, Regulator No. 13 40°40'10" North, 74°07'40" West Newark Bay
Combined Sewer Overflow 017	West 25th Street, Regulator No. 14 40°41'14" North, 74°07'39" West Newark Bay
Combined Sewer Overflow 018	West 30th Street, Regulator No. 15 40°40'24" North, 74°07'22" West Newark Bay
Combined Sewer Overflow 019	Lincoln Parkway Regulator No. 16 40°40'35" North, 74°07'09" West Newark Bay
Combined Sewer Overflow 020	West 59th Street, Regulator No. 17 40°41' 24" North, 74°06'29" West Newark Bay
Combined Sewer Overflow 021	East 50th Street, Regulator No. 18 40°40'41" North, 74°05'45" West Upper New York Bay

TAB I

REQUIRED EFFLUENT LIMITATIONS (Discharge No. 001)

After Completion of Upgrading

Effluent Characteristics	Discharge Load Allocations				Discharge* Concentrations Limitations		Minimum* Percent Removal Limitations
	30 Consecutive Day Average		7 Consecutive Day Average		30 Day Average (mg/l)	7 Day Average (mg/l)	30 Day Average
	lb/day	kg/day	lb/day	kg/day			
5-Day-20 °C Biochemical Oxygen Demand	2502	1136	3753	1704	30	45	85%
Suspended Solids	2502	1136	3753	1704	30	45	85%

Fecal Coliform levels shall not exceed 200 per 100 ml at any time.

*whichever is more stringent

Now *

TABLE 1

INTERIM EFFLUENT LIMITATIONS (Discharge No. 001)

Effluent Characteristics	Discharge Load Allocations				Discharge* Concentrations Limitations		Minimum* Percent Removal Limitations
	30 Consecutive Day Average		7 Consecutive Day Average		30 Day Average (mg/l)	7 Day Average (mg/l)	30 Day Average
	lb/day	kg/day	lb/day	kg/day			
5-Day-20 °C Biochemical Oxygen Demand	17514	7951	26271	11927	100	150	45%
Suspended Solids	15763	7156	23644	10734	90	135	55%

Fecal Coliform levels shall not exceed 200 per 100 ml at any time.

*whichever is more stringent

Table II - Self-Monitoring Requirements 1/
(Discharge 001)

Parameter	Minimum Monitoring Requirements Measurement Frequency	Sample Type
Total Flow, mgd	continuous	N/A
BOD_5, mg/l	daily	24-hour composite
BOD_5, lbs/day*	----------	----
Settleable Solids, ml/l	six times per day	grab
Suspended Solids, mg/l	daily	24-hour composite
Suspended Solids, lbs/day*	----------	----
Residual Chlorine, mg/l 2/	six times per day	grab
Fecal Coliform, N per 100 ml 2/	daily	grab
pH	six times per day	grab
Temperature, °C 2/	six times per day	grab
Total Cadmium, mg/l 2/	twice per week	24-hour composite

1/ Except where indicated, influent and effluent measurement and testing are required.

2/ Only effluent testing required.

* To be determined based on actual flow and actual testing results for parameters noted.

C.I. STATE CERTIFIED REQUIREMENTS

As required by the New Jersey State Department of Environmental Protection (NJSDEP) Certifications of June 29, 1977 and August 11, 1977 for the purpose of assuring compliance with New Jersey's water quality standards and other appropriate requirements of State law as provided by Section 401(d) of the Act, the permittee shall comply with the following effluent limitations and other limitations:

1. The permittee shall discharge so as not to violate the Surface Water Quality Standards for the waters classified as follows according to N.J.A.C. 7:9-4 et. seq.:

Discharge No.	Receiving Stream	Classification
001 to 005 008 to 010	Kill Van Kull	"TW-3"
006, 007, 021	Upper New New York Bay	"TW-2"
011 to 020	Newark Bay	"TW-3"

2. Pursuant to N.J.A.C. 7:9-4.4(a)(13), effective year-round disinfection shall be required for all treated wastewater discharges containing pathogenic organisms.

3. The permittee shall discharge so as not to violate the Interstate Sanitation Commission (I.S.C.) Water Quality Regulations promulgated pursuant to the authority conferred upon the I.S.C. by the Tri-State Compact (N.J.S.A. 32:18-1 et. seq.).

   The I.S.C. Water Quality Regulations include, but are not limited to, the following provision:

   > Fecal coliform levels shall not exceed 200 per 100 ml., at any time when disinfection is required to protect the best intended uses of the waters in question. *

4. The permittee shall conform with the Water Quality Management Basin Plan for the Northeast New Jersey Urban Area in accordance with Section 303(e) of the Act which currently contains the following discharge conditions:

	Effluent Limitations	
	BOD_5	TSS
30 day average concentration, mg/l	30	30
7 day average concentration, mg/l	45	45
30 day average load, kg/day(lb/day)	1136(2502)	1136(2502)
7 day average load, kg/day(lb/day)	1704(3753)	1704(3753)
Minimum Percent Removal	85	85

The 30 day average quantity of effluent discharged from the wastewater treatment facility shall not exceed 10 million gallons per day (MGD) as per the projected Year 2000 Design Capacity for Treatment Level 1.

5. a. The permittee shall provide information in answer to reasonable requests by the Hudson County Sewerage Authority for data to be used in the development of the 201 Facilities Plan, and shall otherwise cooperate in the development of that Plan.

   b. The permittee shall conform to such Facilities Plan developed by the Hudson County Sewerage Authority(HCSA).

C.II. Schedule of Compliance to Attain Required Effluent Limitation 1/ 2/ 3/

The permittee has indicated that the level of treatment currently being afforded the discharge is not meeting the level of treatment as provided for in Section 301(b)(1)(B) and (C) of the Act, and has requested a time extension under Section 301(i) of the Act. Upon review of all the facts presented in this matter, the EPA hereby grants such a time extension provided that the permittee shall comply with the following schedule and shall report to the Regional Administrator and the State Agency within 14 days following each date on the schedule detailing its compliance or non-compliance.

1. The permittee shall comply with the approved recommendations of the Facilities Plan prepared by the HCSA.

2. If the Facilities Plan, as approved by the Regional Administrator and the NJSDEP, requires the abandonment of the permittee's treatment facilities and the diversion of sewage flows to a regional treatment facility, the permittee shall comply with the following:

   a. Sign a Service Agreement with the HCSA within three (3) months of the approval of the Facilities Plan.

   b. Abandon its treatment facilities as soon as possible but in no case later than June 30, 1983.

3. If the Facilities Plan, as approved by the Regional Administrator and the NJSDEP, requires the expansion and upgrading of the permittee's existing treatment facilities to serve as a regional treatment plant, the permittee shall comply with the following:

   a. Sign a Service Agreement with the HCSA within three (3) months of the approval of the Facilities Plan.

   b. Transfer ownership of its existing treatment facilities to the HSCA within six (6) months of the approval of the Facilities Plan.

4. Upon completion of ownership transfer, this permit shall be modified to include a compliance schedule and any revised effluent limitations which the HCSA must meet by July 1, 1983.

1/ If at any time, it is determined that Federal funding will not be available in time to assure compliance by July 1, 1983 with the final effluent limitations contained in this permit, this time extension shall be revoked by the Regional Administrator.

2/ If the time period allotted for the completion of an interim requirement specified above is greater than 9 months, then the permittee shall submit a report detailing its progress toward completion of the interim requirement at the end of the first 9-month period and at the end of each succeeding 9-month period (including of course, the report, specified above, required within 14 days following the specified completion date).

3/ Each notice of non-compliance shall include:

A. A short description of the non-compliance;
B. A description of any actions taken or proposed by the permittee to comply with the elapsed schedule requirement without further delay;
C. A description of any factors which tend to explain or mitigate the non-compliance;
D. An estimate of the date the permittee will comply with the elapsed schedule requirement and an assessment of the probability that the permittee will meet the next schedule requirement on time.

C.III. SPECIAL PERMIT CONDITIONS FOR PUBLICLY-OWNED TREATMENT WORKS COMBINED SEWER OVERFLOWS AND/OR BYPASSES

1. General Requirements

   a. The permittee shall operate the treatment works, including the treatment plant and total sewer system to minimize discharge of the pollutants listed in the permit from combined sewer overflows or bypasses.

   b. No new sources of stormwater inflow shall be connected to any separate sanitary sewers in the sewer system.

2. Overflow Monitoring Program and Abatement Study 1/

   Combined sewer overflow discharges within the City of Bayonne will be included within an overflow monitoring and overflow control feasibility study to be coordinated by the HCSA utilizing State and Federal construction grant funds.

Time Limitation
3 Months.

* By three (3) months from effective date of this permit, the permittee shall submit to the NJSDEP and the EPA Regional Administrator a resolution of intent to cooperate with the regional authority HCSA in developing and implementing the overflow monitoring and overflow control feasibility study.

1/ It is the intent of this permit to eliminate the discharge of untreated wastewater from the City of Bayonne's combined sewer system. It is not the intent of this permit to delay planned sewer work. Existing programs to either eliminate or treat all of the discharges contained herein should proceed as planned.

SCHEDULE OF COMPLIANCE FOR INDUSTRIAL DISCHARGE INFORMATION

The permittee shall prevent the introduction into its system of pollutants which would interfere with the attainment of the effluent limitations contained in this permit.

Each Major Contributing Industry* (MCI) as defined by Federal pretreatment standards and regulations must be identified as to industrial characterization (including name, location, and production data, and S.I.C. Code) and qualitative and quantitative characteristics of its effluent. This descriptive data have been submitted to the permitting authority on the Standard Form A - Section IV . (Blank form attached)

Time Limitation

* On the first day of the months of July and January the permittee shall submit an update of this inventory indicating any major changes in the qualative or quantative characteristics of the industrial effluents. This permit may be modified to remove this requirement when revised final pretreatment standards are promulgated under 40 CFR 403.

If pretreatment of the industrial waste is currently provided by any of the above industries, this information with complete details should be submitted to the Regional Administrator and the State Agency.

*A major contributing industry is one that: (a) has a flow of 50,000 gallons or more per average workday; (b) has a flow greater than five percent of the flow carried by the municipal system receiving the waste; (c) has in its waste a toxic pollutant in toxic amounts as defined in standards issued under Section 307(a) of the Act; or (d) has significant impact, either singly or in combination with other contributing industries, on the treatment works or the quality of its effluent.

FORM APPROVED
OMB No. 158—R0100

FOR AGENCY USE

STANDARD FORM A—MUNICIPAL

SECTION IV. INDUSTRIAL WASTE CONTRIBUTION TO MUNICIPAL SYSTEM

Submit a description of each major industrial facility discharging to the municipal system, using a separate Section IV for each facility description. Indicate the 4 digit Standard Industrial Classification (SIC) Code for the industry, the major product or raw material, the flow (in thousand gallons per day), and the characteristics of the wastewater discharged from the industrial facility into the municipal system. Consult Table III for standard measures of products or raw materials. (see instructions)

1. **Major Contributing Facility** (see instructions)

Name	401a	
Number & Street	401b	
City	401c	
County	401d	
State	401e	
Zip Code	401f	

2. **Primary Standard Industrial Classification Code** (see instructions) — 402

3. **Principal Product or Raw Material** (see instructions)

			Quantity		Units (See Table III)
Product	403a	403c		403e	
Raw Material	403b	403d		403f	

4. **Flow** Indicate the volume of water discharged into the municipal system in thousand gallons per day and whether this discharge is intermittent or continuous.

404a _____ thousand gallons per day

404b ☐ Intermittent (int) ☐ Continuous (con)

5. **Pretreatment Provided** Indicate if pretreatment is provided prior to entering the municipal system

405 ☐ Yes ☐ No

6. **Characteristics of Wastewater** (see instructions)

	Parameter Name							
406a	Parameter Number							
406b	Value							

The issuance of this permit shall in no way negate, modify or affect the requirements of Condition A(5) of this permit. The issuance of the permit does not represent a decision or recommendation on the part of the U.S. Environmental Protection Agency as to the desireability or legality of the construction by the permittee of facilities, buildings or other structures of whatever type.

This permit shall become effective on EDP.

This permit and the authorization to discharge shall be binding upon the permittee and any successors in interest of the permittee and shall expire at midnight five (5) years from the effective date of this permit. The permittee shall not discharge after the above date of expiration. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information, forms and fees as are required by the agency authorized to issue NPDES permits no later than 180 days prior to the above date of expiration.

By authority of Eckardt C. Beck
(Regional Administrator)

(Date)

(Signature)
Meyer Scolnick
Director
Enforcement Division

BAYONNE 301(h) APPLICATION
APPENDIX 1
INTERSTATE SANITATION COMMISSION
1978-79 BOAT SURVEY DATA

INTERSTATE SANITATION COMMISSION

1978 - 1979 BOAT SURVEY DATA

PARAMETER	ARTHUR KILL	KILL VAN KULL	NEWARK BAY	RARITAN BAY	SANDY HOOK BAY	JAMAICA BAY
Temperature (C) (Summer)						
Low	19.5	18.5	20.0	19.0	18.0	19.5
High	31.5	27.0	27.0	26.0	25.0	26.0
No. of Values	20	5	15	15	10	20
Temperature (C) (Winter)						
Low	1.8	1.5	1.5	1.0	1.5	1.0
High	1.8	1.5	1.8	1.8	1.5	2.0
No. of Values	2	1	3	3	2	5
Dissolved Oxygen (Summer)						
Low	3.0	2.6	4.2	3.2	5.4	4.8
High	9.6	6.0	6.4	10.4	11.2	8.0
No. of Values	16	4	12	12	8	20
Dissolved Oxygen (Winter)						
Low	7.8	8.4	8.6	9.2	9.6	11.2
High	8.4	8.4	8.8	9.6	10.0	12.0
No. of Values	4	1	3	3	2	5
BOD (5 day) (Summer)						
Low	1.0	1.6	2.0	0.4	0.2	1.7
High	5.4	2.4	>4.8	4.4	4.4	4.4
No. of Values	11	3	9	9	6	8
BOD (5 day) (Winter)						
Low	4.7	-	5.5	4.0	2.7	4.0
High	5.3	-	6.5	4.0	2.7	4.2
No. of Values	2	-	2	1	1	3

NOTES: (1) All units are milligrams per liter unless otherwise shown.

(2) Data are for October 1978 through September 1979. Summer data are for July, August and September; winter data are for December, January and February.

INTERSTATE SANITATION COMMISSION

1978 - 1979 BOAT SURVEY DATA

PARAMETER	ARTHUR KILL	KILL VAN KULL	NEWARK BAY	RARITAN BAY	SANDY HOOK BAY	JAMAICA BAY
Turbidity (NTU)						
Low	3	2	2	2	2	2
High	27	11	12	15	11	5
No. of Values	47	12	36	36	24	49
Chlorophyll a						
Low	0.000	0.000	0.000	0.000	0.000	0.000
High	0.040	0.005	0.030	0.112	0.033	0.083
No. of Values	22	6	16	17	11	29
Chlorophyll b						
Low	0.000	0.000	0.000	0.000	0.000	0.000
High	0.004	0.003	0.006	0.003	0.001	0.002
No. of Values	22	6	16	17	11	29
Chlorophyll c						
Low	0.000	0.000	0.000	0.000	0.000	0.000
High	0.015	0.006	0.020	0.046	0.024	0.040
No. of Values	22	6	16	17	11	29
Total Carbon						
Low	25	27	27	23	24	27
High	45	37	40	37	35	40
No. of Values	39	10	30	30	20	44
Total Org. Carbon						
Low	3	1	7	2	2	4
High	20	13	17	15	14	16
No. of Values	39	10	30	30	20	44

NOTES: (1) All units are milligrams per liter unless otherwise shown.

(2) Data are for October 1978 through September 1979.

APPENDIX 1 (Cont'd)

INTERSTATE SANITATION COMMISSION

1978 - 1979 BOAT SURVEY DATA

PARAMETER	ARTHUR KILL	KILL VAN KULL	NEWARK BAY	RARITAN BAY	SANDY HOOK BAY	JAMAICA BAY
Fecal Coli (/100 ml) (Summer)						
Low	270	2200	390	10	<10	10
High	41000	4100	700	400	20	550
No. of Values	10	2	3	4	3	7
Fecal Coli (/100 ml) (Winter)						
Low	3600	-	-	500	390	-
High	4600	-	-	1900	390	-
No. of Values	2	-	-	3	1	-
Total Coli (/100 ml) (Summer)						
Low	810	6100	1200	<100	<100	<100
High	>100000	6100	1700	5700	270	>100000
No. of Values	8	1	3	6	3	5
Total Coli (/100 ml) (Winter)						
Low	32000	-	-	20000	37000	-
High	62000	-	-	59000	37000	-
No. of Values	2	-	-	3	1	-
pH (Standard Units)						
Low	6.7	6.9	6.9	6.7	7.0	7.3
High	7.6	7.6	7.4	7.6	8.1	8.4
No. of Values	46	12	36	36	24	50
Conductivity (umhos/cm)						
Low	18000	18000	11000	23000	23000	35000
High	41000	43500	39500	42000	42500	49000
No. of Values	43	11	33	33	22	45

NOTES: (1) Units are as shown.

(2) Data are for October 1978 through September 1979. Summer data are for July, August and September; winter data are for December, January and February.

APPENDIX 1 (Cont'd)

INTERSTATE SANITATION COMMISSION

1978 - 1979 BOAT SURVEY DATA

PARAMETER	ARTHUR KILL	KILL VAN KULL	NEWARK BAY	RARITAN BAY	SANDY HOOK BAY	JAMAICA BAY
Oil & Grease						
Low	0.2	0.1	0.1	0.1	0.1	0.1
High	1.0	0.4	1.2	0.4	0.3	0.2
No. of Values	8	2	6	6	4	7
Ortho Phosphate Phosphorus						
Low	0.05	0.05	0.08	0.01	0.01	<0.01
High	0.26	0.12	0.33	0.10	0.11	0.22
No. of Values	20	4	10	11	7	15
Total Phosphate Phosphorus						
Low	0.08	0.12	0.20	0.07	0.05	0.07
High	0.44	0.20	0.43	0.17	0.16	0.38
No. of Values	20	4	10	11	7	16
Ammonia Nitrogen						
Low	0.31	0.39	0.65	0.16	0.05	0.02
High	2.15	0.64	1.55	1.35	1.27	1.59
No. of Values	20	4	10	11	7	16
Nitrite + Nitrate Nitrogen						
Low	0.20	0.25	0.24	0.18	0.15	0.06
High	1.04	0.54	0.57	0.55	0.80	0.38
No. of Values	20	4	10	11	7	16
Total Kjeldahl Nitrogen						
Low	0.90	1.94	1.33	0.68	0.28	0.35
High	3.60	1.94	2.03	2.00	0.88	1.64
No. of Values	13	1	3	3	2	9

NOTES: (1) All units are milligrams per liter.

(2) Data are for October 1978 through September 1979.

BAYONNE 301(h) APPLICATION

APPENDIX 1 (Cont'd)

INTERSTATE SANITATION COMMISSION

1978 - 1979 BOAT SURVEY DATA

PARAMETER	ARTHUR KILL	KILL VAN KULL	NEWARK BAY	RARITAN BAY	SANDY HOOK BAY	JAMAICA BAY
Copper						
Low	0.012	0.011	0.005	0.006	0.003	0.001
High	0.155	0.100	0.060	0.082	0.072	0.222
No. of Values	17	4	12	11	8	16
Zinc						
Low	0.063	0.036	0.032	0.032	0.033	0.017
High	0.173	0.096	0.095	0.186	0.107	0.069
No. of Values	17	4	10	9	6	15
Chromium						
Low	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
High	0.0080	0.0058	0.0150	0.0050	0.0051	0.0070
No. of Values	17	4	12	12	8	16
Lead						
Low	<0.005	0.010	<0.005	<0.005	<0.0050	<0.005
High	0.030	0.010	0.075	0.035	0.0150	0.020
No. of Values	17	4	12	11	8	16
Aluminum						
Low	0.050	0.200	0.060	0.020	0.030	0.020
High	0.250	0.200	0.160	0.290	0.150	0.200
No. of Values	7	1	5	5	4	10
Iron						
Low	0.290	0.450	0.295	0.230	0.130	0.120
High	0.665	0.530	0.485	1.630	0.467	0.660
No. of Values	8	2	6	5	4	10
Nickel						
Low	<0.005	<0.005	0.010	<0.005	<0.005	<0.005
High	0.055	0.015	0.045	0.040	0.040	0.030
No. of Values	17	4	12	11	8	16

NOTES: (1) All units are milligrams per liter.

(2) Data are for October 1978 through September 1979.

(3) All values for heavy metals are for "total metals".

INTERSTATE SANITATION COMMISSION

1978 - 1979 BOAT SURVEY DATA

PARAMETER	ARTHUR KILL	KILL VAN KULL	NEWARK BAY	RARITAN BAY	SANDY HOOK BAY	JAMAICA BAY
Cadmium						
Low	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
High	0.0050	0.0010	0.0055	0.0030	0.0010	0.0060
No. of Values	17	4	12	10	7	16
Mercury						
Low	<0.0001	0.0001	<0.0001	<0.0001	0.0001	<0.0001
High	0.0005	0.0003	0.0005	0.0003	0.0003	0.0004
No. of Values	6	2	4	5	3	7
Silver						
Low	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
High	0.002	0.001	0.001	0.004	0.001	0.001
No. of Values	8	2	6	5	4	10
Cobalt						
Low	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
High	0.005	<0.001	0.006	0.008	0.004	0.002
No. of Values	7	1	6	5	4	9
Tin						
Low	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
High	0.100	<0.050	0.100	0.400	0.100	<0.050
No. of Values	8	2	5	6	4	10
Arsenic						
Low	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
High	0.004	<0.002	0.003	0.001	0.002	0.004
No. of Values	6	1	5	4	3	8
Phenols						
Low	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
High	0.005	0.001	0.005	0.004	0.008	0.006
No. of Values	4	1	3	3	2	5

NOTES: (1) All units are milligrams per liter.

(2) Data are for October 1978 through September 1979.

(3) All values for heavy metals are for "total metals".

BAYONNE 301(h) APPLICATION

APPENDIX 1 (Cont'd)

INTERSTATE SANITATION COMMISSION
1978 - 1979 PESTICIDES AND PCBs DATA
FROM
ISC BOAT RUNS A, B, C & E (1)(2)

WATERWAY	STATION	LATITUDE NORTH D M S	LONGITUDE WEST D M S	PESTICIDES OR PCBs NAME	FOUND VALUE (ppb)
ARTHUR KILL	AK-13	40-33-02	74-15-00	2-BHC	0.005
ARTHUR KILL	AK-18	40-30-24	74-15-34	2-BHC	0.004
EAST RIVER	ER-03	40-44-05	73-58-05	AROCLOR 1242	0.63
EAST RIVER	LI-15	40-47-58	73-47-38	2-BHC	0.002
HUDSON RIVER	HR-01	40-42-20	74-01-36	AROCLOR 1016	0.15
HUDSON RIVER (3)	HR-01	40-42-20	74-01-36	AROCLOR 1260 DIELDRIN	0.250 0.0013
HUDSON RIVER (3)	HR-20	41-19-13	73-59-01	AROCLOR 1260	0.420
JAMAICA BAY	JB-05	40-35-45	73-48-40	2-BHC	0.003
JAMAICA BAY	JB-08	40-36-20	73-48-56	2-BHC	0.002
LONG ISLAND SOUND	LI-24	40-53-57	73-44-27	2-BHC LINDANE	0.006 0.001
LONG ISLAND SOUND (4)	LI-25	40-55-25	73-42-01	2-BHC 2-BHC ALPHA-BHC	0.003 0.004 0.003
LOWER N.Y. BAY	LB-02	40-33-45	74-04-20	2-BHC	0.004
ROCKAWAY INLET	RI-01	40-34-00	73-55-51	2-BHC	0.004
ROCKAWAY INLET	RI-02	40-34-24	73-53-08	2-BHC	0.003

NOTES: (1) Samples were analyzed for pesticides and PCB's at all stations on Boat Runs A, B, C and E. Pesticides or PCB's were found only at the stations included in this table.

(2) Unless otherwise noted, all samples were taken 5 feet below the surface.

(3) Sediment sample taken on special Hudson River Survey. Units are milligrams per kilogram on a dry weight basis.

(4) Samples were taken on different dates.

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

(See Issuing Division below)

PERMIT*

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to the further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit.

Permit No. 0901-90-0003.6	Application No. 0901-90-0003.6	
Issuance Date JANUARY 7, 1999	Effective Date JANUARY 7, 1999	Expiration Date JANUARY 7, 2004

Name and Address of Applicant	Name and Address of Owner	Name and Address of Operator
Bayonne Industries, Inc. 250 East 22nd Street Bayonne, NJ 07002	Same As Applicant	
Location of Activity/Facility *(Street Address)*	**Issuing Division**	**Statute(s)**
Bayonne Industries, Inc. 250 East 22nd Street Bayonne, NJ 07002 Lot: (See Below) Block: (See Below)	Office of Dredging and Sediment Technology	NJSA 58:10A NJSA 12:5-3

Type of Permit	Maximum Approved Capacity, if applicable
Waterfront Development Permit/ Water Quality Certificate	

This permit grants permission to:

This permit authorizes the installation of a pneumatic barrier (Airguard) system at the Pier 3 berthing facility located at the Bayonne Industries, Inc. facility on the Kill Van Kull for the purpose of reducing sedimentation in the berthing area. This permit also authorizes the operation of the system for a period of 18 months during which the NJDEP will require the permittee to conduct a one year monitoring program to evaluate potential effects of the Airguard system on water quality, sedimentation rates, and the aquatic community. Upon completion of the above referenced one year monitoring program, the applicant will be required to submit the results of the study to the NJDEP. At that time, the NJDEP will review the study results and determine if continued authorization to operate the system is appropriate as it has been demonstrated that the system does not have a significant impact on water quality, sedimentation in adjacent areas, and the aquatic community. If the system has an adverse impact on water quality, sedimentation rates and/or the aquatic community, the NJDEP will require that the system be removed.

The system operates by forcing air through perforated pipe which creates an upward stream of air bubbles to keep sediments in suspension. The system consists of the installation of an air compressor on the upland area of Pier #3, underground piping from the compressor to the western end of Pier 3, delivery piping along both bulkheads of the berthing area, and the placement of approximately 825 linear feet of perforated polyethylene piping on the river bottom within the berthing facility. The manifold piping on the river bottom will consist of approximately 50 feet of piping at two locations on each bulkhead. Each section of piping will be located at a 45° angle to the bulkhead, and perpendicular to the other sections of piping. The only section of piping that crosses the entire berthing facility is to be located at the north section of the berthing facility.

The project is located at Lots: 381, 4, TTI, 3,1,3
Blocks: A: 418,419,427,478,481

Prepared By: Suzanne U. Dietrick 1/7/99
Suzanne U. Dietrick Date

(See Page 4 of 4 pages for Chief's signature.)

Revised Date	Approved by the Department of Environmental Protection
	Name (Print or Type) _____ Title _____
	Signature _____ Date _____

CCA000001

**The word permit means "approval, certification, registration, etc."*

(General Conditions are on Page Two)

MEMORANDUM

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO: File

FROM: David C. Longstreet DCL

SUBJECT: Bayonne Industries
Constable Hook, Bayonne

DATE: August 2, 1977

The writer inspected the subject facility on 7/27/77. The following personnel were interviewed:

Mr. Raymond T. Schwedfeger, President
Mr. J. J. Fruchtmann, Vice President

The facility covers approximately 185 acres. The land is rented to several tenants including Bayonne Terminal Warehouse Company, which is a wholly owned subsidiary of Bayonne Industries. Bayonne Terminal Warehouse Co. stores #2, #4, and #6 heating oils.

Mr. Fruchtmann and the writer toured the water front area and some other sections of Bayonne Industries. The water front is currently being upgraded. Buried pipes that are no longer being used are in the process of being removed. The water front includes a bulkhead. On the water side of the bulkhead and about ten feet from it is a second wooden structure that Mr. Fruchtmann referred to as a pollution barrier. The water between the pollution barrier and the bulkhead contains a large quantity of oil and other pollutants. The city of Bayonne sewer line empties at this location. Mr. Fruchtmann stated that at times this line discharges a large quantity of oil. This oil may come from the sewage plant or from intrusion of mixed oil/water from the Bayonne Industries property.

Workmen were observed removing oil saturated soil from behind the bulkhead area. Several skimming devices were set up to remove the oil. These devices are shallow pans which are lowered into the water by hoists and then raised. The liquid is then decanted into containers for disposal. A vacuum collection system is also used to collect heavier concentrations of oil.

Platy Kill creek has a double boom arrangement in order to prevent oil from leaving the area. Workmen were adjusting a boom in order to concentrate the oil for easier collection.

CCA000004

Mr. Fruchtmann and the writer returned to the main office to rejoin Mr. Schwedfeger. Bayonne Industries recognize that they have a ground water problem. They have established the following program:

1. Remove all dead pipe, valves and fittings.
2. Remove oil and oil soaked soil from between the bulkhead and the pollution barrier.
3. Install an oil water seperator. Permit application is in progress.
4. Review consultants proposals for Ground Water investigation.
5. Select a consultant by the fall of this year.
6. Consultant is to start work by October. Investigation will probably take four months.

Conclusions:

This facility has a severe ground water problem. Bayonne Industries activities to resolve this problem should be followed by this office. Additional problems exist, however, they are primarily in the realm of the Raritan Basin responsibilities.

E23:lc

FILE NPDES

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
POST OFFICE BOX 2809
TRENTON, N. J. 08625

AUG 13 1976

Dr. Richard A. Baker, Chief
Status of Compliance Branch
Enforcement and Regional Counsel Division
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, New York 10007

Re: Comments on NPDES Permit No. NJ 0001341
Bayonne Industries, Incorporated

Dear Dr. Baker:

Certification of this activity (Permit) pursuant to the provisions of Section 401 of Public Law 92-500, "Federal Water Pollution Control Act Amendments of 1972", was originally provided by this Department on December 27, 1973. This Department would like to reserve its rights to recertify this permit to reflect current Department policies and regulations. This letter contains comments made subsequent to our review of the draft permit sent to public notice on June 4, 1976.

The permittee operates a bulk oil storage terminal handling various grades of industrial fuel oils. They also lease land and buildings to several tenants who conduct a variety of industrial activities. The permittee and four tenants discharge to an oil skimming pond which is operated by the permittee. It is the discharge from this pond which is the subject of the above-named NPDES permit.

The permit is in the name of Bayonne Industries, Incorporated and contains limitations on the permittee and four of the tenants. One of the tenants, White Chemical Corporation, is contesting the limitations placed on them in this permit. It was stated in a letter to you, dated June 25, 1976, from Mr. Nicholas A. Robinson, attorney representing White Chemical Corporation, that the organics in White Chemical's discharge are absorbed in the oil in the pond and are removed with the oil when it is recovered. They also state that the suspended solids in their wastewater settle out in the skimming pond. It is their contention that their wastewaters are treated by actions in the pond before they ever reach waters of the United States subject to regulation by an NPDES permit. White Chemical Corporation takes the position that the EPA only has the authority to limit the discharge from the oil skimming pond and not before it.

The oil skimming pond was created by building an earthen dam across the Platty Kill Creek. It is our opinion that this "oil skimming pond" is legally a water of the United States (as well as a water of this State). Therefore, any permits issued by your agency should treat this "pond" as the receiving stream. A statutory determination would be in order if this pond is not to be considered as a water of the United States.

[redacted]

CCA000005

We would also point that in response to inquiries from investigators from this office, Mr. Walter Pytlik, plant engineer for Bayonne Industries, answered that the earthen dam in question was constructed by them approximately five years ago. Nevertheless, we would urge that the interim conditions of any permits issued for this permittee require that the "oil skimming pond" be operated so as to minimize the effect of the discharge of oil and other pollutants from this facility by removing as much oil as is possible in this "oil skimming pond".

We are very skeptical about Mr. Robinson's claim that the organics in White Chemical's discharge are absorbed in the oil in the "skimming pond". The permittee should demonstrate how much if any absorption can take place under critical conditions if this claim is to be reflected in the permit. He should also demonstrate that the organics do not result in increased release of any toxic components of the oil. Since the alleged absorption takes place in the waters of the United States, we feel it is inappropriate to grant any "credit" for absorption in the oil even if it can be proven to be significant.

We would also like to point out that the issuance of a single permit for several discharges originating from several companies in different industrial categories is fraught with administrative and legal difficulties. We recommend that separate permits be issued unless it is clear that all parties desire a single permit, that critical responsibilities are divided among the companies in a workable manner, and the application reflects these conditions.

In summary, we recommend that EPA issue separate permits for each of the five companies which regulate their discharges into the impounded (public) waters of the Platty Kill Creek.

Please feel free to call upon Mr. Richard R. Delgado or Mr. William Boehle if we can be of any further assistance in this matter. We may be reached at 609-292-0686.

Very truly yours,

William B. Honachefsky

William B. Honachefsky, Manager
Raritan-Interstate Basin
Pollution Control Monitoring,
Surveillance and Enforcement Element

A27:G18

cc: Jonathan Joseph, EPA
Alan Mytelka, ISC
Bayonne Industries, Incorporated
White Chemical Corporation
Metropolitan Rendering Association, Incorporated
Southern California Chemical Corporation
Rona Pearl, Incorporated

MEMORANDUM

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO: Files

FROM: W. Boehle

SUBJECT: Trip to Bayonne Industries, Inc.
NPDES NJ 0001341

DATE: August 3, 1976

On July 29, 1976 I visited the Bayonne Industries complex and met with Mr. Walter Pytlik, who is Plant Engineer. Bayonne Industries operates an oil storage terminal and leases land and building to tenants who conduct various industrial activities. Wastewaters of the tenants are discharged into the Bayonne Industries sewer system and flow to an oil skimming pond operated by Bayonne Industries. The outfall from the pond is to Platty Kill Creek.

Bayonne Industries located at this facility around 1955. The facility was previously occupied by Tidewater (Getty Oil Co.). Tidewater had created the skimming pond by erecting a sheet pile dam across the creek. However, the present earthen dam was constructed around five (5) years ago, to replace the old dam, by Bayonne Industries.

Two of the tenants do not discharge into the oil skimming pond. Kenrich Petrochemicals has an NPDES permit and discharges to the municipal sewer. Theobald discharges to the Platty Kill Creek downstream of the oil skimming pond. Theobald does not have an NPDES permit as of yet.

The argument raised by one of the tenants, White Chemical Corporation, that only the outfall from the skimming pond should be regulated by the NPDES permit appears to be invalid. They contest that they do not discharge into waters of the United States subject to a NPDES permit and therefore should have no regulations on their discharge into the pond. But the pond was created by blocking off waters of the United States and therefore discharges to the pond should be regulated by the NPDES permit program.

Bayonne Industries indicated that they did not want a permit that would make them responsible for the discharges of their tenants. It would appear that the best solution to the problem, from both the legal and practicable standpoint, would be for EPA to issue separate permits to Bayonne Industries and each of the tenants.

A27:ad

CCA000006

WASHINGTON OFFICE: 815 16TH STREET, N.W.
WASHINGTON, D.C. 20005

CABLE ADDRESS: RETTARB
TELEX: 127544

MARSHALL, BRATTER, GREENE, ALLISON & TUCKER
430 PARK AVENUE, NEW YORK, N.Y. 10022 · (212) 421-7200

June 25, 1976

1976 JUN 29 AM 11 14
RECEIVED
DEPT. OF ENVIR. PROTECT.
DIV. OF WATER RESOURCES

Mr. Richard A. Baker
Chief, Status of Compliance Branch
Enforcement Division
U. S. Environmental Protection
Agency, Region II
26 Federal Plaza
New York, New York 10007

Re: Comments and Request For Extension of
Comment Period For Draft NPDES 76-241
US CCO1341

Dear Mr. Baker:

We are attorneys for White Chemical Corporation, a tenant of Bayonne Industries, Inc. at Bayonne's industrial park at the foot of East 22nd Street, Bayonne, New Jersey.

We have recently received your joint public notice of the application NJ 0001341 for a NPDES Permit for the Bayonne Industries facility. The draft permit and notice of consideration suggest the need for effluent limitations and monitoring of the discharges from the Bayonne Industries facilities related to the operations of White Chemical (discharges labeled 003-A and 003-B in the draft permit).

This week I visited the Bayonne Industries facility and conferred with White Chemical's personnel. It appears that the effluent limitations and monitoring proposed in draft NPDES Permit No. 76-241 should be re-evaluated. The nature of the discharges are such that the limitations as proposed in relation to White Chemical are either unnecessary (as to organics) or are unduly burdensome (as to the suspended solids). The reasons that this is so are as follows:

1. All organics (total organic carbon, chlorinated hydrocarbons, and organic bromide) are absorbed in the oil

CCA000007

in the oil skimming pond which Bayonne Industries maintains and into which White Chemical's effluent is placed. Bayonne removes this oil. White Chemical discharges no organics which ever reach waters of the United States subject to an NPDES Permit. The organics are removed from the skimming pond with the oil when the oil is recovered.

2. White Chemical has no discharges of zinc or chromium from its cooling water labeled 003-A. This water never leaves the cooling pipes during use and is discharged just as received (freshwater from the municipal government and salt water from Bayonne Industries). Accordingly, no limitations are required, and monitoring would be unnecessary.

3. The limitations on total suspended solids are such that White Chemical could not comply with the limitation. In the first place, there is no available space on the area leased by White Chemical for it to build a settling basin to precipitate and filter out the 4-5 pounds of suspended solids (phosphates) which are not already removed during its process. In the second place, the cost of such removal would be inordinant in comparison to the small volume of suspended solids still to be removed. But finally and most importantly, the place to remove suspended solids is in the existing oil skimming pond. There the suspended solids from all Bayonne Industries' tenants are gathered. White Chemical's 4-5 pounds of suspended solids a day are the smallest of the tenants; Bayonne Industries (according to its application for the NPDES Permit) itself discharges 145 pounds a day and the draft permit does not even limit or mention these discharges for discharge 001; the draft permit limits suspended solids for discharge 002 to 79 pounds a day, for 004 to 1-1/2 pounds a day, for 005 to 1-1/4 pounds a day. For White Chemical to reduce from 4-5 pounds a day to the suggested 3/4 pounds a day is unduly burdensome and appears to be a capricious standard in terms of the other suspended solid discharges. Moreover, since the effluent from the skimming pond itself is the actual discharge point into the Platty Kill, the authority of the EPA to limit discharge of suspended solids is effective only at the outfall from the oil skimming pond's pipes and channel, and accordingly as a

matter of law as well as of chemistry and economics, it is only in the skimming pond that the suspended solids, at least of White Chemical, can be regulated.

I have directed that an independent research laboratory conduct tests and supply me with data confirming the chemical reactions described in the paragraph numbered one above. I expect receipt of these tests within four to six weeks.

I believe that it would be desirable for me to confer with you regarding each of the aforesaid three comments. Obviously, such discussion will be most useful after I have the test data just mentioned. I would also prefer to receive your reactions to the comments in paragraphs numbered two and three as soon as practicable so that I can evaluate them prior to our meeting.

Accordingly, pursuant to 40 C.F.R. §125.32(b)(1) [39 Fed. Reg. 27979 (July 24, 1974)], I respectfully request an extension of the comment period on NPDES 76-241 for a period of four weeks, to July 30, 1976. The comment period is now scheduled to end on July 5, 1976. Within that time I should receive the test data I have requested and can prepare to address competently whatever information you can provide for me as to paragraphs numbered two and three above.

If agreeable to you, I shall make myself available in the interim to confer with you. As Jonathan Josephs of your staff is probably aware, White Chemical has almost no discharges of anything but water; its longstanding practice has been to remove by tank any chemical or toxic effluent. It is my understanding that essentially only trace elements or insubstantial amounts of substances are discharged. My review of the NPDES application here reveals that White Chemical's personnel have been very cooperative with Mr. Josephs and have provided information as requested.

I look forward to continuing cooperation with the EPA with respect to the implications which this permit can have on White Chemical. White Chemical reserves its rights to request a hearing on the draft permit and proposed New Jersey certification should such prove necessary at the end of the comment period as extended by the instant application; if for any reason you cannot extend the comment period, we are constrained to request a hearing.

Please advise me by writing of your determination on this application for an extension of the comment period. I look forward to discussing the substance of these comments with your staff. Please arrange for the appropriate EPA representative on your staff to call me directly.

Very truly yours,

Nicholas A. Robinson

cc: Program Manager - Permits (NPDES)
Bureau of Water Pollution Control
Division of Water Resources
Department of Environmental
Protection of The State of New Jersey
P. O. Box 2809
Trenton, New Jersey 08625

bcc: William Richardson
Matthew J. Mallow, Esq.

FORM APPROVED
OMB NO. 49-R 0408

DEPARTMENT OF THE ARMY, CORPS OF ENGINEERS

APPLICATION FOR PERMIT TO DISCHARGE OR WORK IN NAVIGABLE WATERS AND THEIR TRIBUTARIES

SECTION I. GENERAL INFORMATION

1. State	Application Number (to be assigned by Corps of Engineers)
NJ	Div. / Dist. / Type / Sequence No.

2. Name of applicant and title of signing official
Bayonne Industries, Inc.
R. T. Schwedfeger, President

3. Mailing address of applicant
Foot of East 22nd Street
Bayonne, New Jersey 07002

4. Name, address, telephone number and title of applicant's authorized agent for permit application coordination and correspondence.
Bayonne Industries, Inc.
R. T. Schwedfeger, President
Foot of East 22nd Street,
Bayonne, New Jersey 07002
(201) 437 - 2200

NOTE TO APPLICANT: Refer to the pamphlet entitled "Permits for Work and Structures in and for Discharges or Deposits into Navigable Waters" before attempting to complete this form.

Required Information

a. All information contained in this application will, upon request, be made available to the public for inspection and copying. A separate sheet so titled "Confidential Answers" must be used to set out information which is considered by the applicant to constitute trade secrets or commercial or financial information of a confidential nature. The information must clearly indicate the item number to which it applies. Confidential treatment can be considered only for that information for which a specific written request of confidentiality has been made on the attached sheet. However, in no event will identification of the contents and frequency of a discharge be recognized as confidential or privileged information.

b. The applicant shall furnish such supplementary information as is required by the District Engineer in order to evaluate fully an application.

c. If additional space is needed for a complete response to any item on this form, attach a sheet entitled "Additional Information." Indicate on that sheet the item numbers to which answers apply.

d. Drawings required by items 20 and 21 should be attached to this application. Other papers which must be attached to this application include, if applicable, copies of a water quality certification or a written communication which describes water quality impact (see Item 22 and Item 10 of Section II below), the additional information sheet(s) in "c" above, and the confidential information sheet described in "a" above.

Fees

If any discharge or deposit is involved, an application fee of $100 must be submitted with this application. An additional $50 is required for each additional point of discharge or deposit.

Signature

a. If a discharge is involved, an application submitted by a corporation must be signed by the principal executive officer of that corporation or by an official of the rank of corporate vice president or above who reports directly to such principal executive officer and who has been designated by the principal executive officer to make such applications on behalf of the corporation. In the case of a partnership or a sole proprietorship, the application must be signed by a general partner or the proprietor. Other signature requirements are discussed in the pamphlet.

b. If no discharge is involved, an application may be signed by the applicant or his authorized agent.

Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete, and accurate.

R. T. Schwedfeger
Signature of Applicant

18 U.S.C. Section 1001 provides that:

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

FOR CORPS OF ENGINEERS USE ONLY

Acronym name of applicant — Are discharge structures: Major? ☐ Minor? ☐ N/A? ☐

Date received, form not complete — — — — — —
Date received, form complete but without certificate — — — — — —
Date received, form complete — — — — — —
Date of Cert./Ltr. — — — — — —
(day mo yr)

Date sent to EPA, form not complete — — — — — —
Date sent to EPA, NOAA, D/I, AEC — — — — — —
FPC in complete form — — — — — —
(day mo yr)

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CCA000008

SECTION II. PLANT PROCESS AND DISCHARGE DESCRIPTION

1. Discharge described below is: a. Present [X] b. Proposed new or changed [ ]

2. Implementation schedule: Not Applicable

(Office use)

Name of corporate boundaries within which the point of discharge is located.

3. State: New Jersey

4. County: Hudson

5. City or Town: Bayonne

6. Discharge Serial No.: 001

State the precise location of the point of discharge.

7. Latitude: 40° Degrees; 39' Min; 00" Sec.

8. Longitude: 74° Degrees; 06' Min; 20" Sec.

9. Name of waterway at the point of discharge: Platty Kill

10. Has application for water quality certification or description of impact been made? If so, give date:

Date: ___ mo ___ day ___ yr

Check if certificate is attached to form: [ ]

Name Issuing Agency: NOT MADE

11. Narrative description of activity (include terms of general 4-digit Standard Industrial Classification, and specific manufacturing process).

SIC-5092: Company operates a public tank storage terminal handling chiefly (99%) industrial fuel oils and small amount (1%) petrochemicals.

SIC-493: Company also operates an Industrial Park by leasing land and buildings to tenants that operate their own independent businesses. Company generates steam for own use in connection with the terminal activity and sells a portion of steam and cooling water (salt water from Kill Van Kull) to tenants.

12. Standard industrial classification number.

SIC 5092

SIC 493

13. Principal product: Not Applicable

14. Amount of principal product produced per day: Not Applicable

15. Principal raw material: Petroleum

16. Amount of principal raw material consumed per day: We receive and ship cu[illegible] approximately 40,000 bbls. of petroleum products per day.

17. Number of batch discharges per day: Not applicable

18. Average gallons per batch discharge: Not Applicable

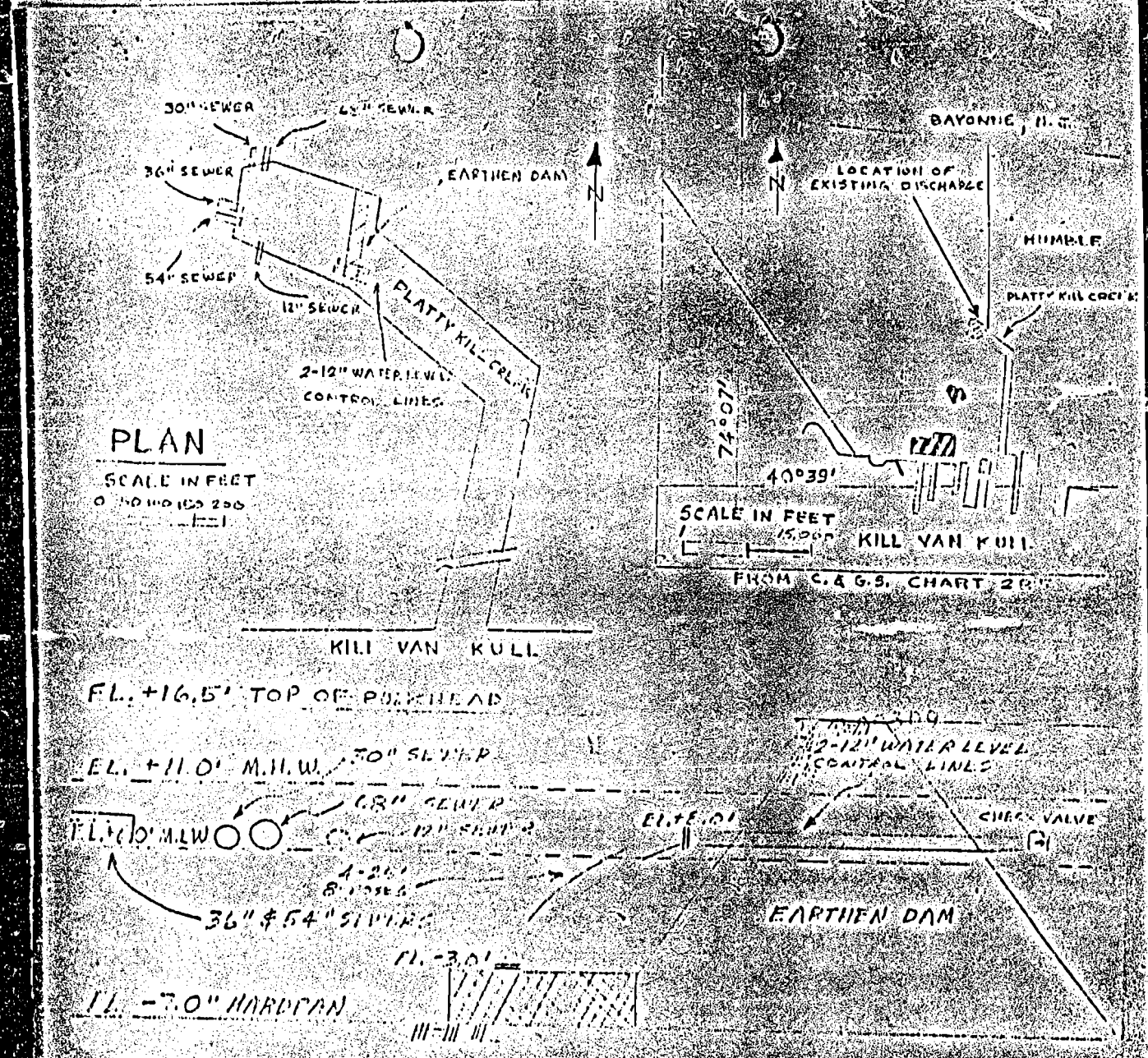
19. Date discharge began: Probably over 50 yrs. ago. mo ___ day ___ yr

20. Date discharge will begin: Not Applicable mo ___ day ___ yr

21. Describe waste abatement practices.

SIC-5092: Small quantities of oil mixed with rain water flow thru our yard storm drainage system into a large separating pond. At the pond the oil floats to the surface and is recovered by means of oil skimming devices and is then pumped into heated storage tanks. In the heated storage tanks the oil is further separated and remaining water is drawn off from bottom of tanks. The water thus drawn off is returned to the separating pond. The dried oil in storage tanks is then used for plant fuel for own furnaces. ESEPAR; ESEGRE; EPUMPS; DHYSIC; RUSEOR

SIC-439: There is no water abatement practice with this activity. Fresh water used in generating steam is obtained from City of Bayonne and the condensate that is not returned to boiler house is discharged into Platty Kill. Salt water used for fire protection is obtained from Kill Van Kull and discharged into Platty Kill. The various companies that purchase from Bayonne Industries steam; fresh & salt water for [illegible] use in their mfg. processes each have their own independent water abatement practices.



EXISTING OUTFALL & DISCHARGE
in PLATTY KILL CREEK
at BAYONNE, NEW JERSEY
County of HUDSON
Application by BAYONNE INDUSTRIES, INC.
date 10-12-72

6. Check type of application: a. Original [ ] b. Revision [X]

7. Number of original application: 2 S D O X W 2 000309

8. Name of facility where discharge or construction will occur.

Bayonne Industries, Inc.

9. Full mailing address of facility named in item 8 above.

Foot of East 22nd Street
Bayonne, New Jersey 07002

10. Names and mailing addresses of all adjoining property owners whose property also adjoins the waterway.

Humble Oil Company, Foot of East 22nd Street
City of Bayonne 07002

11. Check to indicate the nature of the proposed activity:
a. Dredging [ ] b. Construction [ ] c. Construction with Discharge [ ] b. Discharge only [X]

12. If activity is temporary in nature, estimate its duration in months.

Not applicable

If application is for a discharge:

13. List intake sources

Source	Estimated Volume in Million Gallons Per day or Fraction Thereof
Municipal or private water supply system	.5
Surface water body	
Ground water (unable to estimate rain)	
Other - Salt Water	.4

14. Describe water usage within the plant

Type	Estimated Volume in Million Gallons Per day or Fraction Thereof
Cooling water (Sold to tenants)	.36
Boiler Feed water	.399
Process water (Sold to tenants)	.10
Sanitary system*	.001
Other (Yard fire protection)	.04

15. List volume of discharges or losses other than into navigable waters.

Type	Estimated Volume in Million Gallons Per day or Fraction Thereof
Municipal waste treatment system	.05
Surface containment	
Underground disposal	.001
Waste Acceptance firms	
Evaporation (and steam losses)	.08
Consumption	.09

* Indicate number employees served per day 100

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22. PHYSICAL DESCRIPTION OF INTAKE WATER AND DISCHARGE

Intake	Discharge	(Office use only)
SEE NOTE BELOW		

Discharge Serial No.: 001

Parameter and (Code)	UNTREATED INTAKE WATER (1)	TREATED INTAKE WATER (2)	AVERAGE (DAILY) (3)	MINIMUM (OPERATING YEAR) (4)	MAXIMUM (OPERATING YEAR) (5)	SAMPLE FREQUENCY (6)	CONTINUOUS MONITORING (7)
Flow (Gallons per day) 00056	400,000	500,000	650,000	600,000	750,000	(1) grab sample	A B S
pH 00400	6.5	6.0	6.0	6.0	6.5	(1) grab sample	A B S
Temperature (Winter) (°F) 74028	35°F	45°F	40°F	34°F	45°F	(1) grab sample	A B S
Temperature (Summer) (°F) 74027	65°F	65°F	65°F	60°F	70°F	(1) grab sample	A B S

23. DISCHARGE CONTENTS

PARAMETER	PRESENT	ABSENT	PARAMETER	PRESENT	ABSENT	PARAMETER	PRESENT	ABSENT
Color 00080		X	Aluminum 01105		X	Nickel 01067		X
Turbidity 00070	X		Antimony 01097		X	Selenium 01147		X
Radioactivity 74050		X	Arsenic 01002		X	Silver 01077		X
Hardness 00900		X	Beryllium 01012		X	Potassium 00937		X
Solids 00500	X		Barium 01007		X	Sodium 00929		X
Ammonia 00610	X		Boron 01022		X	Titanium 01152		X
Organic Nitrogen 00605		X	Cadmium 01027		X	Tin 01102		X
Nitrate 00620	X		Calcium 00916		X	Zinc 01092	X	
Nitrite 00615		X	Cobalt 01037		X	Algicides 74051		X
Phosphorus 00665		X	Chromium 01034		X	Oil and Grease 00550	X	
Sulfate 00945	X		Copper 01042		X	Phenols 32730	X	
Sulfide 00745		X	Iron 01045		X	Surfactants 38260		X
Sulfite 00740		X	Lead 01051		X	Chlorinated Hydrocarbons 74052		X
Bromide 71870		X	Magnesium 00927		X	Pesticides 74053		X
Chloride 00940	X		Manganese 01056		X	Fecal Streptococci Bacteria 74054		X
Cyanide 00720		X	Mercury 71900		X	Coliform Bacteria 74056	X	
Fluoride 00951		X	Molybdenum 01062		X			

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NOTE: Column (1) is salt water from Kill Van Kull.
Column (2) is fresh water from City of Bayonne.

24a. Have all known hazardous or potentially hazardous substances in your plant been inventoried?

[X] Yes [ ] No

24b. If yes, have steps been taken to insure that there exists no possibility of any such known hazardous or potentially hazardous substance entering this discharge?

[X] Yes [ ] No

25. Remarks.

The information above completes the basic reporting requirements which are required of all applicants. Those applicants whose discharge results from an activity included within any of the Standard Industrial Classification Code (SIC Code) categories listed below must complete Part A of this form as well.

CRITICAL INDUSTRIAL GROUPS

SIC	098	FISH HATCHERIES, FARMS, AND PRESERVES	SIC	285	PAINTS, VARNISHES, LACQUERS, ENAMELS, AND ALLIED PRODUCTS
SIC	10-14	DIVISION B – MINING	SIC	2871	FERTILIZERS
SIC	201	MEAT PRODUCTS	SIC	2879	AGRICULTURAL PESTICIDES, AND OTHER AGRICULTURAL CHEMICALS, NOT ELSEWHERE CLASSIFIED
SIC	202	DAIRY PRODUCTS	SIC	2891	ADHESIVES AND GELATIN
SIC	203	CANNED PRESERVED FRUITS, VEGETABLES (EXCEPT SEAFOODS, SIC 2031 AND 2036)	SIC	2892	EXPLOSIVES
SIC	2031, 2036	CANNED AND CURED FISH AND SEAFOODS; FRESH OR FROZEN PACKAGED FISH AND SEAFOODS	SIC	29	PETROLEUM REFINING AND RELATED INDUSTRIES
SIC	204	GRAIN MILL PRODUCTS	SIC	3011, 3069	TIRES AND INNER TUBES; FABRICATED RUBBER PRODUCTS, NOT ELSEWHERE CLASSIFIED
SIC	206	SUGAR	SIC	3079	MISCELLANEOUS PLASTICS PRODUCTS
SIC	207	CONFECTIONARY AND RELATED PRODUCTS	SIC	311	LEATHER TANNING AND FINISHING
SIC	208	BEVERAGES	SIC	32	STONE, CLAY, GLASS, AND CONCRETE PRODUCTS
SIC	209	MISCELLANEOUS FOOD PREPARATIONS AND KINDRED PRODUCTS	SIC	331	BLAST FURNACES, STEEL WORKS, AND ROLLING AND FINISHING MILLS
SIC	22	TEXTILE MILL PRODUCTS	SIC	332	IRON AND STEEL FOUNDRIES
SIC	23	APPAREL AND OTHER FINISHED PRODUCTS MADE FROM FABRICS AND SIMILAR MATERIALS	SIC	333, 334	PRIMARY SMELTING AND REFINING OF NONFERROUS METALS; SECONDARY SMELTING AND REFINING OF NONFERROUS METALS
SIC	242	SAWMILLS AND PLANING MILLS	SIC	336	NONFERROUS FOUNDRIES
SIC	2432	VENEER AND PLYWOOD	SIC	347	COATING, ENGRAVING, AND ALLIED SERVICES
SIC	2491	WOOD PRESERVING	SIC	35	MACHINERY, EXCEPT ELECTRICAL
SIC	26	PAPER AND ALLIED PRODUCTS	SIC	36	ELECTRICAL MACHINERY, EQUIPMENT, AND SUPPLIES
SIC	281	INDUSTRIAL INORGANIC AND ORGANIC CHEMICALS (EXCEPT SIC 2818)	SIC	37	TRANSPORTATION EQUIPMENT (EXCEPT SHIP BUILDING AND REPAIRING, SIC 3731)
SIC	2818	INDUSTRIAL ORGANIC CHEMICALS	SIC	3731	SHIP BUILDING AND REPAIRING
SIC	282	PLASTICS MATERIALS AND SYNTHETIC RESINS, SYNTHETIC RUBBER, SYNTHETIC AND OTHER MAN-MADE FIBERS, EXCEPT GLASS	SIC	491	ELECTRIC COMPANIES AND SYSTEMS
SIC	283	DRUGS	SIC	493	COMBINATION COMPANIES AND SYSTEMS
SIC	284	SOAP, DETERGENTS, AND CLEANING PREPARATIONS, PERFUMES, COSMETICS, AND OTHER TOILET PREPARATIONS			

PART A

(Note: Submission of Part A is required of all applicants whose processes are listed on page 3 above.)

(Office use only)

Discharge Serial No. 001

INFORMATION REQUIRED OF SPECIFIED INDUSTRIES

PARAMETER AND CODE	Intake: DAILY AVG. CONCENTRATION UNTREATED INTAKE WATER (1)	Intake: DAILY AVG. CONCENTRATION TREATED INTAKE WATER (2)	Discharge: MAXIMUM CONCENTRATION PER PROCESS UNIT (3)	Discharge: MAXIMUM POUNDS PER DAY (4)	Discharge: DAILY AVG. CONCENTRATION (5)	Discharge: AVERAGE POUNDS PER DAY (6)	SAMPLE TYPE (7)	SAMPLE FREQUENCY (8)	METHOD OF ANALYSIS (9)	CONTINUOUS MONITORING (10)	(11)
ALKALINITY (as $CaCO_3$) 00410	86	18	80	455	455	80	455	Aver	Othr	Stnd	ABS
B.O.D. 5-DAY 00310	0.7	<0.5	3.7	21.5	21.5	3.7	21.5	Aver	Othr	Stnd	ABS
CHEMICAL OXYGEN DEMAND (C.O.D.) 00340	265	39.2	372	2110	2110	372	2110	Aver	Othr	Stnd	ABS
TOTAL SOLIDS 00500	21,04[illegible]	70	20,943	119,500	119,500	20,943	119,500	Aver	Othr	Stnd	ABS
TOTAL DISSOLVED SOLIDS 70300	21,000	68	20,968	119,000	119,000	20,968	119,000	Aver	Othr	Stnd	ABS
TOTAL SUSPENDED SOLIDS 00530	29	2	25	142	142	25	142	Aver	Othr	Stnd	ABS
TOTAL VOLATILE SOLIDS 00505	2,102	19	2,282	12,980	12,980	2,282	12,980	Aver	Othr	Stnd	ABS
AMMONIA (as N) 00610	0.54	0.35	0.54	3.06	3.06	0.54	3.06	Aver	Othr	Stnd	ABS
KJELDAHL NITROGEN 00625	70.7	7.0	0.7	3.97	3.97	0.7	3.97	Aver	Othr	Stnd	ABS
NITRATE (as N) 00620	0.06	0.02	0.06	.34	.34	0.06	.34	Aver	Othr	Stnd	ABS
PHOSPHORUS TOTAL (as P) 00665	>0.05	>0.05	>0.05	>.28	>.28	>0.05	>.28	Aver	Othr	Stnd	ABS

NOTE: Column (1) is salt water from Kill Van Kull.
Column (2) is fresh water from City of Bayonne.
Column (3) is one (1) grab sample.

PART B - DISCHARGE DESCRIPTION

(Note: Submission of Part B is required of all applicants who are also required to submit Part A. Only those parameters specifically indicated in the instructions are to be reported by a particular industry)

(Office use only)

Discharge Serial No.: 001

B-1. PHYSICAL AND BIOLOGICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-1)

Intake: SEE NOTE

Discharge: 001

PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) AVERAGE (DAILY)	(4) MINIMUM (OPERATING YEAR)	(5) MAXIMUM (OPERATING YEAR)	(6) SAMPLE FREQUENCY	(7) CONTINUOUS MONITORING
COLOR 00080				X			
SPECIFIC CONDUCTANCE 00095				X			
TURBIDITY 00070	> 18	> 18	> 18	X	> 18	0	A
FECAL STREPTOCOCCI BACTERIA 74054				X			
FECAL COLIFORM BACTERIA 74055				X			
TOTAL COLIFORM BACTERIA 74056	35	> 1	240	X	240	0	A
				X			
				X			
				X			

NOTE: Column (1) is salt water from Kill Van Kull.
Column (2) is fresh water from City.
Column (6) is one (1) grab sample.

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PART B

(Office use only)

Discharge Serial No.: C01

B-2. CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

Intake		Discharge									
PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) MAXIMUM CONCENTRATION	(4) MAXIMUM POUNDS PER DAY (SEE PROCESS UNIT)	(5) DAILY AVG. CONCENTRATION	(6) AVERAGE POUNDS PER DAY	(7) SAMPLE TYPE	(8) SAMPLE FREQUENCY	(9) METHOD OF ANALYSIS	(10) CONTINUOUS MONITORING	(11)
ACIDITY (as $CaCO_3$) 00435											
TOTAL ORGANIC CARBON (T.O.C.) 00680											
TOTAL HARDNESS 00900											
NITRITE (as N) 00615											
ORGANIC NITROGEN 00605											
PHOSPHORUS-ORTHO (as P) 70507											
SULFATE 00945	POC	5	1,000	5,674	5,674	1,000	5,674	A	O	S	A
SULFIDE 00745											
SULFITE 00740											
BROMIDE 71870											

Column (1) is salt water; Column (2) is fresh water.
Column (9) is (1) grab sample.

PART B

(Office use only)

Discharge Serial No. 001

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

	Intake	Discharge									
PARAMETER AND CODE	UNTREATED INTAKE WATER (1)	TREATED INTAKE WATER (2)	MAXIMUM CONCENTRATION (3)	MAXIMUM POUNDS PER DAY PER PROCESS UNIT (4)	MAXIMUM POUNDS PER DAY (5)	DAILY AVG. CONCENTRATION (6)	AVERAGE POUNDS PER DAY (7)	SAMPLE TYPE (8)	SAMPLE FREQUENCY (9)	METHOD OF ANALYSIS (10)	CONTINUOUS MONITORING (11)
CHLORIDE 00940	10,700	56	10,300	58,500	58,500	10,30	58,500	A	0	S	A
CYANIDE 00720											
FLUORIDE 00951											
ALUMINUM-TOTAL 01105											
ANTIMONY-TOTAL 01097											
ARSENIC-TOTAL 01002											
BARIUM-TOTAL 01007											
BERYLLIUM-TOTAL 01012											
BORON-TOTAL 01022											
CADMIUM-TOTAL 01027											

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Column (1) is salt water; Column (2) is fresh water
Column (9) is (1) grab sample

PART B

(Office use only)

Discharge Serial No. 001

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

	Intake	Discharge									
PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) MAXIMUM CONCENTRATION	(4) MAXIMUM POUNDS PER DAY PER PROCESS UNIT	(5) MAXIMUM POUNDS PER DAY	(6) DAILY AVG. CONCENTRATION	(7) AVERAGE POUNDS PER DAY	(8) SAMPLE TYPE	(9) SAMPLE FREQUENCY	(10) METHOD OF ANALYSIS	(11) CONTINUOUS MONITORING
CALCIUM-TOTAL 00916											
CHROMIUM-TOTAL 01034	>0.1	>0.1	>0.1	>.5	>.5	>0.1	>.5	A	O	S	A
COBALT-TOTAL 01037											
COPPER-TOTAL 01042	>0.02	>0.02	>0.02	>.1	>.1	>0.02	>.1	A	O	S	A
IRON-TOTAL 01045											
LEAD-TOTAL 01051											
MAGNESIUM-TOTAL 00927											
MANGANESE-TOTAL 01055											
MERCURY-TOTAL 71900											
MOLYBDENUM-TOTAL 01062											

PART B

(Office use only)

Discharge Serial No.

001

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

	Intake		Discharge									
PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) MAXIMUM CONCENTRATION PER PROCESS UNIT	(4) MAXIMUM POUNDS PER DAY	(5) DAILY AVG. CONCENTRATION	(6) AVERAGE POUNDS PER DAY	(7) SAMPLE TYPE	(8) SAMPLE FREQUENCY	(9) METHOD OF ANALYSIS	(10) CONTINUOUS MONITORING	(11)
NICKEL-TOTAL 01067											
POTASSIUM-TOTAL 00937											
SELENIUM-TOTAL 01147											
SILVER-TOTAL 01077											
SODIUM-TOTAL 00929											
THALLIUM-TOTAL 01059											
TIN-TOTAL 01102											
TITANIUM-TOTAL 01152											
ZINC-TOTAL 01092	0.02	0.01	0.02	>.1	>.1	>.02	>.1	A	O	S	A
OIL AND GREASE 00550	10.6	15.2	15.2	88.5	88.5	15.6	88.5	A	O	S	A

ENG FORM 4345-1 JUN 71

PART B

(Office use only)

Discharge Serial No. 001

B-2. (cont.) CHEMICAL PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-2)

	Intake	Discharge									
PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) MAXIMUM CONCENTRATION	(4) MAXIMUM POUNDS PER DAY PER PROCESS UNIT	(5) DAILY AVG. CONCENTRATION	(6) AVERAGE POUNDS PER DAY	(7) SAMPLE TYPE	(8) SAMPLE FREQUENCY	(9) METHOD OF ANALYSIS	(10) CONTINUOUS MONITORING	(11)
PHENOLS 32730	>0.03	>0.03	>0.03	>.15	>.15	>0.03	>.15	A	O	S	A
SURFACTANTS 38260											
ALGICIDES* 74051											
CHLORINATED HYDROCARBONS* (EXCEPT PESTICIDES) 74052											
PESTICIDES* 74053											
AMMONIA 00610	0.54	0.35	0.54	3.06	3.06	0.54	3.06	A	O	S	A
NITRATE 00620	0.06	0.02	0.06	0.34	0.34	0.06	0.34	A	O	S	A

*Name specific compound(s) and fill in the required data for each. Use extra blanks at the end of the form and the "Remarks" space as necessary.

ENG FORM 4345-1 JUN 71

PART B

(Office use only) 7 1 D C W 2 0 0 0 0 9

Discharge Serial No.

B-3. RADIOACTIVE PARAMETERS OF INTAKE WATER AND DISCHARGE (See Table B-3)

Intake	Discharge						
PARAMETER AND CODE	(1) UNTREATED INTAKE WATER	(2) TREATED INTAKE WATER	(3) AVERAGE (DAILY)	(4) MINIMUM (OPERATING YEAR)	(5) MAXIMUM (OPERATING YEAR)	(6) SAMPLE FREQUENCY	(7) CONTINUOUS MONITORING
ALPHA-TOTAL 01501				X			
ALPHA COUNTING ERROR 01502				X			
BETA-TOTAL 03501				X			
BETA COUNTING ERROR 03502				X			
GAMMA-TOTAL 05501				X			
GAMMA COUNTING ERROR 05502				X			
TRITIUM-TOTAL 07000				X			
TRITIUM COUNTING ERROR 07001				X			

B-4. REMARKS

OCT 17 1972

BAYONNE INDUSTRIES, INC.

FOOT OF EAST 22ND STREET BAYONNE, NEW JERSEY 07002

RAYMOND T. SCHWEDFEGER
PRESIDENT

PHONE 437-2200

October 16, 1972

Mr. Jeff Zelikson
Environmental Engineer
Enforcement Division
Environmental Protection Agency
26 Federal Plaza
New York, New York 10007

Dear Mr. Zelikson:

This will serve to confirm our recent conversation regarding your letter of October 12, 1972. It was pointed out to you that the sampling as reported in our Permit Application No. 2SD OXW 2 000309 was taken at the two 12" discharge pipes that run through the earthen dam across the Platty Kill. Since these two 12" pipes are located immediately adjacent to one another and they have the same suction and discharge points we have agreed that for all practical purposes they can be considered as one pipe.

With regard to the list of parameters requiring analysis, it was pointed out to you that in our original application Chromium, Phosphorus, Nitrate, Zinc, Oil and Grease and Phenols were reported. The Total Organic Carbon and Bismuth analysis that you now requested were not required on our original application. However, in an effort to try to cooperate with you in determining if there is an effluent problem with our tenants we have agreed to run an analysis for each of these two parameters and as soon as this information is available, I will forward it on to you.

Very truly yours,

BAYONNE INDUSTRIES, INC.

R. T. Schwedfeger

R. T. Schwedfeger
President

RTS:pmg

CCA000008A

BAYONNE INDUSTRIES, INC.

FOOT OF EAST 22ND STREET BAYONNE, NEW JERSEY 07002

RAYMOND T. SCHWEDFEGER
PRESIDENT

PHONE 437-2200

April 12, 1973

RECEIVED
APR 13 11 23 AM '73
DEPT. ENVIR. PROTECT.
DIV. OF WATER RESOURCES

Mr. Karl F. Birns
Principal Environmental Engineer
State of New Jersey Department
of Environmental Protection
P. O. Box 1390
Trenton, New Jersey 08625

Dear Mr. Birns:

Please refer to your letter of April 2, 1973 requesting certain information from us. The following are our answers to these questions:

1. We handle No. 2, No. 4, and No. 6 fuel oil. Our total annual thruput volume is approximately 18,000,000 barrels per year.

2. Our total annual handling loses are less than one-quarter of one percent.

3. Our sanitary waste is disposed of by means of septic systems; storm water - by storm sewer that empties into the Kill Van Kull; processing waters - not applicable; cooling water - by storm sewer that empties into the Kill Van Kull.

4. No

5. Yes

6. Yes

7. We have had some spills in our yard area from pipeline leakage. The product lost is picked up immediately.

8. No

9. Fresh water from the City of Bayonne approximate daily volume equals 500,000 gallons.
Cooling water taken from the Kill Van Kull approximate daily volume - 400,000 gallons.

CCA000009

Mr. Karl F. Birns
April 12, 1973

Enclosed herewith for your information is a copy of our plot plan drawing showing the location of the tanks, buildings, piers, etc. I am sorry but we do not have any up-to-date drawings that show the surface drainage ditches, storm sewers and pump stations. We do not have any treatment equipment, well points or data on test borings.

With regard to the meeting now scheduled for April 27 at 10:00 AM, I wish to advise that I will be in attendance.

Very truly yours,

BAYONNE INDUSTRIES, INC.

R. T. Schwedfeger

R. T. Schwedfeger
President

RTS:pmg

cc: Mr. Kenneth Piontek

DWR: 052

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

REPORT OF PHONE CALL OR VISIT

Bureau or Office

In ✓ Out

File BAYONNE INDUSTRIES

Date 6/10/84 Time

Routing TBH

Person Contacted MR. E. COONEY, TERMINAL MGR. Phone No.

Affiliation BAYONNE INDUSTRIES, 22ND ST., BAYONNE

Subject of (Call / Visit)

Summary of (Call / Visit) WENDELL BORN, ASST. TERMINAL MANAGER
MIKE SMITH; LICENSED OPERATOR
OLD OIL/WATER SEPERATOR (TIDEWATER OIL DAYS, 30-40 YEARS AGO), IN BAD SHAPE. (NEEDS CLEANING BAD!) BAYONNE INDUSTRIES WORKING ON TRYING TO CLEAN OUT THE SEPERATOR AREA.
BAYINNE INDUSTRIES OUTFALL VISABLE AND ABOVE WATER LINE.
RONA PEARL OUTFALL 1/2 UNDER WATER AND VISABLE.
NUMEROUS OIL SPILLS THROUGHOUT SITE, PILE OF OIL CONTAMINATED SOIL STILL ON SITE FROM SPILL WHICH OCCURED 2 YEARS AGO.

Action Recommended CHECK ON DISPOSAL OF OIL CONTAMINATED SOIL

[redacted] Signature

CCA000011

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
TRENTON, NEW JERSEY 08625

John W. Gaston, Jr.
Director

December 10, 1982

Mr. R. T. Schwedfeger, President
Bayonne Industries, Inc.
Foot of East 22nd Street
P.O. Box 281
Bayonne, NJ 07002

Re: NJPDES Permit No. 0001341

Dear Mr. Schwedfeger:

On September 28, 1982, a representative of the Division of Water Resources (DWR) conducted an NJPDES Compliance Evaluation Inspection at the Bayonne Industries facility in Bayonne. A copy of the inspection report is enclosed.

This inspection and the analysis of wastewater collected from discharge 001 found Bayonne Industries in compliance with NJPDES Permit No. NJ 0001341. However, wastewater samples have continued to find excessive amounts of chemical oxygen demand 186 mg/l in the discharge from this facility. This condition was previously brought to your attention in correspondence from this office.

If you have any questions regarding the above, please contact Mr. Richard White of this office at (201) 648-2200.

Very truly yours,

Thomas B. Harrington
Field Operations Supervisor
Region I
Enforcement Element

A53:G25

CCA000012

BAYONNE INDUSTRIES INC
FOOT OF EAST 22ND STREET
BAYONNE
NJ 07002

(12-13) ST	(4-10) PERMIT NUMBER		(17-19) DIS	SIC	LATITUDE	LO
NJ	0001341	F	001	2819	74° 06' 25"	100 3

REPORTING PERIOD: FROM (20-21) YEAR 78 (22-23) MO 05 (24-25) DAY 01 TO (26-27) YEAR 78 (28-29) MO 07 (30-31) DAY 31

(32-37) PARAMETER		(3 card only) (38-45) MINIMUM	(46-53) AVERAGE	(54-6) MAXIMUM
00400 1 PH	REPORTED	6.69	N/A	7.52
EFFLUENT GROSS	PERMIT CONDITION	6.00	* * * * *	9.00
00550 1 OIL AND GREASE	REPORTED	N/A	N/A	N/A
EFFLUENT GROSS	PERMIT CONDITION	* * * * *	* * * * *	* * * * *
50050 1 FLOW	REPORTED	0	.664	3.76
EFFLUENT GROSS	PERMIT CONDITION	* * * * *	* * * * *	* * * * *
	REPORTED			
	PERMIT CONDITION			
	REPORTED			
	PERMIT CONDITION			
	REPORTED			
	PERMIT CONDITION			
	REPORTED			
	PERMIT CONDITION			
	REPORTED			
	PERMIT CONDITION			

NAME OF PRINCIPAL EXECUTIVE OFFICER			TITLE OF THE OFFICER	D
Fruchtmann	Jerome	J.	Vice President-Operations	8 2
LAST	FIRST	MI	TITLE	EAR

EPA Form 3320-1 (10-72) FLOW MEASUREMENTS SHALL ACHIEVE AN ACCURACY WITH
E GRAB.

PLATTY KILL
BAYONNE CITY

00608
GP AT MI
3 5 J

INSTRUCTIONS

1. Provide dates for period covered by this report in spaces marked "REPORTING PERIOD".
2. Enter reported minimum, average and maximum values under "QUANTITY" and "CONCENTRATION" in the units specified for each parameter as appropriate. Do not enter values in boxes containing asterisks. "AVERAGE" is average computed over actual time discharge is operating. "MAXIMUM" and "MINIMUM" are extreme values observed during the reporting period.
3. Specify the number of analyzed samples that exceed the maximum *(and/or minimum as appropriate)* permit conditions in the columns labeled "No. Ex." If none, enter "0".
4. Specify frequency of analysis for each parameter as No. analyses/No. days. *(e.g., "3/7" is equivalent to 3 analyses performed every 7 days.)* If continuous enter "CONT."
5. Specify sample type *("grab" or "__ hr. composite")* as applicable. If frequency was continuous, enter "NA".
6. Appropriate signature is required on bottom of this form.
7. Remove carbon and retain copy for your records.
8. Fold along dotted lines, staple and mail Original to office specified in permit.

"15"
GITUDE

QUANTITY (4 card only)				CONCENTRATION					FREQUENCY OF ANALYSIS	SAMPLE TYPE
UNITS	NO. EX	MINIMUM	AVERAGE	MAXIMUM	UNITS	NO. EX				
SU	0	* * * *	* * * *	* * * *	SU	N/A	1/30	GR
		* * * *	* * * *	* * * *			1/30	GR
KG/DAY	N/A	2.1	8.79	18.9	MG/L	2	2/30	GR
		* * * *	10.00	15.00			2/30	*
MGD	N/A	* * * *	* * * *	* * * *	MGD	N/A	CONT	N/A
		* * * *	* * * *	* * * *			CONT	*

ATE
8 7 8
MO DAY

I certify that I am familiar with the information contained in this report and that to the best of my knowledge and belief such information is true, complete and accurate.

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

IN THE RANGE OF 15 OIL & GREASE SAMPLE TYPE IS MULTIPL

ORIGINAL

PAGE OF

CB 9/11/78

Form Approved
OMB No. 158-R0073

NPDES COMPLIANCE INSPECTION REPORT (Coding Instructions on back of last page)

TRANSACTION CODE	NPDES	YR MO DA	TYPE	INSPECTOR	FAC TYPE	TIME
N 5	NJ0001341	78 07 10	S		2	0900 a.m. p.m.

REMARKS

ADDITIONAL

SECTION A - Permit Summary

NAME AND ADDRESS OF FACILITY (Include County, State and ZIP code)		EXPIRATION DATE / ISSUANCE DATE
Bayonne Industries, Inc. Foot of East 22nd Street Bayonne, Hudson County, New Jersey 07002		81/10/31 76/10/31
RESPONSIBLE OFFICIAL: Raymond T. Schwedfeger	TITLE: President	PHONE: (201) 437-2200
FACILITY REPRESENTATIVE: Walter S. Pytlik	TITLE: Plant Engineer	PHONE: (201) 437-2200

RECEIVED SEP 19 9 06 AM '78 SECRETARY PROTECTION DIV WATER RESOURCES N S & E

SECTION B - Effluent Characteristics (Additional sheets attached 1)

PARAMETER/ OUTFALL		MINIMUM	AVERAGE	MAXIMUM	ADDITIONAL
Flow/ 001 (MGD)	SAMPLE MEASUREMENT		0.32		
	PERMIT REQUIREMENT	N/A	N/A	N/A	
Oil and Grease/ 001 (mg/l)	SAMPLE MEASUREMENT	62.0	95.0	128.0	Out of compliance
	PERMIT REQUIREMENT		10	15	3/1 multiple grab sampling freq
pH/ 001	SAMPLE MEASUREMENT	7.2	7.3	7.4	3/1 sampling frequency
	PERMIT REQUIREMENT	6.0		9.0	
Turbidity/ 001 (JTU)	SAMPLE MEASUREMENT		20		Unit of measure NTU
	PERMIT REQUIREMENT		50	150	
Petroleum Hydrocarbons/ 001 (mg/l)	SAMPLE MEASUREMENT	4.3	11.0	20.5	Out of compliance
	PERMIT REQUIREMENT		none detectable		

SECTION C - Facility Evaluation (S = Satisfactory, U = Unsatisfactory, N/A = Not applicable)

U EFFLUENT WITHIN PERMIT REQUIREMENTS	S OPERATION AND MAINTENANCE	U SAMPLING PROCEDURES
S RECORDS AND REPORTS	S COMPLIANCE SCHEDULE	S LABORATORY PRACTICES
S PERMIT VERIFICATION	U FLOW MEASUREMENTS	OTHER:

SECTION D - Comments

SECTION E - Inspection/Review

SIGNATURES	AGENCY	DATE
INSPECTED BY Kenneth J Cummins	Versar	8/11/78
INSPECTED BY		
REVIEWED BY Edwin F. Obrams	Versar	8/11/78

ENFORCEMENT DIVISION USE ONLY
COMPLIANCE STATUS
☐ COMPLIANCE
☐ NONCOMPLIANCE

EPA FORM 3560-3 (9-77) REPLACES EPA FORM T-51 (9-76) WHICH IS OBSOLETE.

CCA000014

Form Approved
OMB No. 158-R0073

NPDES COMPLIANCE INSPECTION REPORT (Coding Instructions on back of last page)

TRANSACTION CODE	NPDES	YR	MO	DA	INSPECTION TYPE	INSPECTOR	FACILITY TYPE	TIME
N	NJ0001341	78	07	10	S		2	0900 a.m. / p.m.

REMARKS

ADDITIONAL

SECTION A - Permit Summary

NAME AND ADDRESS OF FACILITY (Include County, State and ZIP code)
Bayonne Industries, Inc.
Foot of East 22nd Street
Bayonne, Hudson County, New Jersey 07002

EXPIRATION DATE: 81/10/31
ISSUANCE DATE: 76/10/31

RESPONSIBLE OFFICIAL	TITLE	PHONE
Raymond T. Schwedfeger	President	(201) 437-2200
FACILITY REPRESENTATIVE	**TITLE**	**PHONE**
Walter S. Pytlik	Plant Engineer	(201) 437-2200

SECTION B - Effluent Characteristics (Additional sheets attached)

PARAMETER/ OUTFALL		MINIMUM	AVERAGE	MAXIMUM	ADDITIONAL
BOD5/ 001 (% removal)	SAMPLE MEASUREMENT		10.6		Out of compliance
	PERMIT REQUIREMENT		80		
	SAMPLE MEASUREMENT				
	PERMIT REQUIREMENT				
	SAMPLE MEASUREMENT				
	PERMIT REQUIREMENT				
	SAMPLE MEASUREMENT				
	PERMIT REQUIREMENT				
	SAMPLE MEASUREMENT				
	PERMIT REQUIREMENT				

SECTION C - Facility Evaluation (S = Satisfactory, U = Unsatisfactory, N/A = Not applicable)

U	EFFLUENT WITHIN PERMIT REQUIREMENTS	S	OPERATION AND MAINTENANCE	U	SAMPLING PROCEDURES
S	RECORDS AND REPORTS	S	COMPLIANCE SCHEDULE	S	LABORATORY PRACTICES
S	PERMIT VERIFICATION	U	FLOW MEASUREMENTS		OTHER:

SECTION D - Comments

SECTION E - Inspection/Review

SIGNATURES	AGENCY	DATE
INSPECTED BY Kenneth J. Quinn	Versar	8/11/78
INSPECTED BY		
REVIEWED BY Edward T. Abrons	Versar	8/11/78

ENFORCEMENT DIVISION USE ONLY
COMPLIANCE STATUS
☐ COMPLIANCE
☐ NONCOMPLIANCE

Form Approved
OMB No. 158-R0073

Sections F thru L: Complete on all sections, as appropriate. N/A = Not Applicable

PERMIT NO. NJ 0001341

SECTION F - Facility and Permit Background

ADDRESS OF PERMITTEE IF DIFFERENT FROM FACILITY *(Including City, County and ZIP code)*
Bayonne Industries, Inc.
Foot of East 22nd Street
Bayonne, Hudson County, New Jersey

DATE OF LAST PREVIOUS INVESTIGATION BY EPA/STATE
No previous inspection report available.

FINDINGS

SECTION G - Records and Reports

RECORDS AND REPORTS MAINTAINED AS REQUIRED BY PERMIT. ☒ YES ☐ NO ☐ N/A *(Further explanation attached X)*
DETAILS:

(a) ADEQUATE RECORDS MAINTAINED OF:			
(i) SAMPLING DATE, TIME, EXACT LOCATION	☒ YES	☐ NO	☐ N/A
(ii) ANALYSES DATES, TIMES	☐ YES	☒ NO	☐ N/A
(iii) INDIVIDUAL PERFORMING ANALYSIS	☒ YES	☐ NO	☐ N/A
(iv) ANALYTICAL METHODS/TECHNIQUES USED	☒ YES	☐ NO	☐ N/A
(v) ANALYTICAL RESULTS *(e.g., consistent with self-monitoring report data)*	☐ YES	☒ NO	☐ N/A
(b) MONITORING RECORDS *(e.g., flow, pH, D.O., etc.)* MAINTAINED FOR A MINIMUM OF THREE YEARS INCLUDING ALL ORIGINAL STRIP CHART RECORDINGS *(e.g. continuous monitoring instrumentation, calibration and maintenance records)*.	☒ YES	☐ NO	☐ N/A
(c) LAB EQUIPMENT CALIBRATION AND MAINTENANCE RECORDS KEPT.	☒ YES	☐ NO	☐ N/A
(d) FACILITY OPERATING RECORDS KEPT INCLUDING OPERATING LOGS FOR EACH TREATMENT UNIT.	☒ YES	☐ NO	☐ N/A
(e) QUALITY ASSURANCE RECORDS KEPT.	☐ YES	☒ NO	☐ N/A
(f) RECORDS MAINTAINED OF MAJOR CONTRIBUTING INDUSTRIES *(and their compliance status)* USING PUBLICLY OWNED TREATMENT WORKS.	☐ YES	☐ NO	☒ N/A

SECTION H - Permit Verification

INSPECTION OBSERVATIONS VERIFY THE PERMIT. ☒ YES ☐ NO ☐ N/A *(Further explanation attached ____)*
DETAILS:

(a) CORRECT NAME AND MAILING ADDRESS OF PERMITTEE.	☒ YES	☐ NO	☐ N/A
(b) FACILITY IS AS DESCRIBED IN PERMIT.	☒ YES	☐ NO	☐ N/A
(c) PRINCIPAL PRODUCT(S) AND PRODUCTION RATES CONFORM WITH THOSE SET FORTH IN PERMIT APPLICATION.	☒ YES	☐ NO	☐ N/A
(d) TREATMENT PROCESSES ARE AS DESCRIBED IN PERMIT APPLICATION.	☒ YES	☐ NO	☐ N/A
(e) NOTIFICATION GIVEN TO EPA/STATE OF NEW, DIFFERENT OR INCREASED DISCHARGES.	☐ YES	☐ NO	☒ N/A
(f) ACCURATE RECORDS OF RAW WATER VOLUME MAINTAINED.	☐ YES	☐ NO	☒ N/A
(g) NUMBER AND LOCATION OF DISCHARGE POINTS ARE AS DESCRIBED IN PERMIT.	☒ YES	☐ NO	☐ N/A
(h) CORRECT NAME AND LOCATION OF RECEIVING WATERS.	☒ YES	☐ NO	☐ N/A
(i) ALL DISCHARGES ARE PERMITTED.	☒ YES	☐ NO	☐ N/A

SECTION I - Operation and Maintenance

TREATMENT FACILITY PROPERLY OPERATED AND MAINTAINED. ☒ YES ☐ NO ☐ N/A *(Further explanation attached X)*
DETAILS:

(a) STANDBY POWER OR OTHER EQUIVALENT PROVISIONS PROVIDED.	☐ YES	☒ NO	☐ N/A
(b) ADEQUATE ALARM SYSTEM FOR POWER OR EQUIPMENT FAILURES AVAILABLE.	☒ YES	☐ NO	☐ N/A
(c) REPORTS ON ALTERNATE SOURCE OF POWER SENT TO EPA/STATE AS REQUIRED BY PERMIT.	☒ YES	☐ NO	☐ N/A
(d) SLUDGES AND SOLIDS ADEQUATELY DISPOSED.	☐ YES	☐ NO	☒ N/A
(e) ALL TREATMENT UNITS IN SERVICE.	☒ YES	☐ NO	☐ N/A
(f) CONSULTING ENGINEER RETAINED OR AVAILABLE FOR CONSULTATION ON OPERATION AND MAINTENANCE PROBLEMS.	☒ YES	☐ NO	☐ N/A
(g) QUALIFIED OPERATING STAFF PROVIDED.	☒ YES	☐ NO	☐ N/A
(h) ESTABLISHED PROCEDURES AVAILABLE FOR TRAINING NEW OPERATORS.	☒ YES	☐ NO	☐ N/A
(i) FILES MAINTAINED ON SPARE PARTS INVENTORY, MAJOR EQUIPMENT SPECIFICATIONS, AND PARTS AND EQUIPMENT SUPPLIERS.	☒ YES	☐ NO	☐ N/A
(j) INSTRUCTIONS FILES KEPT FOR OPERATION AND MAINTENANCE OF EACH ITEM OF MAJOR EQUIPMENT.	☒ YES	☐ NO	☐ N/A
(k) OPERATION AND MAINTENANCE MANUAL MAINTAINED.	☒ YES	☐ NO	☐ N/A
(l) SPCC PLAN AVAILABLE.	☒ YES	☐ NO	☐ N/A
(m) REGULATORY AGENCY NOTIFIED OF BY PASSING. *(Dates ____)*	☐ YES	☐ NO	☒ N/A
(n) ANY BY-PASSING SINCE LAST INSPECTION.	☐ YES	☐ NO	☒ N/A
(o) ANY HYDRAULIC AND/OR ORGANIC OVERLOADS EXPERIENCED.	☐ YES	☐ NO	☒ N/A

Form Approved
OMB No. 158-R0073

PERMIT NO. NJ 0001341

SECTION J - Compliance Schedules

PERMITTEE IS MEETING COMPLIANCE SCHEDULE. ☒ YES ☐ NO ☐ N/A *(Further explanation attached ____)*

CHECK APPROPRIATE PHASE(S):

- ☐ (a) THE PERMITTEE HAS OBTAINED THE NECESSARY APPROVALS FROM THE APPROPRIATE AUTHORITIES TO BEGIN CONSTRUCTION.
- ☐ (b) PROPER ARRANGEMENT HAS BEEN MADE FOR FINANCING *(mortgage commitments, grants, etc.)*.
- ☐ (c) CONTRACTS FOR ENGINEERING SERVICES HAVE BEEN EXECUTED.
- ☐ (d) DESIGN PLANS AND SPECIFICATIONS HAVE BEEN COMPLETED.
- ☐ (e) CONSTRUCTION HAS COMMENCED.
- ☐ (f) CONSTRUCTION AND/OR EQUIPMENT ACQUISITION IS ON SCHEDULE.
- ☒ (g) CONSTRUCTION HAS BEEN COMPLETED.
- ☒ (h) START-UP HAS COMMENCED.
- ☐ (i) THE PERMITTEE HAS REQUESTED AN EXTENSION OF TIME.

SECTION K - Self-Monitoring Program

Part 1 – Flow measurement *(Further explanation attached X)*

PERMITTEE FLOW MEASUREMENT MEETS THE REQUIREMENTS AND INTENT OF THE PERMIT. DETAILS:	☐ YES	☒ NO	☐ N/A
(a) PRIMARY MEASURING DEVICE PROPERLY INSTALLED.	☐ YES	☒ NO	☐ N/A
TYPE OF DEVICE: ☐ WEIR ☐ PARSHALL FLUME ☒ MAGMETER ☐ VENTURI METER ☐ OTHER *(Specify ____)*			
(b) CALIBRATION FREQUENCY ADEQUATE. *(Date of last calibration 78/05/01)*	☒ YES	☐ NO	☐ N/A
(c) PRIMARY FLOW MEASURING DEVICE PROPERLY OPERATED AND MAINTAINED.	☒ YES	☐ NO	☐ N/A
(d) SECONDARY INSTRUMENTS *(totalizers, recorders, etc.)* PROPERLY OPERATED AND MAINTAINED.	☐ YES	☒ NO	☐ N/A
(e) FLOW MEASUREMENT EQUIPMENT ADEQUATE TO HANDLE EXPECTED RANGES OF FLOW RATES.	☒ YES	☐ NO	☐ N/A

Part 2 – Sampling *(Further explanation attached X)*

PERMITTEE SAMPLING MEETS THE REQUIREMENTS AND INTENT OF THE PERMIT. DETAILS:	☐ YES	☒ NO	☐ N/A
(a) LOCATIONS ADEQUATE FOR REPRESENTATIVE SAMPLES.	☒ YES	☐ NO	☐ N/A
(b) PARAMETERS AND SAMPLING FREQUENCY AGREE WITH PERMIT.	☐ YES	☒ NO	☐ N/A
(c) PERMITTEE IS USING METHOD OF SAMPLE COLLECTION REQUIRED BY PERMIT. IF NO, ☒ GRAB ☐ MANUAL COMPOSITE ☐ AUTOMATIC COMPOSITE FREQUENCY multiple 3/1	☒ YES	☐ NO	☐ N/A
(d) SAMPLE COLLECTION PROCEDURES ARE ADEQUATE.	☐ YES	☒ NO	☐ N/A
(i) SAMPLES REFRIGERATED DURING COMPOSITING	☐ YES	☒ NO	☐ N/A
(ii) PROPER PRESERVATION TECHNIQUES USED	☒ YES	☐ NO	☐ N/A
(iii) FLOW PROPORTIONED SAMPLES OBTAINED WHERE REQUIRED BY PERMIT	☐ YES	☐ NO	☒ N/A
(iv) SAMPLE HOLDING TIMES PRIOR TO ANALYSES IN CONFORMANCE WITH 40 CFR 136.3	☐ YES	☒ NO	☐ N/A
(e) MONITORING AND ANALYSES BEING PERFORMED MORE FREQUENTLY THAN REQUIRED BY PERMIT.	☐ YES	☒ NO	☐ N/A
(f) IF (e) IS YES, RESULTS ARE REPORTED IN PERMITTEE'S SELF-MONITORING REPORT.	☐ YES	☐ NO	☒ N/A

Part 3 – Laboratory *(Further explanation attached ____)*

PERMITTEE LABORATORY PROCEDURES MEET THE REQUIREMENTS AND INTENT OF THE PERMIT. DETAILS:	☒ YES	☐ NO	☐ N/A
(a) EPA APPROVED ANALYTICAL TESTING PROCEDURES USED. *(40 CFR 136.3)*	☒ YES	☐ NO	☐ N/A
(b) IF ALTERNATE ANALYTICAL PROCEDURES ARE USED, PROPER APPROVAL HAS BEEN OBTAINED.	☐ YES	☐ NO	☒ N/A
(c) PARAMETERS OTHER THAN THOSE REQUIRED BY THE PERMIT ARE ANALYZED.	☐ YES	☒ NO	☐ N/A
(d) SATISFACTORY CALIBRATION AND MAINTENANCE OF INSTRUMENTS AND EQUIPMENT.	☒ YES	☐ NO	☐ N/A
(e) QUALITY CONTROL PROCEDURES USED.	☒ YES	☐ NO	☐ N/A
(f) DUPLICATE SAMPLES ARE ANALYZED. 0 % OF TIME.	☐ YES	☒ NO	☐ N/A
(g) SPIKED SAMPLES ARE USED. 0 % OF TIME.	☐ YES	☒ NO	☐ N/A
(h) COMMERCIAL LABORATORY USED.	☒ YES	☐ NO	☐ N/A
(i) COMMERCIAL LABORATORY STATE CERTIFIED.	☒ YES	☐ NO	☐ N/A

LAB NAME New York Testing Laboratories

LAB ADDRESS 81 Urban Avenue, Westbury, Long Island, N.Y. 11590

(212) 297-1449 (516) 334-7770

Form Approved
OMB No. 158-R0073

PERMIT NO. NJ 0001341

SECTION L - Effluent/Receiving Water Observations *(Further explanation attached ____)*

OUTFALL NO.	OIL SHEEN	GREASE	TURBIDITY	VISIBLE FOAM	VISIBLE FLOAT SOL	COLOR	OTHER
001	X		X		X	X	

(Sections M and N: Complete as appropriate for sampling inspections)

SECTION M - Sampling Inspection Procedures and Observations *(Further explanation attached ____)*

- ☒ GRAB SAMPLES OBTAINED — Multiple grab 3/1, pH, Oil and Grease, Petroleum Hydrocarbons
- ☒ COMPOSITE OBTAINED — BOD_5, Turbidity
- ☒ FLOW PROPORTIONED SAMPLE — BOD_5, Turbidity
- ☐ AUTOMATIC SAMPLER USED
- ☐ SAMPLE SPLIT WITH PERMITTEE
- ☒ CHAIN OF CUSTODY EMPLOYED
- ☐ SAMPLE OBTAINED FROM FACILITY SAMPLING DEVICE

COMPOSITING FREQUENCY 100 ml/30 minutes PRESERVATION Yes - where required

SAMPLE REFRIGERATED DURING COMPOSITING: ☒ YES ☐ NO

SAMPLE REPRESENTATIVE OF VOLUME AND NATURE OF DISCHARGE Yes

SECTION N - Analytical Results *(Attach report if necessary)*

Parameter	Outfall 001 Grab #1	Grab #2	Grab #3	Average	Influent
Flow (MGD)				0.34	
pH	7.4	7.2	7.2	7.3	
Oil and Grease (mg/l)	128.0	91.3	62.0	93.8	
Turbidity (NTU)				20	
BOD_5 (mg/l)				42	47
Petroleum Hydrocarbons (mg/l)	20.5	4.3	8.2	11.0	

Additional Information

Participating in the inspection were:

R.T. Schweidfeger - President, Bayonne Industries
J.J. Fruchtmann - Vice-President, Bayonne Industries
Walter Pytlik - Engineer and Licensed Treatment Plant Operator, Bayonne Industries
Roy Sullivan - Consultant to Bayonne Industries, Vice-President of Environics, Inc.

Section B - The effluent data in Section B was accumulated prior to start-up of the new treatment system. Mr. Sullivan stated that the effluent samples taken recently were in compliance with the permit limitations. These analytic results were not available at the plant but are in Mr. Sullivan's office at Environics. Based on Mr. Sullivan's verbal account, it is assumed that the effluent is presently within permit requirements. This will be verified when the monitoring report due on August 28, 1978 is received.

Section G - The monitoring records at the plant are incomplete. As mentioned above, some of the records of effluent analyses are maintained by Mr. Sullivan. The regular twice monthly test results from New York Testing are maintained at the plant site. The latest report available (late April sample) had test results for petroleum hydrocarbons but not oil

and grease. The permit requires both tests although no frequency is specified for petroleum hydrocarbon analyses. The only log book for the treatment system contains the daily readings from the flow totalizer and the water height in the holding lagoon. N.Y. Testing will asked to provide the date of analysis on future reports.

Section H - (d) The treatment system is as described in the engineering plans. The application's description of treatment is obsolete.

(f) The flow to the DAF unit is monitored.

(g) Some runoff from the Bayonne Industries tank farm drains to Platty Kill via an unpermitted outfall operated by Theobald Industries. Bayonne Industries has submitted a proposal to curb this runoff and direct it to the Bayonne Industries treatment system.

(i) See (g) above.

Section I - (n) The discharge from the Theobald Industries outfall is the only bypass.

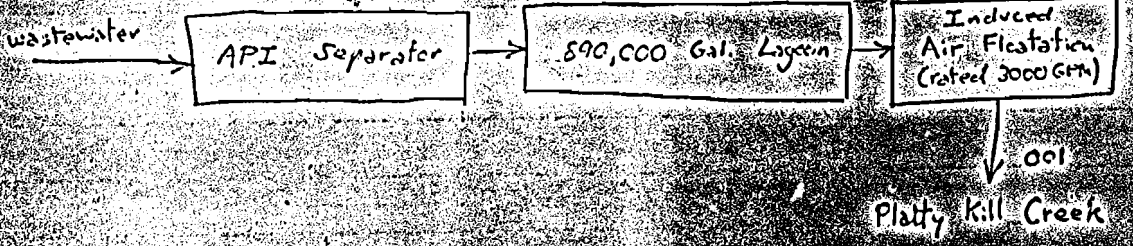
Section J - The permittee has complied with the schedule of EPA Consent Order II-77-104.

Section K - (d) No sample preservatives used by Bayonne Industries although Standard Methods gives H_2SO_4 preservation for Oil & Grease. This will be brought to the company's attention.

(f) The extra sampling was done after start-up of the new system. The permittee was advised to include this data in the report due 8/28/78.

Section L — The sampling point is at the DAF outlet. The sample taken here had no noticeable oil but did contain suspended solids. The receiving stream, the oil skimming pond section of Platty Kill Creek, is still covered with oil. It will be cleaned up by Bayonne Industries. The discharge to the creek contained some dark clumps (possibly grease) not observed upstream. One explanation (suggested by Mr. Sullivan) is that the oil in the creek backs up into the effluent pipe at times of unusually high tide. This oil is later washed out of the pipe by the effluent.

Treatment schematic



Miscellaneous — The State of New Jersey (DEP) and Bayonne Industries are developing a program to cleanse the groundwaters of oil by pumping out groundwater from wells and treating it. This will increase the volume of discharge 001.

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
P. O. BOX 2809
TRENTON, NEW JERSEY 08625

Mr. R.T. Schwedfeger
Bayonne Industries Inc.
Foot of East 22nd Street
Bayonne, New Jersey 07002

AUG 09 1977

Dear Mr. Schwedfeger:

We have received the following engineering reports concerning Bayonne Industries plans to meet the requirements of their NPDES Permit N.J.0001341:

"Preliminary Engineering Report for Establishment of Wastewater Treatment Facilities at Bayonne, N.J." dated January 13, 1977

"Existing Stormwater Drainage System and Proposed Alterations: Tenant Isolation and Collection/Treatment Facility" dated March 14, 1977

"Proposed Installation of Wastewater Pumping and Retention, and Treatment Facilities at Bayonne Industries Inc." dated July 1, 1977

These documents discuss the proposal by Bayonne Industries to separate the discharges of the tenant companys from Bayonne Industry's discharge and to construct a wastewater treatment facility to treat the dry weather flow and accumulated storm water runoff from Bayonne Industries. After reviewing these plans we have the following questions and comments which must be answered in order to complete our review:

1. Your reports have left great confusion concerning the requirements and capabilities of the proposed treatment plant. Drawing B1-436-1200 indicates an influent flow (Q) of 0.72 MGD. The same drawing indicates five pumps in three lift stations with a total capacity of 7600 GPM (11.5 MGD) all discharging to the gravity separator. On page 2 of your July 1, 1977 engineer's report you discuss a flow of 6500 GPM (9.4 MGD) achieved by the various lift pumps in wet weather discharging to the separator and the lagoon. On the same page you mention a dry weather flow of 1500 GPM (2.1 MGD). Again on page 2 you state that the air floatation

CCA000016

unit has a design flow of 3000 GPM (4.3 MGD). This would appear to set the limit for the system. Please clarify these statements and indicate the basis for design of this system.

2. It is necessary to establish the adequacy of the design flow for your proposed plant as established above to meet the requirements of wet weather. Your March 14 Engineer's Report states that the area to be drained is 34.8 acres (dike drainage closed) and 57.98 acres (dike drainage open). These acreages convert to 0.47 MG/in and 0.78 MG/in of rainfall. On page 7 of the same report you show curves for a 10 year/24 hour storm. How many inches per hour did you assume in constructing these curves? Please explain the use of these curves in arriving at the design flow for the proposed treatment plant and justify that the capacity of the system is adequate.

3. In the modified permit you are responsible for only your own discharge. Therefore we ask that you characterize your wastewater. Please indicate pH, TSS, and oil and grease.

4. We note that your plans have no provisions for adjusting pH and that there is no evident intent to control TSS. The July 1, 1977 engineer's report comments (page 7) that varying pH has produced inconclusive air floatation results. The effects of pH on emulsification of oils in water are well known. Please discuss this situation as it applies to Bayonne Industries.

5. Since the proposed system is designed to treat contaminated storm runoff it appears likely that there will be periods of high TSS. There are units in the system such as lagoon (1.2 days detention time) in which settling may take place. Please discuss the proposed system with respect to settling of solids and method of clean out.

6. We note that your design calls for achieving 10 mg/l of oil (ave.) and 15 mg/l (max.) as required by your NPDES Permit. We call your attention to the N.J. Water Quality Standards realtive to floating, suspended, colloidal and settleable solids, color, petroleum hydrocarbons and other oils and greases. This requirement is stated in your NPDES Permit part 1, page 4, A.2.1A(1) and (2). These water quality standards require that a limit of <u>None Noticeable</u> be achieved for oil and grease. We question whether the proposed facilities will meet these requirements.

7. Please discuss the following units in your proposed treatment plant in greater detail.

(a) Gravity Separator: Please supply drawing of gravity separator showing dimensions, more detailed structure and capacity. Please discuss how oil will be skimmed in detail. The July 1, 1977 report states that oil recovered from the gravity separator will be stored, treated, and reused. Please discuss treatment.

(b) Lagoon: It appears from the July 1, 1977 engineer's report that the lagoon is joined onto the gravity separator. On page 1 of this engineer's report this lagoon is also referred to as a lagoon for storm water retention. Please supply more information regarding dimensions and structures of this unit and discuss the application of this unit as a storm water retention lagoon.

(c) Air Floatation: Drawing BI-436-1205 is not entirely clear. It appears that several DAF units are to be installed in a single lagoon. Is this correct? Please indicate the amounts and pressures of air charged to the DAF units. The engineer's report discusses the use of Betz DK681 or its equivalent. Please discuss the composition and function of these chemical additives and how they will be added.

(d) Oil Detector: Please discuss the oil detector unit in detail.

8. Your site plan does not indicate the company's boundaries. Please revise.

9. There are several administrative requirements lacking in your submittal. These are the following:

(a) Your WP-1 application* must be sealed by your professional engineer.

(b) You must submit a letter appointing your engineer to prepare and design the proposed facilities.

(c) You must present endorsements of the proposed treatment works by the municipality and the affected sewerage authority.

(d) The licensed professional engineer must state that the proposed treatment works are adequate to meet all applicable Federal and State effluent limitations and meet the requirements of "Rules and Regulations for Preparation and Submission of Plans for Sewer Systems and Wastewater Treatment Plants," N.J.A.C. 7:9-1 et seq. where applicable.

*Application is enclosed for seal.

10. None of the reports submitted treat the issue of possible ground water pollution problems. The company must present data to indicate whether there is a ground water pollution problem and must propose a program to deal with the problem if it is found to exist.

11. The existing oil skimming pond is water of the State of New Jersey and the Federal Government. Once the proposed wastewater treatment plant is in operation this skimming pond must be cleaned up and the dam removed or a permit must be obtained for its continued existence. In no case should the dam be removed until such preparations have been completed. Please indicate the Company's intention with regard to these problems in your reply.

Please feel free to call Mr. Elsaady if we can be of any further assistance. He can be reached at (609)-292-0686.

Very truly yours,

William Beggs

William Beggs
Principal Environmental Engineer
Pollution Control Monitoring,
Surveillance and Enforcement Element
Raritan and Interstate Basin

WB:X

Enclosure

cc: Dr. R. Baker, USEPA, Region II
Mr. John Frisco, USEPA, Region II
Mr. Leroy E. Sullivan III, Environics Inc.
Dr. A. Mytelka, I.S.C.
Mayor and Council of Bayonne City
Bayonne Sewerage Authority

New Jersey Pollutant Discharge Elimination System

The New Jersey Department of Environmental Protection hereby restricts and controls the discharge of pollutants to waters of the State from the subject facility/activity in accordance with applicable laws and regulations. The permittee is responsible for complying with all terms and conditions of this authorization and agrees to said terms and conditions as a requirement for the construction, installation, modification, or operation of any facility for the collection, treatment or discharge of any pollutant to waters of the State.

PERMIT NUMBER NJ0001341

Permittee	Co-Permittee
BAYONNE INDUSTRIES INC 250 EAST 22ND STREET BAYONNE NJ 07002	

Property Owner	Location of Activity
BAYONNE INDUSTRIES INC. 250 EAST 22ND STREET BAYONNE NJ 07002	BAYONNE INDUSTRIES INC. 250 EAST 22ND STREET BAYONNE NJ 07002

CURRENT AUTHORIZATION Covered By This Approval And Previous Authorization	Issuance Date	Effective Date	Expiration Date
J :SURFACE IMPOUNDMENT-INDUST	06/28/1985	08/01/1985	TERMINATED
RF :STORMWATER	06/28/1985	08/01/1985	07/31/1990
Termination of Category RF	00/00/0000	00/00/0000	TERMINATED

DSN: 001 **CLASSIFICATION:** SE-3

LATITUDE: N40° 40' 07" **LONGITUDE:** W74° 08' 07"

RECEIVING STREAM: Platty Kill Canal to Kill Van Kull

By Authority of:
COMMISSIONER'S OFFICE
DEP AUTHORIZATION
DEBRA HAMMOND, BUREAU CHIEF
BUREAU OF POINT SOURCE PERMITTING REGION 2
DIVISION OF WATER QUALITY

[redacted]

Terms, conditions and

State of New Jersey Department of Environmental Protection Division of Water Resources

CCA000017

BAYONNE INDUSTRIES, INC.

FOOT OF EAST 22ND STREET BAYONNE, NEW JERSEY 07002

PHONE: 437-2200

January 31, 2001

Mr. Michael Kenney
New Jersey Department of Environmental Protection
Division of Responsible Party Site Remediation
401 East State Street, CN 028
Trenton, New Jersey 08625-0028

RECEIVED

Re: Fourth Quarter Status Report (for October, November, December 2000)
Bayonne Industries, Inc., Bayonne, New Jersey

Dear Mr. Kenney:

Bayonne Industries, Inc. (BI) presents herewith the quarterly status report for the Westside Waterfront Interim Remedial Action (IRA) effort and relevant activities in the period October 1 through December 31, 2000. The Westside Waterfront (WWF) IRA provides for the monitoring and extraction of free product from five recovery wells and interceptor trench sumps which were installed at-risk by BI to control the migration of free phase product into the Kill Van Kull in the vicinity of Pier 1 and Pier A. This continues to be a very successful control initiative and the focus is now on long-term remediation of substantially contained residuals.

We also provide in these quarterly reports the status of our site-wide free product monitoring on ground water, of Co-Gen area recovery activities, and of activities associated with the Platty Kill Pond and Canal. In these reports we try to keep your office current as well on the interim status of other Memorandum of Agreement (MOA) actions. We understand that your receipt of this interim information does not imply particular approval on your part of all of our initiatives since such will be sought separately in a manner consistent with the guidelines for the formal submission of such requests. However, we feel it is useful to give you this status on an informational basis and your continued review of and response to these reports is appreciated.

Summary

1. The Westside Waterfront

a. Product Recovery - Free oil (product) recovery rates at the WWF have decreased from the third quarter, a routine experience due to the temporary system shutdown and draining necessary to prevent winter freezing damage. Free-product observed shoreward of the HDPE liner continues to diminish and product recovery behind and at the ends of the liner barrier is proceeding apace. Any potential for residual

product seepage toward the Kill Van Kull is monitored on a regular basis; there has been no indication of renewed exposure on this front.

b. NJDOT Storm Sewer - The closure of the NJDOT Storm Sewer was completed during this quarter. A section of the NJDOT Storm Sewer was excavated adjacent to the HDPE liner. A new section of HDPE liner was put into place where the sewer formerly penetrated a section of the waterfront barrier curtain. The liner seams were sealed with clay and the area backfilled. This work completes the perimeter control of free product migration towards the Westside Waterfront.

2. Platty Kill Pond

The Remedial Action Work Plan for the Platty Kill Pond (PKP) was submitted to the NJDEP on December 20, 2000. The design includes the installation of a containment barrier wall around the entire PKP, stabilization/fixation of the residual materials within the pond, filling of the remaining void and capping, implementation of the provisions of a restricted Deed Notice, and remediation performance verification. Forward engineering as outlined in the RAWP has been initiated at risk pending formal Department approval of the RAWP.

3. Platty Kill Canal

A soil-boring program at the Platty Kill Canal (PKC) is scheduled to start in January 2001. The objectives and scope of work were described in the Remedial Investigation Addendum Report for Sampling Clay-Till, which was previously submitted to your department. The primary objective of the program is to delineate the low permeability clay-till under the canal. Shelby tubes and vibrocore samples will be collected from the clay-till layer and the samples will be submitted to a laboratory for analysis of permeability at several locations.

4. Co-Gen Product Recovery

The pilot operation of the recovery system at the Co-Gen facility began on November 21, 2000. The system consists of two recovery wells, an oil/water separator and treatment of the water phase in the plant water treatment system. Oil is collected and recovery rates and volumes will continue to be reported in these regular Quarterly Reports.

5. Free Product Investigation Work Plan

The work outlined in the Free Product Investigation Work plan (FPIW) resumed in July with a different cone penetrometer (CPT) contractor. Yard 4 was completed after 62 probings and several incidents where the CPT equipment was damaged. Free product investigation in other areas will continue after renegotiating the contract terms with the CPT contractor. After review of the Yard 4 results, a decision will be made as to whether

proceed with the CPT as a screening tool, or to proceed with a more conventional approach. In either case a report is being prepared that will summarize the results of the CPT work to date.

6. Chromium

The BI site has been formally designated as one of the "orphan sites" with chromium contamination for which NJDEP is taking the lead on control. Another investigatory round is about to begin and BI will collaborate in a manner that does not compromise the concurrent FPIW work.

Detailed Commentary

1. Status of Westside Waterfront Product Recovery

Product recovery at the Westside Waterfront observed in the October through December 2000 Quarter was slightly below average. This is depicted on the Product Recovery Summary graph (Figure 1) and is partly due to the winter shutdown on November 20, 2000. A total of 514 gallons of free-phase product were recovered during the period of October 1 through November 20, 2000. This brings the cumulative total recovered to approximately 42,030 gallons since August, 1995. The collection rate is apparently linked to climatic conditions and where it is as yet premature to talk of downward trends, there are indications that we are approaching that point.

Regular inspections of the Waterfront and liquid level measurements from the monitoring wells and recovery sumps in the vicinity of the WWF continue to be conducted by IMTT personnel. These measurements of fluid levels made between the beginning of July 2000 and the end of September 2000 indicate relatively low product accumulation thickness in the recovery wells and sumps in proximity to the trench. Only limited differences in product thickness measurements made during both high and low tide are observed in the monitoring well network, as had been previously the case. Groundwater contour maps for two events, high and low tides and are included as Figures 2 and 4 respectively. A Water Level/Apparent Product Thickness Measurements summary for all wells at the WWF is also included here as Table 1 and Table 2. The thickness of free petroleum hydrocarbon as measured in the monitoring wells is considered here an apparent thickness rather than a true or formation thickness of the same product located beyond the well and resting on the water table.

Apparent product accumulations at the waterfront are illustrated in Figures 3 and 5, Apparent Free Product Thickness Westside Waterfront Maps. Beyond the HDPE Liner ends (at the gaps), Recovery Wells are now in place and operational at the east and west ends of the product curtain (the 4J Building Gap and near Walter's Bridge). As indicated in the tables, product has been obtained from these wells, particularly that in the vicinity of Walter's Bridge indicating the merit of their placement at these locations.

2. NJDOT Storm Sewer Closure

Property transfer of the NJDOT Storm Sewer was consummated in June 2000. As discussed in the October 20, 2000 Quarterly Report, BI conducted field investigations in the summer to determine the potential impact of closing the NJDOT Storm Sewer. The field investigations determined that water levels in the sewer were still being tidally influenced even after closing the tide chamber check valve. This is inconsistent with what was anticipated and indicated a leak in the lining the NJDOT installed in the sewer to prevent containment migration.

The NJDOT sewer line was closed as follows:

a. The tide chamber and manhole 8 were filled with concrete. This was completed to prevent water from the Kill Van Kull and groundwater infiltration in the NJDOT storm sewer from flooding the work area.

b. After the concrete cured, a section of the NJDOT storm sewer was excavated. During the excavation it was determined that the integrity of the NJDOT storm sewer liner was compromised and not properly sealed into the tide chamber. Specifically, the concrete outer pipe was approximately 2- feet short of the tide chamber and the inner HDPE liner was not sealed at the chamber (see Figure 6). This would explain why the water level in the NJDOT storm sewer continued to fluctuate after tide chamber check valve was closed.

The section of the NJDOT storm sewer was then removed.

c. The excavation was then expanded to expose the previously installed HDPE barrier wall. Plywood bracing was lowered into the excavation and joined to the existing barrier wall. New 80 mill HDPE liner material was installed on the landward surface of the plywood. The HDPE liner overlapped the existing liner and seams sealed with clay. Clean fill documentation for the clay is attached.

d. Three quarter inch gravel was placed into the excavation to allow product recovery along the barrier wall. The area was then backfilled with excavated soil. Excess soil was disposed offsite and disposal documentation is attached.

At this time it is believed that the measures implemented effectively contain free product in this area of the waterfront.

3. Platty Kill Pond

Most recently we have undertaken forward engineering tasks to determine a final selection for a perimeter hydraulic barrier around the PKP. The details of this have been

formally submitted to your office in the RAWP. Preliminary findings indicate that the sheetpile barrier is preferred to the grout wall containment solution. A final decision will be made with consideration to your pending comments on the RAWP.

The RAWP includes an aggressive schedule of forward engineering tasks with several critical path items that we request your team's feedback on prior to final approval. The feedback that we would like to receive and discuss during our meeting tentatively scheduled on or about February 14, 2001 includes the following items:

- *Containment wall selection and NJDEP approval criteria*
- *Sludge mixing approach (for permit considerations)*
- *Stabilization validation approach and criteria*
- *Soil reuse plan approach for canal and site wide materials*
- *Post remedial monitoring approach*

4. **Platty Kill Canal Sampling and "Hot Spot" Definition**

Adherence to the demanding calendar prescribed in the PKP RAWP and the PKC RASR will require particular attention to several critical path elements. Several of these depend directly on the State's review calendar. An informal review of these can take place at an anticipated mid February meeting with DEP staff. Further investigation of the continuity of the clay bottom at the Canal is being undertaken in early January as part of an RAWP preparation by the BI-ExxonMobil team. The Department has reviewed the particulars of this effort.

Additionally, a rational approach to delineating "hot spots" in the canal sediments for which removal and treatment are appropriate, has been presented to the department earlier and is included here in as Attachment A for review and discussion during our upcoming meeting.

The hot spot delineation is based on the containment solution proposed for the PKC and the solidification/stabilization and containment solution proposed for the PKP. The NJDEP Impact to Ground Water Soil Cleanup Criteria (IGWSCC) are used as the basis for the delineation. A concentration factor was calculated by dividing the concentration of a specific compound exceeding the IGWSCC by the corresponding criteria. This allows for an equal weighting or normalization of the various compounds found in the various PKC delineation samples. Sediments with contaminant levels above the Hot Spot Criteria are proposed for treatment and containment in conjunction with the PKP closure. Future containment of the PKC sediments ensures that this more lenient criterion is appropriate for the remaining materials that are under the Hot Spot Criteria.

5. Free Product Investigation Work plan

We are preparing and will submit a report for the two areas completed with the CPT, namely the Co-Gen and Yard 4 areas. The RI report will follow section 2.2.2 of the FPIW and the conditions outlined in your June 10, 1999 conditional approval (No. 2 Reporting, bullet 1) of the CPT work. Concurrently, we will complete our negotiations with the CPT contractor and proceed with the planned CPT work if negotiations are successful. If we cannot negotiate a cost effective and timely program, we will complete the areas outlined in the FPIW with a more conventional screening approach such as geoprobe borings and temporary wells. The results of all screening work will be incorporated into the "steps 3 and 4 workplan" conditioned in No. 2 (bullet 2) of your approval letter.

6. Co-Gen Product Recovery

The pilot operation of the recovery system at the Co-Gen facility began on November 21, 2000. The system consists of two recovery wells (RW-1 and RW-2), which are located across the eastern fence line of the Co-Gen property. Total fluids (floating oil and water) pumped from top loading pneumatic recovery pumps are directed to a pretreatment oil/water separator system. Oil is collected and recovery rates and volumes are measured and recorded by BI personnel.

The system recovered 16.8 gallons on free product during the initial startup in December. The pumping levels will be modified and monitored to determine the optimum pumping levels for the system during the fist quarter 2001. Product recovery rates will continue to be monitored and reported in these quarterly reports consistent with reporting for the west side waterfront.

We hope you find this report informative and reflective of consistent progress in our remediation work. Please contact us for such additional information that you feel may be helpful at this time.

Very truly yours,

Robert Weaver, PhD/PE

cc: Mr. E. J. Walker
Mr. R. Fisette (no attachments)
Mr. George M. Bress, PE
Mr. A. Cozzi, CPG (Bluestone Environmental)

TABLES

Table 1 - Water Level/Apparent Product Thickness Measurements-Low Tide
Table 2 - Water Level/Apparent Product Thickness Measurements-High Tide

FIGURES

Figure 1 - Product Recovery Summary Graph
Figure 2 - Groundwater Elevation Contour Map - Westside Waterfront - High Tide
Figure 3 - Apparent Product Thickness Contour Map - Westside Waterfront - High Tide
Figure 4 - Groundwater Elevation Contour Map - Westside Waterfront - Low Tide
Figure 5 - Apparent Product Thickness Contour Map - Westside Waterfront – Low Tide

ATTACHMENTS

Hot Spot Map
Disposal Documentation
Clean Fill Certificate

TABLE 1: FACTOR TOTAL FOR SLUDGE SAMPLES COLLECTED FROM THE PLATTY KILL CANAL BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY

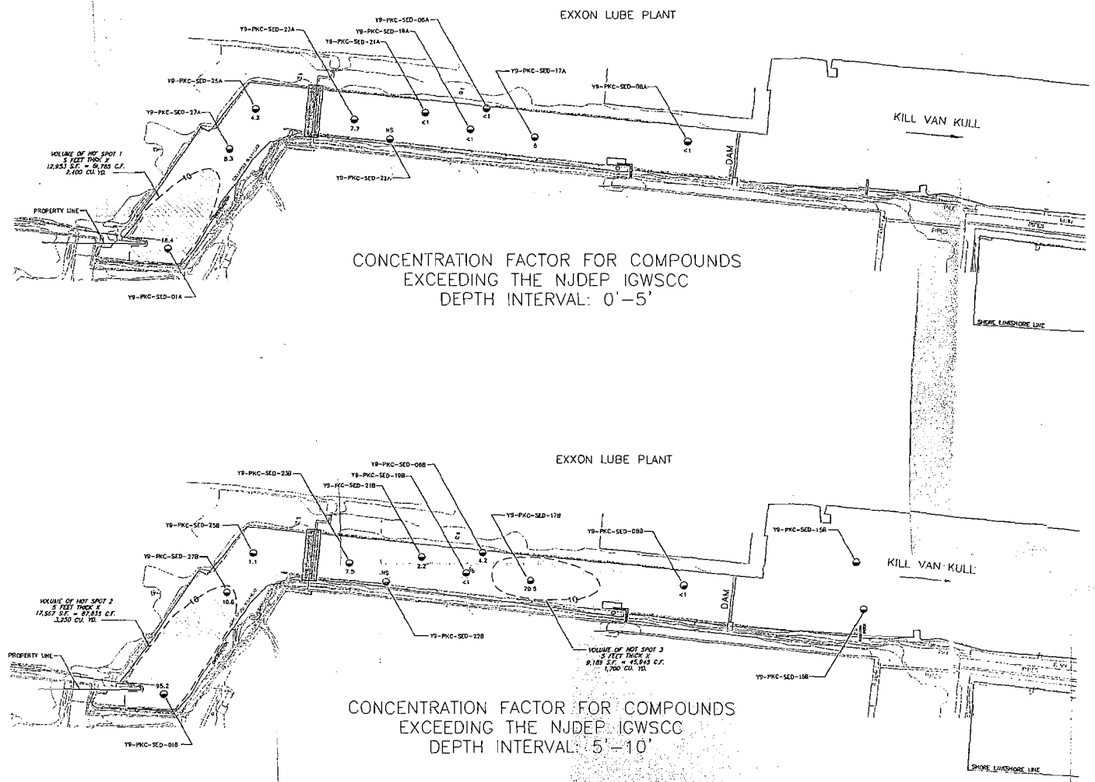
Sample ID	PKCSED17A	PKCSED17B	PKCSED17C	PKCSED19A	PKCSED19B	PKCSED19C	PKCSED21A	PKCSED21B	PKCSED21C	NJDEP
Depth (ft.)	0 - 5	5 - 10	10 - 15	0 - 5	5 - 10	10 - 15	0 - 5	5 - 10	10 - 15	IGWSCC
Sampling Date	06/06/96	06/06/96	06/06/96	06/06/96	06/06/96	06/06/96	06/06/96	06/06/96	06/06/96	
VOLATILES (UG/KG)	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	
Chlorobenzene	6,000 6	ND	ND	ND	ND	ND	ND	ND	ND	1,000
Total Xylenes	4,300	190,000 2.8	120,000 1.8	ND	12,000	220,000 3.3	4,600	130,000 2.2	150,000 2.2	67,000
SEMI-VOLATILES (UG/KG)										
Diethylphthalate	9,000	730,000 15.8	4,200	ND	ND	9,900	ND	ND	ND	50,000
Naphthalene	5,400	190,000 1.9	54,000	ND	10,000	280,000 2.6	69,000	90,000	61,000	100,000
FACTOR TOTAL	***6***	***20.5***	***1.8***			***5.9***		***2.2***	***2.2***	

Sample ID	PKCSED23A	PKCSED23B	PKCSED23C	PKCSED25A	PKCSED25B	PKCSED25C	PKCSED27A	PKCSED27B	PKCSED27C	NJDEP
Depth (ft.)	0 - 5	5 - 10	10 - 15	0 - 5	5 - 10	10 - 15	0 - 5	5 - 10	10 - 15	IGWSCC
Sampling Date	06/06/96	06/06/96	06/06/96	06/06/96	06/06/96		06/07/96	06/07/96	06/07/96	
VOLATILES (UG/KG)	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	
Chlorobenzene	7,700 7.7	ND	ND	4,200 4.2	ND	NA	8,300 8.3	ND	ND	1,000
Total Xylenes	20,000	500,000 7.5	230,000 3.4	ND	ND	NA	25,000	490,000 7.3	330,000 4.9	67,000
SEMI-VOLATILES (UG/KG)										
Naphthalene	11,000	70,000	70,000	ND	ND	NA	28,000	220,000 2.2	160,000 1.6	100,000
Acenaphthene	6,800	13,000	10,000	28,000	110,000 1.1	NA	14,000	36,000	ND	100,000
Fluorene	9,900	38,000	46,000	ND	ND	NA	25,000	110,000 1.1	130,000 1.3	100,000
FACTOR TOTAL	***7.7***	***7.5***	***3.4***	***4.2***	***1.1***		***8.3***	***10.6***	***7.8***	

Sample ID	PKCSED01A	PKCSED01B	PKCSED01C	PKCSED06A	PKCSED06B	PKCSED06C	PKCSED08A	PKCSED08B	PKCSED08C	NJDEP
Depth (ft.)	0 - 3	3 - 6		0 - 4.5	4.5 - 9		0 - 3.25	3.25 - 6.5		IGWSCC
Sampling Date	10/21/94	10/21/94		10/20/94	10/20/94		10/20/94	10/20/94		
VOLATILES (UG/KG)	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	Concent. Fact.	
Chlorobenzene	13,000 13	65,000 65	NA	ND	ND	NA	ND	140	NA	1,000
Benzene	3,300 3.3	28,000 28	NA	14	2,700 2.7	NA	ND	17	NA	1,000
Total Xylenes	6,600	81,000 1.2	NA	17	98,000 1.5	NA	33	27	NA	67,000
SEMI-VOLATILES (UG/KG)										
Naphthalene	210,000 2.1	100,000 1	NA	770	66,000	NA	120	2,400	NA	100,000
FACTOR TOTAL	***18.4***	***95.2***			***4.2***					

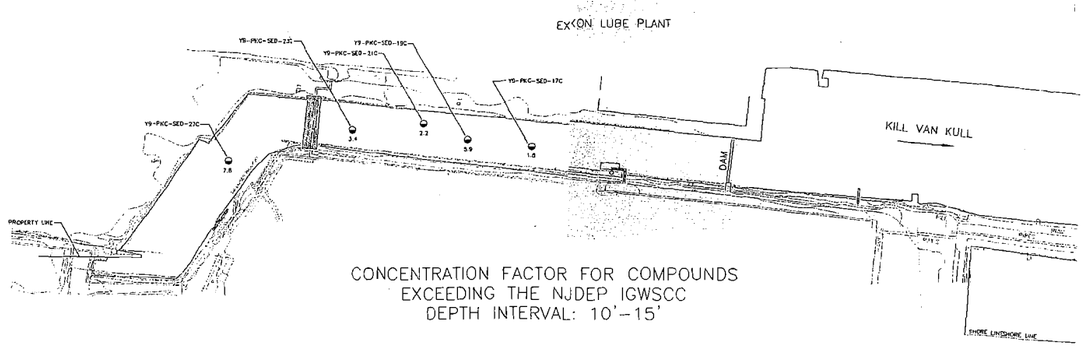
NOTES

ND : Compound was not detected
NP : No Proposed Cleanup level available
NA : Not Analyzed
: Parameters are above the NJDEP Impact to Groundwater Soil Cleanup Criteria
IGWSCC : Impact to Ground Water Soil Cleanup Criteria.
Concentration factor was calculated by dividing the concentration of a specific compound exceeding the NJDEP IGWSCC by the corresponding criteria. All factors exceeding the NJDEP IGWSCC were added to obtain the FACTOR TOTAL.



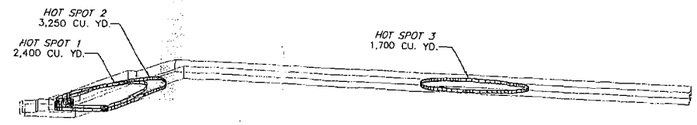
CONCENTRATION FACTOR FOR COMPOUNDS
EXCEEDING THE NJDEP IGWSCC
DEPTH INTERVAL: 0'–5'

CONCENTRATION FACTOR FOR COMPOUNDS
EXCEEDING THE NJDEP IGWSCC
DEPTH INTERVAL: 5'–10'



CONCENTRATION FACTOR FOR COMPOUNDS
EXCEEDING THE NJDEP IGWSCC
DEPTH INTERVAL: 10'–15'

CROSS SECTION OF CANAL SHOWING HOT SPOTS



HOT SPOT 1	2,400 CU. YD.
HOT SPOT 2	3,250 CU. YD.
HOT SPOT 3	1,700 CU. YD.
TOTAL	7,350 CU. YD.

NOTES:

1) CONCENTRATION FACTOR WAS CALCULATED BY DIVIDING THE CONCENTRATION OF A SPECIFIC COMPOUND BY THE CORRESPONDING NJDEP IMPACT TO GROUNDWATER SOIL CLEANUP CRITERIA (IGWSCC). ALL FACTORS EXCEEDING THE NJDEP IGWSCC WERE ADDED AND THE FINAL NUMBER WAS USED TO PREPARE THE CONCENTRATION FACTOR CONTOUR MAP.

HOT SPOT CALCULATION EXAMPLE: NAPHTHALENE IN PKC-SED-27B CONCENTRATION DIVIDED BY IGWSCC = FACTOR

220,000 ug/kg DIVIDED BY 100,000 ug/kg = 2.2

2) VALUES REPORTED FOR SAMPLING LOCATIONS Y9-PKC-SED-01, Y9-PKC-SED-06, AND Y9-PKC-SED-08 ARE FROM THE OCTOBER 1994 SAMPLING EVENT, REPORTED IN THE ENSR PKP INTERIM REMEDIAL ACTION REPORT DATED NOVEMBER 1994.

3) VALUES REPORTED FOR SAMPLING LOCATIONS Y9-PKC-SED-17, Y9-PKC-SED-19, Y9-PKC-SED-21, Y9-PKC-SED-23, Y9-PKC-SED-25, AND Y9-PKC-SED-27 ARE FROM THE JUNE 1996 SAMPLING EVENT.

4) Y9-PKC-SED-22 NOT SAMPLED DUE TO VIBROCORE REFUSAL AT 1 FOOT BELOW SUBSTRATE SURFACE.

LEGEND

10 — CONCENTRATION FACTOR CONTOUR INTERVAL (DASHED WHERE INFERRED)

8.3 — BORING LOCATION AND CONCENTRATION FACTOR FOR COMPOUNDS EXCEEDING NJDEP IMPACT TO GROUNDWATER SOIL CLEANUP CRITERIA (IGWSCC)

NS — NO SAMPLE DUE TO POOR RECOVERY

0 50 100 200
SCALE: 1"=100'

F-0822-01

CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CHK'D BY	APP'D BY

BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.
35 ZELLER DRIVE
SOMERSET, NEW JERSEY 08873

PREPARED FOR: ExxonMobil

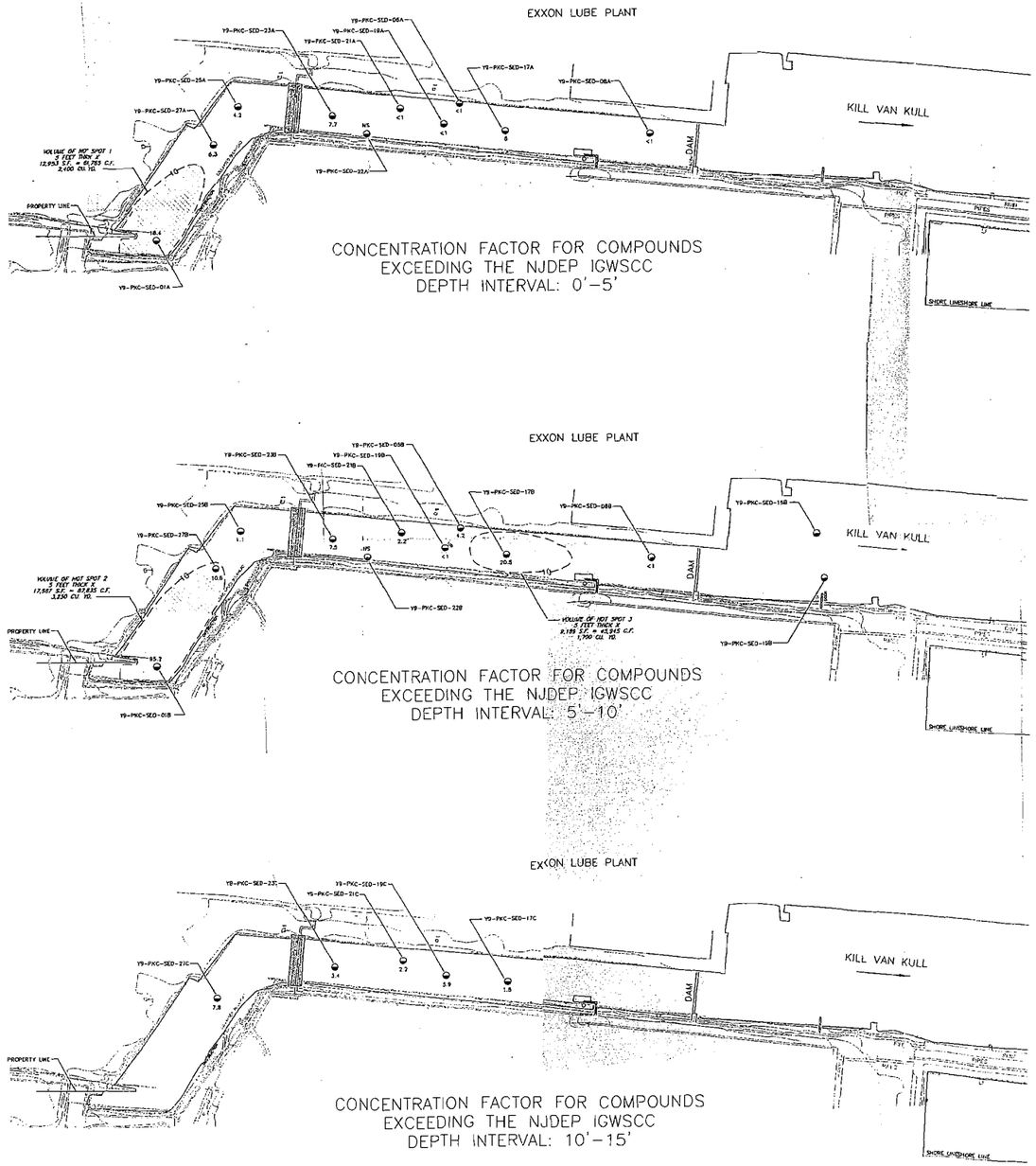
PREPARED FOR: BAYONNE INDUSTRIES, INC.
BAYONNE
NEW JERSEY

SHEET —

SITE/DESCRIPTION: CONCENTRATION FACTOR CONTOUR MAP
PROPOSED HOT SPOT REMOVAL AREA

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
JJG	DAR	AMC	RCW	06/07/00	FIG. 5	0

D:\ACAD\BLUESTONE\F-0822-01.dwg Fri Jan 05 08:21:16 2001

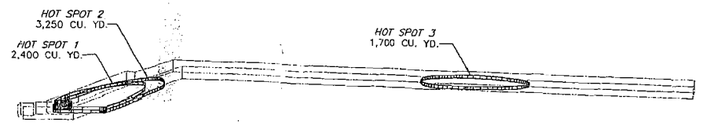


CONCENTRATION FACTOR FOR COMPOUNDS EXCEEDING THE NJDEP IGWSCC DEPTH INTERVAL: 0'–5'

CONCENTRATION FACTOR FOR COMPOUNDS EXCEEDING THE NJDEP IGWSCC DEPTH INTERVAL: 5'–10'

CONCENTRATION FACTOR FOR COMPOUNDS EXCEEDING THE NJDEP IGWSCC DEPTH INTERVAL: 10'–15'

CROSS SECTION OF CANAL SHOWING HOT SPOTS



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4) Y9-PKC-SED-22 NOT SAMPLED DUE TO VIBROCORE REFUSAL AT 1 FOOT BELOW SUBSTRATE SURFACE.

LEGEND

10 — CONCENTRATION FACTOR CONTOUR INTERVAL (DASHED WHERE INFERRED)

8.3 — BORING LOCATION AND CONCENTRATION FACTOR FOR COMPOUNDS EXCEEDING NJDEP IMPACT TO GROUNDWATER SOIL CLEANUP CRITERIA (IGWSCC)

NS — NO SAMPLE DUE TO POOR RECOVERY

0 50 100 200
SCALE: 1"=100'

F-0822-01
CADD DWG. FILE

REV. NO.	REV. DESCRIPTION	DATE	DSI BY	CK'D BY	APP'D BY

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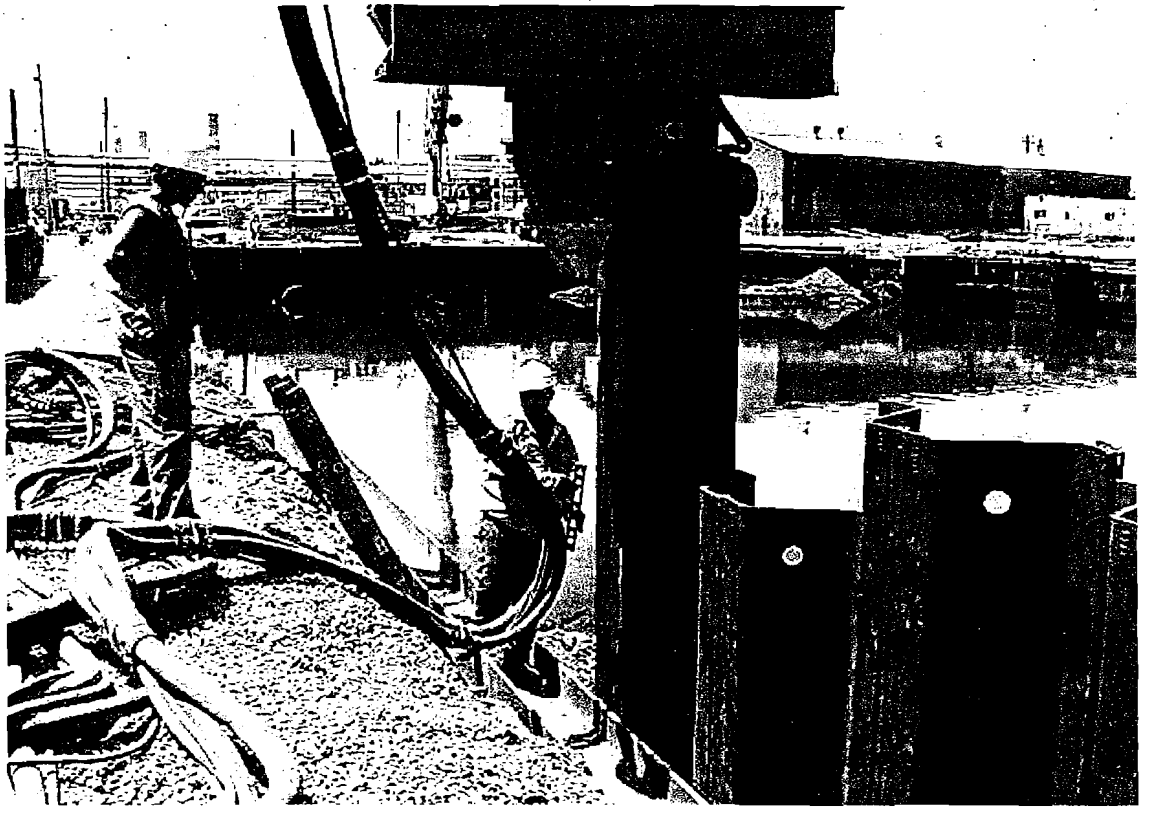
BAYONNE
NEW JERSEY

SHEET —

SITE/DESCRIPTION: CONCENTRATION FACTOR CONTOUR MAP
PROPOSED HOT SPOT REMOVAL AREA

DESCRIED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
JID	DAR	AMC	RCW	09/07/00	FIG. –	0

D:\ACAD\BLUESTONE\F-0822-01.dwg Fri Jan 05 09:21:16 2001



Remedial Action Workplan Addendum

Platty Kill Pond Closure

Bayonne, New Jersey

Prepared For:

Bayonne Industries, Inc.

BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.
489 Union Avenue, Suite C
Bridgewater, New Jersey
732 469-5188 / (fax) 732 469-5187

January 2004

CERTIFICATIONS - N.J.A.C. 7:26-1.2 et. seq.

Any person making a submission to the Department required by this chapter and pursuant to N.J.A.C. 7:26E, shall include the following signature and notarized certification, for each technical submittal. Additionally, the certification shall indicate the case name and address, case number, type of documents submitted, e.g. Remedial Action Report, for each technical submittal.

TYPE OF DOCUMENT Remedial Action Workplan Addendum

CASE NAME Platty Kill Pond Closure

CASE ADDRESS 250 East 22nd St., Bayonne, New Jersey

CASE NUMBER 01-03-07-1649-03

"I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge. I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement that I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

PRINTED NAME Richard R. Fisette TITLE Terminal Manager - Vice President

SIGNATURE [signature] DATE 1-22-04

SUBSCRIBED AND SWORN BEFORE ME
THE DAY AND YEAR ABOVE WRITTEN
Carmel L. Sierp

CARMEL L. SIERP
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires July 11, 2005

CERTIFICATE

I, Bertrand F. Artigues, hereby certify that I am the Secretary and official custodian of certain minutes of meetings of the Board of Directors of Bayonne Industries, Inc. ("Corporation"), a corporation duly organized and existing under the laws of the State of Delaware, and that the following is a true, accurate and compared transcript of resolutions contained in the minute book for the Corporation duly adopted by unanimous written consent of the Board of Directors of said Corporation on November 21, 2000, that said resolutions have not been amended or revoked, are now in full force and effect and no other resolutions have been adopted by the Board of Directors of the Corporation in connection with the following:

> **RESOLVED**, that Richard R. Fisette, the Terminal Manager of Bayonne Industries, Inc., be and is hereby authorized by the Board of Directors to negotiate, execute and deliver any and all certifications, reports, questionnaires, notifications, and/or renewals in connection with United States of America, State of New Jersey, Hudson County, and/or City of Bayonne regulatory compliance, safety and/or environmental matters.

IN WITNESS WHEREOF, these presents were drawn up as of November 21, 2000.

BERTRAND F. ARTIGUES,
Secretary of the Board of Directors
of Bayonne Industries, Inc.

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1.0 INTRODUCTION

This document presents the Remedial Action Work Plan (RAWP) Addendum as follow-up to the original RAWP submitted to the New Jersey Department of Environmental Protection (NJDEP) on December 18, 2000. This Addendum is in response to the following NJDEP and Bayonne Industries, Inc. (BI) correspondences:

- NJDEP Conditional Approval letter dated May 18, 2001
- Bluestone Environmental Services Technical Memorandum dated June 26, 2001
- NJDEP Response to Additional Work letter dated March 7, 2002
- BI Response to Comments letter dated March 19, 2002
- Bluestone Environmental Services letter dated July 9, 2002
- NJDEP Clarification letter dated September 13, 2002
- BI Response to Comments letter dated September 25, 2002

Copies of these correspondences are provided in Appendix A.

It is the intent of this submittal to ultimately lead to an approved closure plan and a "no further action" determination from the NJDEP for the Platty Kill Pond (PKP) located at the BI site in Bayonne, New Jersey.

As stated in the RAWP, the final design will include stabilization and fixation of the sludge contained in the pond, backfilling to surface grade, capping, and site restoration in the former pond area. A barrier around the pond will control the potential migration of any residual contamination. Post construction monitoring programs are included as part of this final plan.

This RAWP Addendum addresses the NJDEP's Conditions/Responses/Clarifications as outlined in the NJDEP May 18, 2001 correspondence. Additional information in reference to the NJDEP's subsequent correspondence of March 7, 2002 (Responses) and September 13, 2002 (Clarifications) are contained and addressed in this Addendum including the following:

1. Applicable Remediation Standards

2. Pre-Construction Activities
    A. Platty Kill Pond Pipeline Closure
    B. Final Pond Residual Material Stabilization Reagent Mixture & Design
    C. Water Management Program/Final Cap Design

3. Remedial Action Methodology
    A. Containment Wall Installation
    B. Pond Residual Material Stabilization

4. Remediation Performance Verification

5. Soil Reuse Plan

6. Construction Monitoring Plans

7. Long-Term Monitoring

8. Draft Deed Notice

9. Classification Exception Area

10. Project Schedule

11. Health and Safety Plan

12. Quality Assurance Project Plan

2.0 APPLICABLE REMEDIATION STANDARDS

The applicable remediation standards for the PKP remedial action are the Non-Residential or Restricted Use Direct Contact Soil Cleanup Criteria (NRDCSCC or RUDCSCC) and the Impact to Groundwater Soil Cleanup Criteria (IGWSCC). If post-remedial action soil concentrations exceed the NRDCSCC, engineering controls will be implemented as necessary. Engineering controls are included as key aspects of this RAWP Addendum.

The institutional and engineering controls proposed herein are designed to document, stabilize, solidify, and contain any of the contaminants of concern and reduce any unacceptable risk of exposure to humans or the environment. This component of the remedy provides insurance that contaminants coming towards the PKP are addressed while providing a redundant control for the unlikely possibility of contaminants migrating beyond the containment wall. In addition, free-product recovery is being implemented along three sides of the PKP. Together, these controls ensure that contaminant concentrations remaining in the soils in the PKP will not pose an unreasonable threat to human health during future site use and to assure that any remaining contamination is properly managed. In implementing the institutional and engineering controls, all requirements pursuant to N.J.S.A. 58:10B-13 will be met. These requirements are summarized as follows:

- Establishment of institutional and/or engineering controls which limit actual or potential, present or future risk of exposure to humans or the environment to residual contamination remaining on-site,

- All contaminants exceeding their respective Residential or Unrestricted Use Direct Contact Soil Cleanup Criteria (RDCSCC or URUDCSCC) must be identified on a Deed Notice that will be recorded upon completion of the remedial action. This comprises recording of a deed notice by the county recording officer, and proof of consent by the property owner. A draft deed notice is included in this RAWP Addendum updated to be consistent with the most current guidelines.

- Notification to the municipality,

- Narratives describing the institutional and engineering controls and the monitoring and maintenance activities for the controls. The list of restrictions is maintained on-site to be available for inspection.

The current property owner and the current business operator will both maintain the integrity of the remedial remedy in order to protect human health and the environment from unacceptable risks.

3.0 PRE-CONSTRUCTION ACTIVITIES

3.1 Platty Kill Pond Pipeline Closure

The following section describes the procedure and methods used in the abandonment/closure of the inactive sewers terminating in the PKP.

Inactive sewers were identified around the perimeter of and entering the PKP. BI excavated near the outer perimeter of the bulkhead to expose and confirm the locations of these pipelines. Upon exposing the pipelines, BI cut and inspected the pipeline contents to determine if the materials in the sewers were of sufficient quantity to require removal, and if the contents were significantly different from the sediments in the PKP. Since the sewers were historically the means of conveyance for the existing PKP sludge, it was determined that the sediments and liquids in the sewers were the same general material that has collected in the PKP. It was field determined by BI personnel that the materials in the pipeline needed no further characterization or analyses.

BI personnel determined that the material contained in the sewers was not of a quantity that would necessitate removal. The sewers were then sealed at locations outside the bulkhead wall using a concrete-slurry poured into the pipes. Portions of the sewers protruding through the bulkhead were left in place due to the condition of the bulkhead and its lack of structural stability. Removal of sewer sections penetrating the bulkhead would undermine its structural integrity.

Sewer sections on the waterside of the existing bulkhead can be left in place, since they will not interfere with construction operations. These sections are located in the same area as the tiebacks and structural members for the bulkhead and would therefore be left undisturbed. Any of the remaining sewer sections that are determined to be in the way of the sheet pile installation are to be removed as part of that installation program. Any free oil migrating from the pipe stubs will be addressed by the sumps and perimeter drain called for in the containment design. Ultimately, the existing wooden bulkhead, tiebacks, and abandoned pipe stubs would become debris/fill outside of the controlled containment.

With the external sewers sealed, the proposed perimeter drain and sumps will collect any inward migration of pre-existing materials outside the perimeter of the PKP containment wall. The interior of the PKP will exist as an isolated unit, and the origin of the historic inactive (sealed) pipelines will be addressed as part of the overall site-wide Remedial Investigation process.

3.1.1 Stormwater Discharge

In January 2003, it was believed that all of the pipelines leading into the PKP had been sealed. On January 14, 2003 at approximately 11:30 AM, storm water was observed discharging through an overflow pipe from the PKP into the Platty Kill Canal (PKC). This incident was communicated to the NJDEP Hotline and assigned Case Number 03-01-14-131823.

The high level in the PKP was originally believed to be due to a faulty plug in a storm sewer line that allowed storm water to be diverted from the wastewater treatment plant to the PKP. All pipes penetrating the PKP bulkhead were examined from the perimeter upon discovery of the storm water discharge. The examination indicated storm water was flowing into the PKP through a 30-inch diameter sewer pipe.

A review of historical drawings indicated that the 30-inch diameter sewer pipe was previously severed and plugged, and the sewer redirected to the wastewater treatment plant. The plug was verified from grade. An excavation of the area was performed and the point at which the sewer was severed was also verified from grade. It could not be determined how storm water was entering the 30-inch diameter pipe after two days of field excavation.

The elevation of the overflow pipe was unintentionally lowered as a result of various field investigations conducted at the PKP. These field investigations were

conducted in association with preparations for closing the PKP. Stormwater entering the PKP via the 30-inch sewer pipe increased the level in the PKP thereby causing the water level to rise.

By 2:30 PM, the overflow pipe was raised above the PKP water level and the 30-inch sewer pipe was plugged with a plug as a temporary measure. There were no subsequent discharges via the overflow pipe. The overflow pipe was removed during the installation of the sheet pile wall in the summer of 2003.

Plant personnel sampled the storm water discharging through the overflow pipe into the PKC. The grab sample results indicate low levels of contaminants. The analytical results are provided in Appendix B.

A dye study initiated by BI on January 15, 2003 confirmed the visual examination of the previous day, which indicated that the 30-inch diameter pipe was discharging storm water into the PKP. The source of the storm water was identified and a plan developed to reseal the 30-inch diameter sewer pipe.

During a subsequent investigation, clean out and repair of the sewer system, an unknown cross connection between an active and inactive sewer system was identified. The point of the cross connection was down stream of the point at which the historical drawings indicated that the sewer was severed. The necessary repairs were made to the sewer and the 30-inch sewer line to the PKP was plugged.

The completion of the proposed remedial action from the PKP will eliminate potential further discharges from the PKP to the PKC.

3.2 Final Pond Material Stabilization Reagent Mixture & Design

O'Brien & Gere Laboratories, Inc. (OBG) performed bench scale treatability testing. A summary of the treatability testing is provided below and the complete OBG report is provided as Appendix C.

Samples of the sludge were collected from the bottom of the PKP and submitted to OBG for stabilization/fixation treatability testing. The goals of the treatability study were to evaluate various solidification agents and develop a mixture capable of stabilizing the PKP sludge. Specifically, the treatment must include the following to allow for in place closure:

1) Complete solidification of free product which may exist in the sludge,
2) Deactivation of potential reactive sulfides,
3) Solidification to a minimum unconfined compressive strength of 25 psi, and
4) A permeability of 1×10^{-6} cm/sec.

3.2.1 Testing Procedures

On October 25, 2002, three sludge samples were collected from the PKP using a vibracore sampler and submitted to OBG for testing. In addition, soil samples collected from the Stockpile A soil pile. As part of the NJDEP approved Soil Re-Use plan, Stockpile A soil will be added to the PKP sludge to aid in the stabilization process. Therefore, the testing performed was done using a simulated mixture that will be used in the field.

3.2.2 PKP Sludge Composites

Based on visual observations, the most oily/impacted PKP sludge samples were selected for the treatability testing. Three composite samples were collected representing the "worst-case" overall sludge quality in the PKP that would be encountered. In addition, a grab sample of the most visibly contaminated sludge was evaluated separately to represent potential problem areas that may require greater Portland cement quantities.

For the PKP sludge composite samples, a mix of 15% Type III Portland cement by weight, 15% stockpile A soil by weight, and 5% attapulgite clay provides a stabilized product that has a density of approximately 56 pounds per square inch (psi) after 3 days

of curing. Further testing showed a 92 psi after 7 days and a 176 psi after 21 days. Laboratory strength and permeability testing show that acceptable stabilization results are achieved using 10% Type III Portland cement, 15% stockpiled soil, and 2% attapulgite clay. However, to assure a successful remedial effort, the selected mixture will be increased to 15% Type III Portland cement (15:15:2).

3.2.3 Findings

Based on the results of the treatability testing, the PKP sludge can be treated with the addition of Portland cement, Stockpile A soils, and attapulgite clay. This mixture can be used for the complete solidification of sludge and free product present in PKP. The mixture resulted in a treated sludge mass with no free liquids that has a minimum unconfined compressive strength of 176 psi after 21 days to allow for in-place closure. Additionally, the treatment resulted in the passing of TCLP characterization samples and achieving a permeability of at least 10^{-5}.

3.3 Clay Investigation

In response to the NJDEP's concerns regarding the suitability of the underlying clay for producing a competent seal with the driven sheet piling, soil borings were conducted around the PKP. The purpose of the soil borings was to confirm a clay bottom appropriate for the proposed closure approach. As required by the NJDEP's conditional approval letter of May 18, 2001 and as discussed at our subsequent meeting in Trenton, the required soil borings were completed in May 2002. A copy of the July 9, 2002 correspondence is provided in Appendix A and a summary of the results is presented below.

The NJDEP case geologist and a Bluestone Environmental geologist conducted the field investigation jointly. The clay was field evaluated using plasticity tests detailed in the Bermeister Soil Classification System. This field evaluation indicated that the clay exhibits sufficient plasticity to provide for a rebound of the clay to the driven barrier wall.

Three soil borings intersected an underlying hardpan or gravel-till layer below the clay-till

layer. Field evaluation of the properties of this underlying material, indicate that it has a low permeability and provides a good foundation for the low-permeability clay bottom used as part of the closure.

Boring logs for all six of the soil borings installed around the PKP are included in the July 9, 2002 letter report which is provided in Appendix A. Soil boring SB-2R is the initial attempt for soil boring SB-2 location and was abandoned and grouted to the surface after penetrating to 20 feet below ground surface.

Included in July 9, 2002 letter report (see Appendix A) are the locations of the soil borings, piezometers, and generalized soil classification cross-sections. Cross Section A-A'-A'' is the west to east generalized soil classification cross-section across Platty Kill Pond and a portion of the Platty Kill Canal. The recently installed soil borings Y9-PKP-SB2, SB-2R, and SB4 are included along with soil borings and vibra-core sample data obtained previously.

Cross Section B-B' is the north to south generalized soil classification cross section across Platty Kill Pond and includes recently installed soil borings Y9-PKP-SB1 and SB3 along with soil borings and vibra-core samples previously obtained.

3.4 Vertical Ground Water Gradient

Vertical ground water gradient was addressed through the installation and use of piezometers near the PKP. A detailed comparison was made of the water levels above and below the clay – till, and tidal fluctuation in the PKC, confirming an upward vertical flow. Details of the piezometers installation and ground water gradient analyses (as included in the July 9th , 2002 letter report) follow:

In two borings on the south side of the PKP, two piezometers were installed side by side (nested pair) to measure the vertical gradient (pressure head differential) directly above and below the reddish-brown clay-till.

The piezometers are constructed of a five-foot length of one-inch inside diameter PVC, 10-slot screen, and completed with a sealed solid riser to the surface. The 5-foot screened interval for the shallow piezometer (PZ-OVB) was installed just above the clay-till in the overburden sand material. The deeper piezometer (PZ-TILL) was installed inside steel casing sealing the lower clay-till from the overburden and in the gravel-till found just below the clay-till. Both piezometers were installed inside of steel casing that was installed to the upper gray clay/meadow mat layer. The piezometer screen intervals are depicted relative to the clay on Figures 2 and 3, and the Piezometer construction logs are provided in Attachment A of the July 9, 2002 letter report (Appendix A).

These piezometers and a staff gage (SG-1) installed in the canal were used to gain pertinent tidal fluctuations. Borbas Surveying and Mapping L.L.C. of Boonton, New Jersey surveyed these points for both X-Y location and the PVC top of casing elevation above mean sea level. In addition, Borbas also surveyed the X-Y location and ground surface elevations for all soil borings. Automatic data loggers (Solinst Levelogger®) were used to simultaneously compare the water levels in the piezometers installed above and below the clay-till to each other and to the water level tidal fluctuation in the Platty Kill Canal (SG-1). The graphical results of the measurements are shown on Figures 4 and 5 of the July 9, 2002 letter report. All measurements have been normalized to mean sea level using the elevations derived by the Borbas survey. As depicted in Figure 4, the elevation of the hydraulic piezometric surface in the deeper piezometer (PZ-TILL) under the clay is always higher than the piezometric surface above the clay-till (PZ-OVB). This confirms that the vertical flow is upward through the clay-till and that the tide is not reversing the ground water gradient adjacent to the PKP.

The NJDEP indicated its concurrence with the containment wall approach and supporting data referenced above, providing that BI is able to demonstrate the effectiveness of the method over time. This will be the focus of the External Monitoring of Outmigration and Inmigration, and will include the specific tasks and associated schedule as outlined in the Biennial Certification/Monitoring Plan.

4.0 REMEDIAL ACTION METHODOLOGY

As per the NJDEP's conditions for approval of the sheet pile remediation strategy, BI has finalized the necessary design work.

4.1 Final Cap Design

In response to the NJDEP's May 18, 2001 letter asking for complete information regarding the design specifics of the proposed cap, the engineering design plans are completed and are provided below.

The proposed impermeable cap for the PKP will consist of a three-component composite layer cap, which, combined is a 2-foot vertical cap.

The three component cap layers, from top to bottom, will consist of an 18-inch vegetated top cover layer, geosynthetic impermeable liner, and a 6-inch bedding layer. Details of the proposed impermeable cap are provided in Figures 1 and 2.

4.1.1 Vegetated Top Cover Layer

An 18-inch vegetated top cover and erosion control blanket will be constructed to maintain vegetative growth over the PKP. The vegetated top cover layer with an erosion control blanket will be installed to minimize erosion without the need for contingency application of fertilizers, irrigation, or other non-applied materials to ensure viability and persistence. However, fertilizers, water and other materials will be applied during the capping construction or post-closure period, if necessary, to establish vegetation or to repair damage.

The vegetated top cover layer will be planted with persistent species that will effectively minimize erosion, and that do not have a root system that will penetrate

beyond the vegetative and drainage layer. A recommended seed mixture has been submitted as part of the Soil Erosion and Sediment Control Plan and is pending approval by the Hudson-Essex-Passaic Soil Conservation District.

The final top slope will be, at a minimum, between three and five percent (i.e., 0.03 ft/ft and 0.05 ft/ft) after allowing for settling and subsidence, and a maximum slope of 33 percent (i.e., 3 Horizontal: 1 Vertical) in the trench drain area. For the slopes exceeding five (5) percent, the maximum erosion rate shall not exceed 2.0 tons/acre per year using the USDA Universal Soil Loss Equation (USLE).

The vegetated top cover will contain a surface drainage system capable of collecting rainfall runoff across the cap without forming erosion rifts and gullies.

4.1.2 Geosynthetic Impermeable Liner

After filling and fixing the material in the PKP, the pond will be covered with a Claymax Geosynthetic Clay Liner. The liner consists of a half-inch layer of high swelling Sodium Bentonite Clay sandwiched between two woven High Density Polypropylene (HDPP) textile fabrics. The Bentonite clay is impermeable and has an inherent ability to naturally heal itself from small tears or punctures by swelling to fill the void. A steep slope form of Claymax liner will be used where the two polypropylene textile covers are stitch-bonded together with high strength polypropylene thread to provide a very high internal shear resistance that allows use on slopes as step as 1H:1V, or where deeper cover is used.

The rolls of Claymax liner will be overlapped by a minimum of six-inches (6") along the edges and twenty-four-inches (24") along butt seams in accordance with the manufacturer's recommendation. The edges of the Claymax liner will extend over the sheet pile walls and be anchored in the perimeter drains surrounding the PKP thus forming an impermeable cover. Stormwater that runs off the PKP ground cover will collect in the perimeter drains and be pumped to the existing wastewater treatment

system.

The manufacturer recommends a minimum of eight-inches (8") of free draining soil cover to protect the Claymax liner from mechanical damage and to prevent it from dehydrating. The Hudson-Essex-Passaic Soil Conservation District, Application Number 203-H-1833, has required a minimum of twenty-four-inches (24") of soil suitable for growing a grass cover. Shallow root grass shall be planted. As part of the maintenance program the ground cover shall be treated annually with weed killer to prevent the growth of deep rooted vegetation that can penetrate the Claymax linear.

4.1.3 Sand Bedding Layer

Installed directly beneath the GCL will be a 6-inch sand bedding layer. The bedding layer will be located above the treated mix layer. The bedding layer will be free of organic material and consist of a sand material.

4.1.4 Capping Subgrade Preparation

Prior to installation of the proposed cap, the PKP will be graded and compacted to 2½ feet below the proposed final contours. The subgrade will be graded to a minimum slope of five percent and a maximum slope of 33 percent.

4.2 Containment Sheet Pile Wall Installation

As per the NJDEP's conditions for approval of the internal sheet pile option (NJDEP Conditional Approval, May 18, 2001), BI has finalized the necessary design work. Currently, the sheet pile is being installed around the PKP; as-built dimensions of the sheet pile are provided in Figure 3.

The sheet pile containment walls are made up of 45-foot long sections driven approximately three to four feet inward from the existing wood bulkhead depending upon the bulkhead

condition. These sections were installed under contract by Neuber Environmental Services, Inc. to grade using a vibratory pile driver. Where practical, the sheets were welded into pairs prior to being driven in order to reduce the number of ball and socket seams that had to be sealed. The remaining seams were sealed by use of ADEKA Ultra Seal A-30 water stop for steel sheet pile interlocks, a water swelling sealing material that is applied to both the sheet pile ball and socket prior to being driven.

The eastern metal sheet pile wall along the earthen dam between the PKP and PKC was shifted westward approximately five feet at the south end, and ten feet at the north end, in order to avoid obstructions within the earthen dam and interference from above ground pipelines. One of the 45-foot long metal sheet piles in this area, the seventeenth from the north end, was driven to only thirty-five-foot eleven-inches (35'-11") before refusal in the till layer underlying the clay.

The sheet piling in the northwest corner was also shifted because of obstructions from the 68-inch sewer that was in this area. A single and a double width sheet pile in this area were only driven to thirty-six-foot two-inches (36'-2") and thirty-six-foot eleven-and-a-half inches (36'-11.5") before refusal. These are also refusals into the till layer.

During the pile driving process some of the sealing material was observed to be removed. Subsequently the pond level was observed to fall and rise with the level of water in the perimeter drain surrounding the PKP. As soon as weather conditions permit, the pond water level will be pumped down and new sealing material will be applied by the contractor to all seems above the mud line.

The new metal sheet piling was originally going to be driven through the existing wood bulkhead to seal the perimeter drain against the ebb and flow of the tide in the PKC. However, based on the deteriorated condition of the wood bulkhead this was not done for fear of collapsing the wood bulkhead. This left the perimeter drain open to some influence of the tide changes in the PKC. Bayonne Industries has already submitted a RASR for the closure of the PKC that incorporates sheet pile containment walls that will be anchored against the sheet piling around the PKP.

Anchoring points for this have already been constructed. No further action will be taken as it is believed that the closure of the PKC will solve this problem.

Several of the old sewers that entered the PKP were sealed prior to the erection of the sheet pile containment walls. Siltation in some of the sewers in the area caused stormwater to back up through the sealed sewers to open sewer gratings and flow overland into the PKP perimeter drains. The sewers were cleaned and a temporary earthen dike was erected to divert this stormwater from the perimeter drains to the existing wastewater treatment plant. The area will be graded in the future to prevent this from reoccurring.

4.2.1 Pond Bulkhead Sensitivity Analysis

An engineering evaluation (sensitivity analysis) was conducted by Ocean and Coastal Consultants, Inc. (OCC) of Trumbull, Connecticut to determine the depth of the excavation without causing the bulkhead to collapse. The results of the OCC evaluation have shown that excavation beyond a depth of 17 feet below land surface would undermine the existing structures and risk collapse. The sensitivity analysis is provided below.

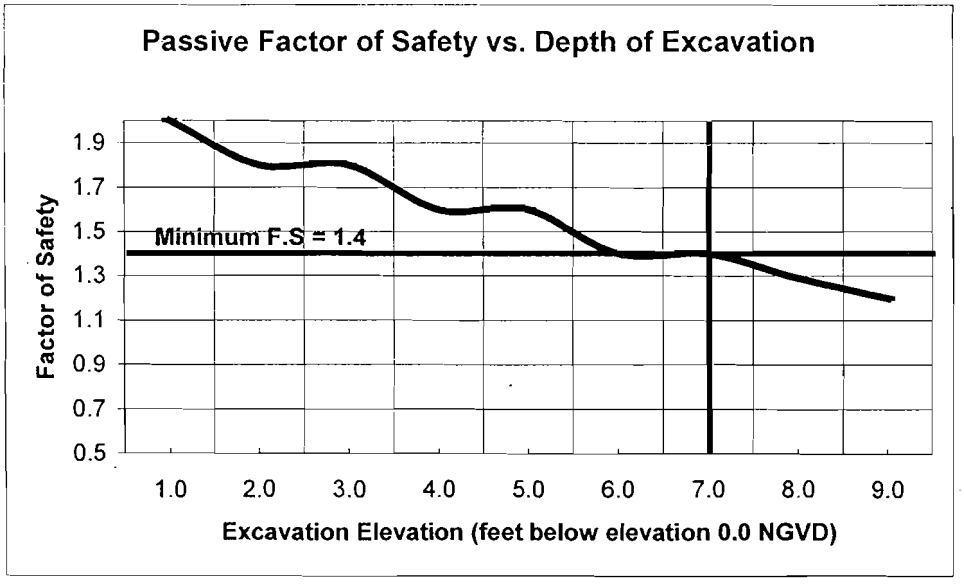
The structural stability of the existing timber bulkheads is a critical component of the remedial actions to be taken in the PKP. The existing timber structures are at least 25 to 35 years old, and must remain stable during construction of the new sheet pile containment system. While attempting to remove as much impacted material between the new and old bulkheads, a sensitivity analysis was performed to determine the safe depth of excavation.

The sensitivity analysis involved examining a range of excavation depths and then determining the resulting factor of safety against passive soil failure along the toe of the timber bulkheads. While there may be other failure modes such as bending or shear along the timber sheets, a soil failure at the toe of the sheet piles was examined as the primary failure mode. Using classical methods of active and passive earth pressure, a number of

analyses were performed which modeled successive excavation depths. The depth of excavation was gradually increased and a factor of safety against a passive soil pressure failure was generated for each.

Sheet pile bulkheads are flexible wall systems that deform and by doing so engage passive resistance of the surrounding soil. Passive earth pressures are those which develop below the surface and are those which are generated by the lateral forces of the sheet pile toe as it tries to deform outward. As the depth of excavation increases, the lateral force at the toe of the sheet pile increases.

The following chart shows a desired minimum passive safety factor of 1.4, which occurs between elevations -6.0 and -7.0 feet NGVD. As the attached chart indicates, the factor of safety drops steadily as excavation proceeds below this point. Therefore, the maximum depth of excavation that has been prescribed on the construction drawings and specifications is elevation -7.0 feet NGVD. The sensitivity analysis shows that removal of material to a lower depth will negatively impact the structural stability of the existing bulkhead.



4.2.2 Wall Friction

Wall friction was addressed in the NJDEP July 9, 2002 correspondence provided in Appendix A), and as stated in the letter, it is expected that there will be a significant amount of shear strength between the sheet pile and the clay resulting in a high value of wall adhesion, greatly inhibiting migration of contaminants along the soil/steel interface. The details of the response follow.

The proposed remedial action at the PKP involves the use of a driven steel sheet pile cantilevered wall system. This wall system must support approximately 12 feet of retained earth pressure as well as hydrostatic pressures. The cantilevered sheet pile forms a perimeter barrier as well, containing the pond sediments so that the fixation process can be performed. Based on soil strength characteristics, the cantilevered wall must be driven through the confining clay-till layer below and into the glacial till for structural stability.

The following mitigating factors are presented which will substantially limit the concerns that the steel sheet pile wall would act as a conduit to vertical ground water migration. This information is provided purely from a soil/structure interaction perspective and assumes a downward gradient exists in the PKP, which is not the case.

Wall friction or adhesion occurs between various foundation materials and the surrounding soils. Empirical values for wall friction are generally used for flexible walls such as sheet piling designed with the Coulomb coefficient method. In the case of the PKP, the Coulomb method was used, and the flexible cantilever wall system allows for deformation to occur.

For a steel sheet pile bulkhead, wall friction develops between the sheet pile and the surrounding soil and its magnitude is estimated as a function of the soil strength properties. The result of wall friction is to reduce earth pressures acting on the wall. For cohesionless soils, the value of wall friction is taken as 0.6 to 0.8 times the angle of internal friction.

In cohesive soils, wall adhesion develops between the sheet pile and the soil and is a function of the cohesive strength of the soil. The value of adhesion varies from 0.5 to 0.7 times the unconfined shear strength of the clay. In this case, triaxial shear tests show the undrained shear strength as being approximately 1,800 psf. Therefore, the value of wall adhesion ranges between 900 to 1,260 psf. While this is only an estimate based on empirical data, there is a significant amount of shear strength between the sheet pile and the clay based on wall adhesion. This adhesion would greatly inhibit migration of contaminants along the soil/steel interface.

In addition to the pressure of adhesion between the clay and the sheet pile, there is the process of sheet pile driving that must also be considered as limiting any potential migration. The piles will be installed utilizing a vibratory type of hammer, which is extremely common for most sheet pile projects.

A vibratory hammer exerts a vertical vibration in the pile, which disturbs or "liquefies" the soil along the immediate boundary. The pile moves downward under its own weight, plus the weight of the vibratory hammer. In clay soils, the hammer shears the soil from pile adhesion and allows the pile to move downward. It is believed that the vibratory process of driving sheet pile into the clay will mobilize and liquefy the sediments that are in direct contact with the sheet pile, and allow for wall friction through adhesion to immediately develop when pile driving is completed.

4.3 Water Management Program

The following sections address the potential for the accumulation of water that may affect the stabilized material during and after the PKP closure.

4.3.1 NJPDES Permit

In response to NJDEP's May 18, 2001 letter addressing BI's NJPDES permit

application, the following section describes the proposed methods and processes for managing water associated with the closure of the PKP. The NJDEP's response to BI's Consistency Determination letter dated October 25, 2002 regarding renewal of NJPDES Permit Number NJ0002089 is scheduled to be issued on March 31, 2003. The final permit is included as Appendix D.

Management of closure related wastewater would include existing standing surface water within the PKP, and groundwater beneath and surrounding the impoundment. All water recovered prior to and during construction, and as an ongoing program targeting groundwater will be transferred to the Westside Wastewater Treatment Plant for processing before being discharged at Outfall 002.

Precipitation is expected to be the only source of water that may collect in the pond during the construction period. Water accumulation from precipitation within the PKP between the time of field stabilization and installation of the cap (a proposed period of six months) will be removed in the same manner as the existing standing water, and transferred to the Westside Wastewater Treatment Plant. Keeping the interior of the impoundment free of standing water during this time period will prevent any negative impacts associated with the mixing of storm water with the fixated sludge and any other material ultimately used for filling the pond to grade.

4.3.2 Perimeter Drain System

The installation of the steel sheet pile waterside of the PKP wooden bulkhead will include the construction of a perimeter drain. The perimeter drain system will serve several purposes including the following:

(1) Recover free and residual product around the PKP.
(2) Prevent the inward migration of any contaminants into the former pond that could potentially re-contaminate the stabilized and fixated sludge and any other material ultimately used for filling the pond to grade.

(3) Recover and outward migration of any contaminants from the former pond.

When operational, the perimeter drain will act as a recovery control system that will control any product from the underlying residual material left above the clay. In addition, the system will act as an additional perimeter control by recovering any liquids existing in the surrounding subsurface outside the impoundment that might otherwise migrate toward and rest against the sheet pile barrier.

The perimeter system will be in the annular space between the sheet pile and the bulkhead. This area will be backfilled with 6-inch Rip Rap stone. The perimeter drain will be installed continuously around the north, south and west sides of the barrier. A schematic detail for this perimeter drain is shown on Figures 2 and 4.

Nine recovery sumps will be installed in a perimeter configuration around the pond. Recovery sumps will be installed in the two western corners of the pond and at interim points of the north, west, and south walls.

The sumps will be linked with perforated PVC drainpipe to create a perimeter drain type configuration around the landsides of the pond. The upright recovery wells (sumps) will be screened across the high mean water level through the low mean water level, with additional screen to account for extremes in water level fluctuation. The connecting laterals will be set across the low mean water level.

Pneumatically operated top loading total fluids pumps have been selected to collect any accumulating free product. Product entrained or dissolved in ground water will be transferred into an oil-water separator and ultimately pumped to the facility's treatment plant for treatment and discharge under the existing NJPDES permit.

These details were submitted in the Technical Memorandum dated June 26, 2001, and were deemed conditionally acceptable in the NJDEP's March 7, 2002 letter, and

approved by the NJDEP's letter of Clarification dated September 13, 2002. Copies of these correspondences are provided in Appendix A.

4.3.3 Water Management

Once the sheet pile installation is complete and the perimeter drain and sump(s) are installed, product control will be established along the perimeter of the pond. It will then be possible to isolate and remove the standing water from the impoundment and to control groundwater beneath and surrounding the outer wall of the sheet pile. Treatment of the impounded storm water will be at a controlled rate and will not result in an increase in the average discharge rate at the outfall. The most recent analysis of the impounded storm water is summarized in the following table (showing only compounds exceeding NJ Groundwater Criteria – Interim Specific Criteria, 8/96).

PLATTY KILL POND CLOSURE

SURFACE WATER AND GROUND WATER SAMPLING RESULTS

October 1, 2002

Compound/Parameter	Pond Surf.[a]	PZOVB[b]	MW-38[c]
Arsenic	21.9	1,330	11.1
Benzene	2.9	4.3	1.7
Chlorobenzene	<RL	143	<RL
Hardness Total	340	3,140	430
Iron Total	1,440	3,190	32,400
Iron Dissolved	<RL	NA	7,240
Lead	12.2	<RL	<RL
Manganese	77.0	11,400	423
Trichloroethene	2.0	ND	ND

Notes:
- Results reported in micrograms per liter or parts per billion (ppb).
- <RL = Compound detected at concentration below Regulatory Limit (NJ Groundwater Criteria, Interim Specific Criteria – N.J.A.C. 7:9-6, 8/96)
- ND = Not Detected
- NA = Not Analyzed

[a] Indicates sample results collected from the surface water in the Pond.
[b] Indicates grab sample from a shallow piezometer adjacent to the Pond.
[c] Indicates ground water grab sample collected from under the product layer in Monitoring Well MW-38.

Any product entrained or dissolved in ground water will be transferred into an oil-water separator and ultimately pumped to the facility's treatment plant for treatment and discharge under the existing NJPDES permit. A schematic of the proposed layout for the oil/water separator is provided in Figure 5.

5.0 REMEDIATION PERFORMANCE VERIFICATION

5.1 Stabilization Verification Sampling Plan

Samples will be collected of the stabilized material within the PKP. It is proposed to collect 27 samples from within the pond and submit the samples for TCLP, compressive strength, permeability, total density, and water content testing. The PKP will be divided into a grid pattern comprising 9 boxes and having 3 layers, resulting in a 27-grid box pattern.

Samples will be collected from each of the 27 grid boxes and analyzed for the appropriate tests. The results will be monitored and any adjustments to the mixing will be made as deemed necessary. A complete copy of the Contractor's Construction Quality Control Plan is provided in Appendix E.

5.2 External Monitoring of Outmigration and Inmigration

In response to the NJDEP's request for details on how BI will conduct external monitoring of outmigration and inmigration, the following is proposed:

Monitoring the potential impacts of any outmigration from the PKP is going to be difficult because the surrounding groundwater contains the same constituents of concern as those being stabilized inside the pond. Therefore, an indicator parameter will be used to evaluate outmigration from the PKP. It is proposed to use pH as the indicator parameter. Since the stabilization process utilizes a large amount of cement, it is safe to assume that any leachate from this stabilized area will be affected by the chemical properties of the concrete resulting in an abnormally high pH value.

It is proposed to conduct a base line study of current pH values in proximity to the PKP prior to the start of mixing. Wells will be selected to create a database on current pH trends. The baseline study will involve collecting pH values from the perimeter drain and 2 piezometers installed for the vertical gradient evaluation for a period of 3 months prior to implementing the stabilization remedy. After the stabilization remedy is completed, these wells will be monitored monthly for pH values for one year. Thereafter, pH will be monitored on a quarterly basis.

Potential inmigration will be addressed by the perimeter drain and sump system by providing perimeter control. This perimeter drain system will essentially eliminate any potential for inward or outward migration of contaminated water. It is proposed to monitor pH values of the water collected in the perimeter drain system as part of the migration monitoring work plan.

7.0 CONSTRUCTION HEALTH AND SAFETY PLAN

BI has retained D.A. Collins Environmental Services of Mechanicville, New York to complete the remedial action of stabilization inside the PKP. D.A. Collins has prepared the Construction Health and Safety Plan that will be followed during the construction activities. A copy of the Health and Safety Plan is provided in Appendix G.

8.0 QUALITY ASSURANCE PROJECT PLAN

In a May 18, 2001 letter, the NJDEP requested additional information for the Quality Assurance Project Plan (QAPP). BI has provided a Boring Log Form, Water Level/Product Thickness Form, and a discussion of the post-stabilization soil borings/sample collection with the June 26, 2001 submittal of the Technical Memorandum (a copy is provided in Appendix A). BI has also revised the section on Test Pit Soil Sampling of the QAPP to reflect the NJDEP's comment that all test pits shall be logged in accordance with N.J.A.C 7:26E-3.6(a) 2. A revised QAPP incorporating these specific comments is included in Appendix H.

The contractor's QAPP for D.A. Collins is provided in Appendix E.

9.0 SOIL EROSION AND SEDIMENT CONTROL PLAN

In October 2003, BI submitted a Soil Erosion and Sediment Control Plan (SESCP) to the Hudson-Essex-Passaic Soil Conservation District (SCD). The SCD responded to the BI submittal with a letter of deficiencies dated October 23, 2003. BI has addressed these deficiencies and submitted a revised SESCP to the SCD on December 2, 2003. BI is currently awaiting SCD review and issuance of a permit required to perform the remedial activity of the PKP. BI will obtain the necessary permit prior to implementing the soil stabilization remedial activity of the PKP. A copy of the December 2, 2003 SESCP is provided in Appendix I.

10.0 ODOR AND DUST CONTROL PLAN

10.1 VOC, Odor and Particulate Monitoring Plan

An Air Permit Application was submitted to the NJDEP's BNSR on March 14, 2003 for the PKP Closure and the Pre-Construction Permit was approved on August 29, 2003 (PCP030001). The permit's compliance plan sets the requirements for the monitoring and record keeping of VOCs, odor, and particulates and the NJDEP's Bureau of Technical Services has also provided monitoring specifications. A copy of the permit is provided in Appendix J.

An existing meteorological station at IMTT-Bayonne's Bulk Oil Traffic office will be used to determine the location of sample sites prior to sample collection. Before a sampling event occurs, the wind direction will be used to determine the upwind directional compass reading. When the location has been confirmed, the sampling personnel will take readings at the upwind location for a period of five minutes to determine the upwind pollutant concentration. Immediately after the upwind collection period is complete the sampling personnel will collect data 180 degrees downwind on the opposite side of the remediation activities for an additional five-minute period. Upon completion of the downwind sampling event, two additional monitoring events will be taken at locations between 120 and 135 degrees and 225 and 240 degrees downwind from the upwind sampling location. Monitoring will continue for five minutes at each location. If there is no detectable wind (< 3 mph) prior to the event, air monitoring will be conducted North, South, East, and West of the remediation activities.

During each monitoring event, the pollutant concentrations will be recorded every 30 seconds and averaged to determine the events "monitoring concentration". The monitoring concentration will be recorded and used to determine compliance with the air permit limitations. The results of each monitoring event will be recorded on the following an air monitoring data sheet.

For the first two weeks of sludge stabilization activities, readings will be taken from both upwind and downwind locations after initial daily startup and once every two hours thereafter. For the remainder of the project, readings will be collected after initial daily startup and every 4

hours thereafter unless the task specific action plan has been activated.

During a monitoring event, if the maximum allowable levels are exceeded, the operator will continue readings for a period of 5 minutes, and if the levels do not decrease below the threshold the action plan will be activated. From that point, continuous readings will be recorded until allowable levels have been reached for a period of 5 minutes. Monitoring events will then follow the previously mentioned schedule.

Perimeter real-time monitoring will be carried out for VOCs and total suspended particulates simultaneously by a single field member. If site activities dictate, other members of the field team will conduct the ambient air monitoring in accordance with this work plan. However, whenever possible the same team member will conduct the monitoring in order to maintain procedural consistency.

10.2 VOC Monitoring

VOC readings will be collected using a HNU portable Photo Ionization Detector (PID). During the first week of operation, personnel will collect six five-minute summa canister samples simultaneously with the required monitoring events, in order to determine the relative accuracy of the data being collected by the PID. The samples will be analyzed for TO15. When the results are received a project specific PID response factor will be developed using comparisons between the actual PID readings taken during the monitoring events and the TO15 concentrations.

The PID will be calibrated daily before use with 100 ppm isobutylene gas. The calibration record will be maintained in the field logbook. The unit will be operated and calibrated in accordance with the manufacturers operating manual. Furthermore, the monitoring equipment will be calibrated such that the action levels described can be confidently attained.

10.3 Odor Monitoring

During the VOC sampling period, personnel will assess the downwind locations for the presence of detectible odors. If odors are detected, personnel will walk along the nearest property boundary to assess the odor strength. If personnel determine that the odors may reasonably result in citizen complaint, the VOC action plan will be activated until the odors have been sufficiently reduced.

10.4 Particulate Monitoring

Total Suspended Particulates (TSP) monitoring will be conducted using a MiniRam (or equivalent) real-time aerosol particulate monitor. The monitoring will be used to trigger the action plan if the downwind concentration is more than 30 ug/m3 above the upwind concentration. If a slurry injection methodology is utilized and particulates generated by the operation are insignificant, the monitoring will be discontinued after two weeks of operation, if the differences between the upwind and downwind readings are consistently below 30 ug/m3. The monitor will be operated and calibrated according to the manufacturers operating manual. Furthermore, the monitoring equipment will be calibrated such that the action levels described can be confidently attained.

10.5 Task Specific Actions

Total Suspended Particulates Monitoring/Action

If visible emissions are observed or the real time particulate monitoring indicates a concentration of greater than 30 ug/m^3 above the established daily background for a period of greater than 5 minutes, then the action plan to mitigate the TSP emissions from the remediation activity will need to be invoked. The proposed action plan will be to immediately cease sludge stabilization activities while a water spray is applied to the area to suppress the particulate emissions. When visible emissions are no longer present or when real time monitoring indicates that particulate

concentrations are below the action level for 10 consecutive minutes, the remediation activities will then be allowed to continue.

VOC/Odor Monitoring/Action

If, at the downwind property line, odors are detected or VOC analyzer readings of 5 ppm above background are recorded for a period of greater than 5 minutes, then the action plan to mitigate VOC/odor emissions from the remediation activity will be invoked. The proposed action plan will be to immediately cease sludge stabilization activities and, if needed, apply a vapor suppression foam blanket to the area that is causing the VOC/odor exceedance. When, at the property line, odors are no longer detected and VOC concentrations are found to be below the action level for ten minutes, the remediation activities will than be allowed to continue.

Table 1
Platty Kill Pond Closure
Air Monitoring Data Sheet

Date _____

Wind Speed[1] _____ mph

Wind Direction[1] _____ degrees

Monitoring Event Personnel _____

Stabilization Work Active ____yes / no____

Project Response Factor (multiplier)[2] _____

	Upwind Monitoring			Downwind Monitoring			Downwind Right Monitoring			Downwind Left Monitoring		
	Start Time:			Start Time:			Start Time:			Start Time:		
	Location:		degrees	Location:		degrees	Location:		degrees	Location:		degrees
Measurment	VOCs (ppm)	TSP (ug/m^3)	Detectable Odor	VOCs (ppm)	TSP (ug/m^3)	Detectable Odor	VOCs (ppm)	TSP (ug/m^3)	Detectable Odor	VOCs (ppm)	TSP (ug/m^3)	Detectable Odor
Initial			no / yes			no / yes			no / yes			no / yes
0.5 min			no / yes			no / yes			no / yes			no / yes
1 min			no / yes			no / yes			no / yes			no / yes
1.5 min			no / yes			no / yes			no / yes			no / yes
2 min			no / yes			no / yes			no / yes			no / yes
2.5 min			no / yes			no / yes			no / yes			no / yes
3 min			no / yes			no / yes			no / yes			no / yes
3.5 min			no / yes			no / yes			no / yes			no / yes
4 min			no / yes			no / yes			no / yes			no / yes
4.5 min			no / yes			no / yes			no / yes			no / yes
Final			no / yes			no / yes			no / yes			no / yes
Average												
Difference between Upwind and Downwing[3,4]												

1 - wind speed and direction will be retrieved from the Traffic Office prior to the monitoring event.

2 - the project response factor will be determined during the first week of sampling.
All VOC results must be multiplied by this factor to determine actual VOC readings.

3 - allowable VOC difference = 5 ppm

4 - allowable TSP difference = 30 ug/m^3

Comments: _____

11.0 SITE RESTORATION PLAN

Site restoration is to be conducted to the extent practicable pursuant to 7:26E-6.4(b)2. A Waterfront Development permit has been approved to fill the PKP; a copy of the permit is provided in Appendix K

The fill material used to restore the site after the remediation has been completed will be similar in nature given the fill materials to be used will be stockpiled soil obtained from other parts of the BI property. The final capping materials, grading, and vegetative cover will be conducted as described in the following sections of this report:

Remedial Action Methodology,
Soil Reuse Plan, and
Soil Erosion and Sediment Control Plan.

Site restoration will consist of a cap over the fixated material. The cap components are an 18-inch layer of topsoil with a vegetative cover, an erosion control blanket to protect the topsoil layer, and a geosynthetic liner. The final cap will have a minimum slope of 5% to promote drainage away from the containment area, and will be surrounded by a minimum 3-foot wide boarder of rip-rap which will extend beyond the underlying sheet pile containment system.

Site-specific conditions applicable to the variance are the in situ procedures used as a remedy. The sludge materials in the PKP will be fixated and stabilized to a material that is low in permeability and will not leach organic or inorganic contaminants into the surrounding groundwater. This requires the addition of add mixture materials and the additional containment around the mass using coated steel sheetpile driven into a clay bottom.

The technical basis for the variance rests on the ability of the add mixture to bind the contaminants with bench scale testing programs. The most recent test is included in this RAWP Addendum. The sheet pile barrier keyed into an underlying clay layer provides a bottom to the system. The low permeability cap provides a means of essentially eliminating infiltration to the treated sludge and the perimeter drain provides an additional mechanism for capturing inflow or outflow from the system.

12.0 MONITORING, MAINTENANCE, AND BIENNIAL CERTIFICATION

12.1 Biennial Certification

Pursuant to N.J.A.C. 7:26E-6.4(g)4., the first biennial certification is due every two years from the date the institutional control will be stamped and filed with the County Clerk. The information required for the biennial certification shall be accompanied by the certifications required in N.J.A.C. 7:26C-1.2 (a)1. The NJDEP forms that will be submitted for the biennial certification are provided in Appendix L.

12.2 Monitoring and Maintenance

BI has prepared a Monitoring, Maintenance, and Biennial Certification Plan that will be implemented upon completion of the PKP remedial actions; a copy of the plan is provided in Appendix M.

13.0 DRAFT DEED NOTICE

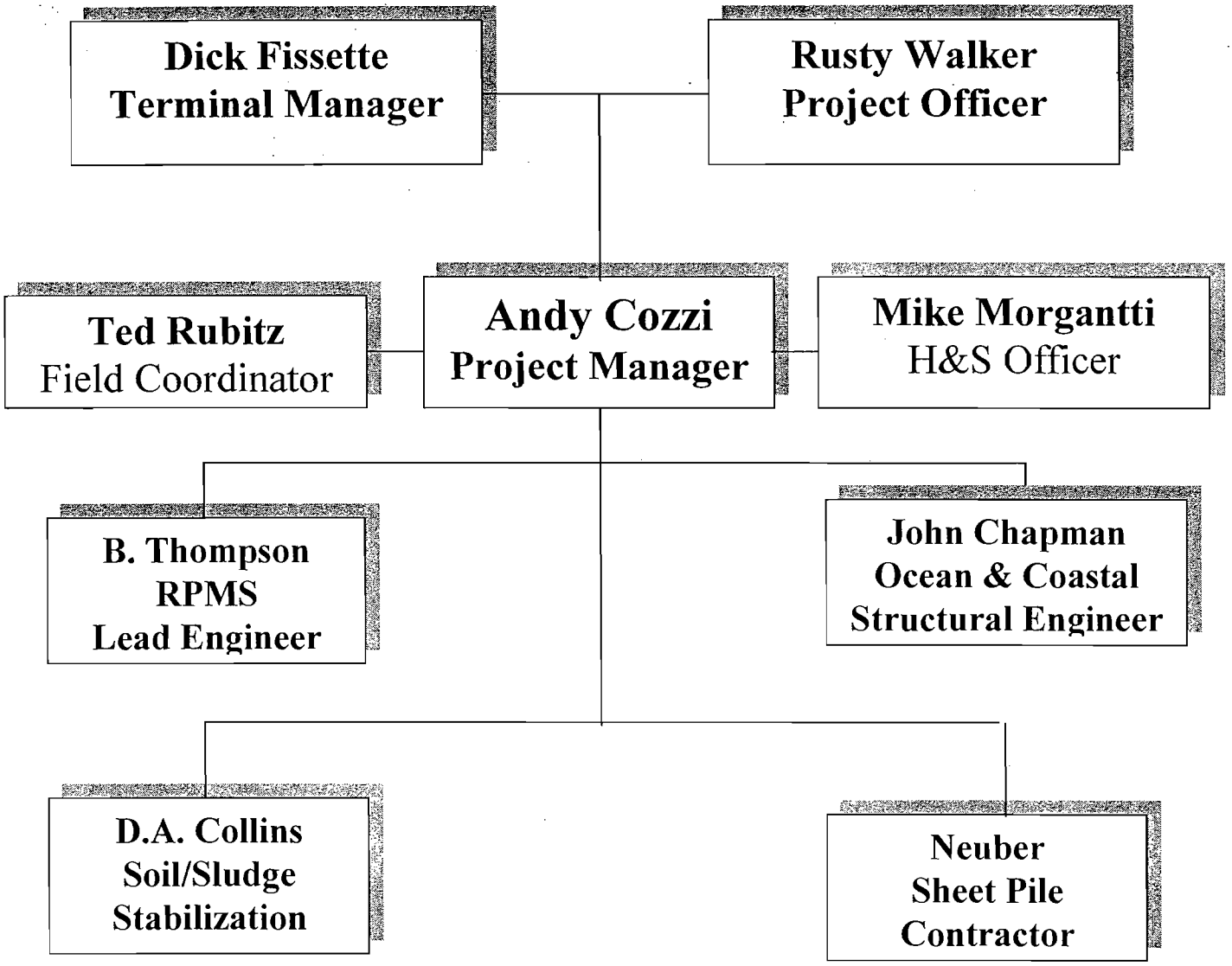
As requested, an updated draft Deed Notice is being provided to the NJDEP in Appendix N.

14.0 CLASSIFICATION EXCEPTION AREA

As per the NJDEP's comment, and as specified in BI's June 26 2001 response, a CEA is deemed premature and will be established at such time as a site-wide RAWP is approved for all or parts of the site.

15.0 PROJECT ORGANIZATION

The project organization is provided below.



16.0 PROJECT SCHEDULE

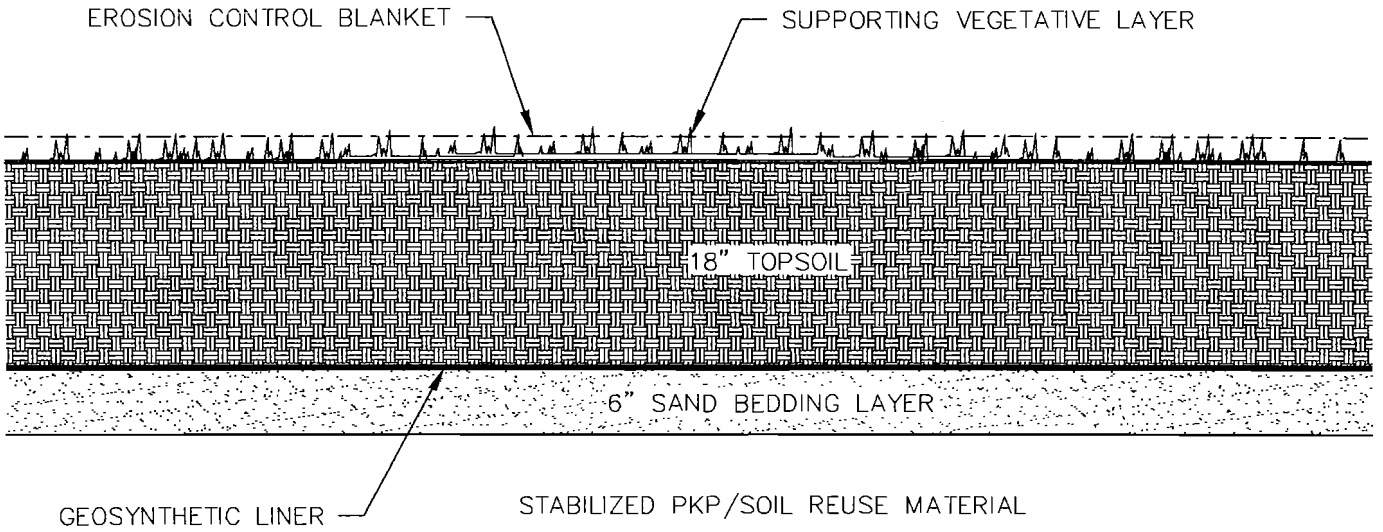
The schedule has been revised as per BI's September 25, 2002 response to NJDEP comments dated September 13, 2002. In accordance with N.J.A.C. 7:26-6.5, the following revised schedule provides a chronological description for the implementation of the remaining outstanding activities.

Progress reports will be submitted on a quarterly basis through the completion of the PKP stabilization.

PLATTY KILL POND
IMPLEMENTATION SCHEDULE
as of January 2004

YEAR	2004									
MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
TASKS										
NJDEP Review and Approval of RAWP Addendum	■	■	■							
Field Mobilization				■						
Perimeter Drain/Sump System Installation				■						
Transportation of Stockpiled Soils to Pond					■					
Mobilization of Stabilization Equipment					■					
Site Setup						■				
Field Stabilization and Sampling							■	■		
Install Fill and Cap									■	
Timber Barrier Installation										■

FIGURES



NOT TO SCALE

	POND\103003-01.DWG	03		7/25/03			
PRG. NO.	CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY

PAUL C. HUNT, JR, P.E.
N.J. P.E. LICENSE NO. 38745

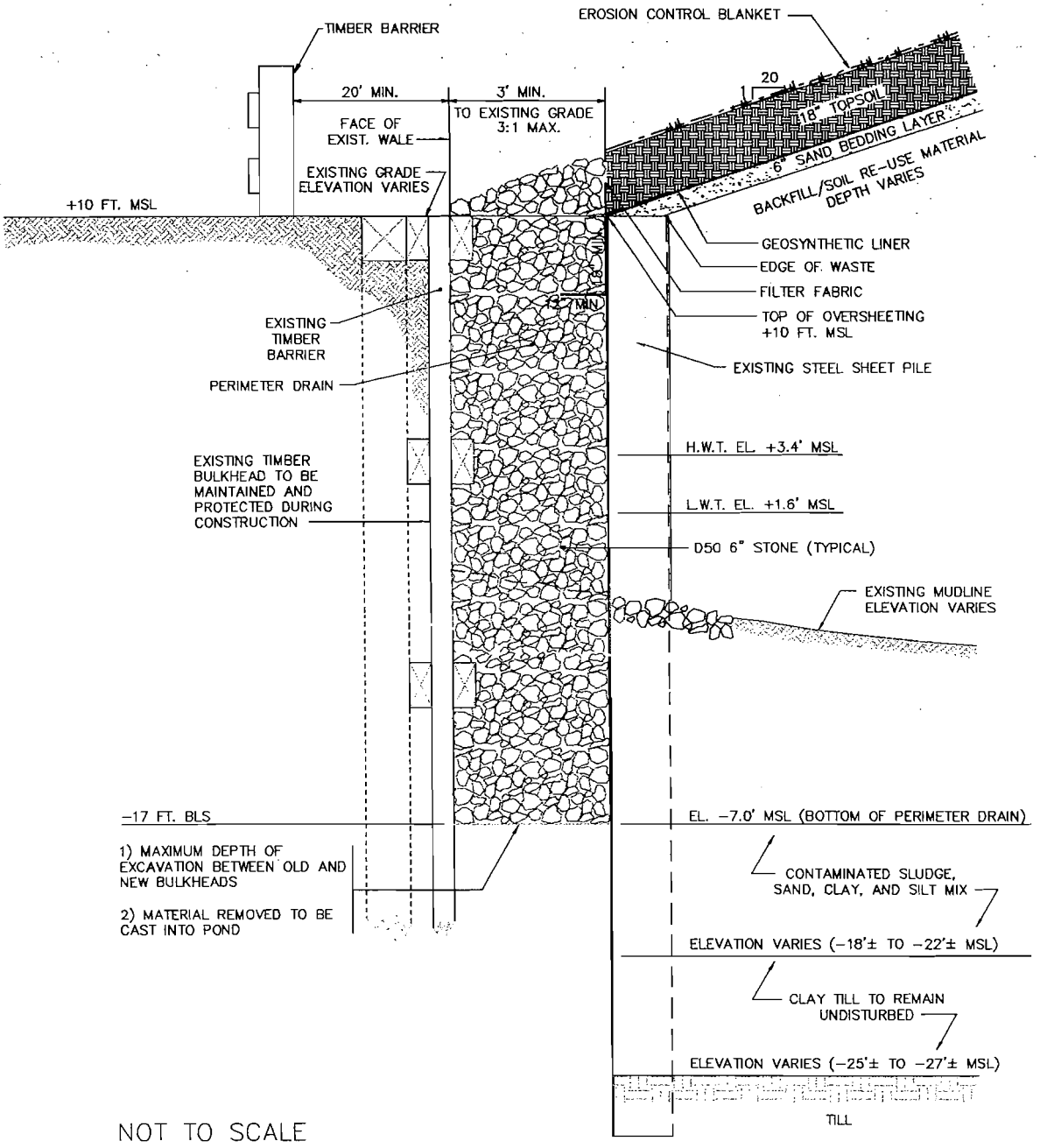
BLUESTONE ENVIRONMENTAL SERVICES, LLC
489 UNION AVE., SUITE C
BRIDGEWATER, NJ 08807

PREPARED FOR: B.I. *BAYONNE INDUSTRIES*
BAYONNE NEW JERSEY

SITE/DESCRIPTION: **FINAL CAP DETAIL**
PLATTY KILL POND CLOSURE DESIGN
BAYONNE, NEW JERSEY

1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
PCH	PCH/JRS	AMC	PCH	30OCT03	1	3



NOT TO SCALE

CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY
POND\103003-02.DWG	–		–			

BLUESTONE ENVIRONMENTAL SERVICES, LLC
489 UNION AVE., SUITE C
BRIDGEWATER, NJ 08807

PREPARED FOR: B.I. INCORPORATED — *BAYONNE INDUSTRIES*
BAYONNE NEW JERSEY

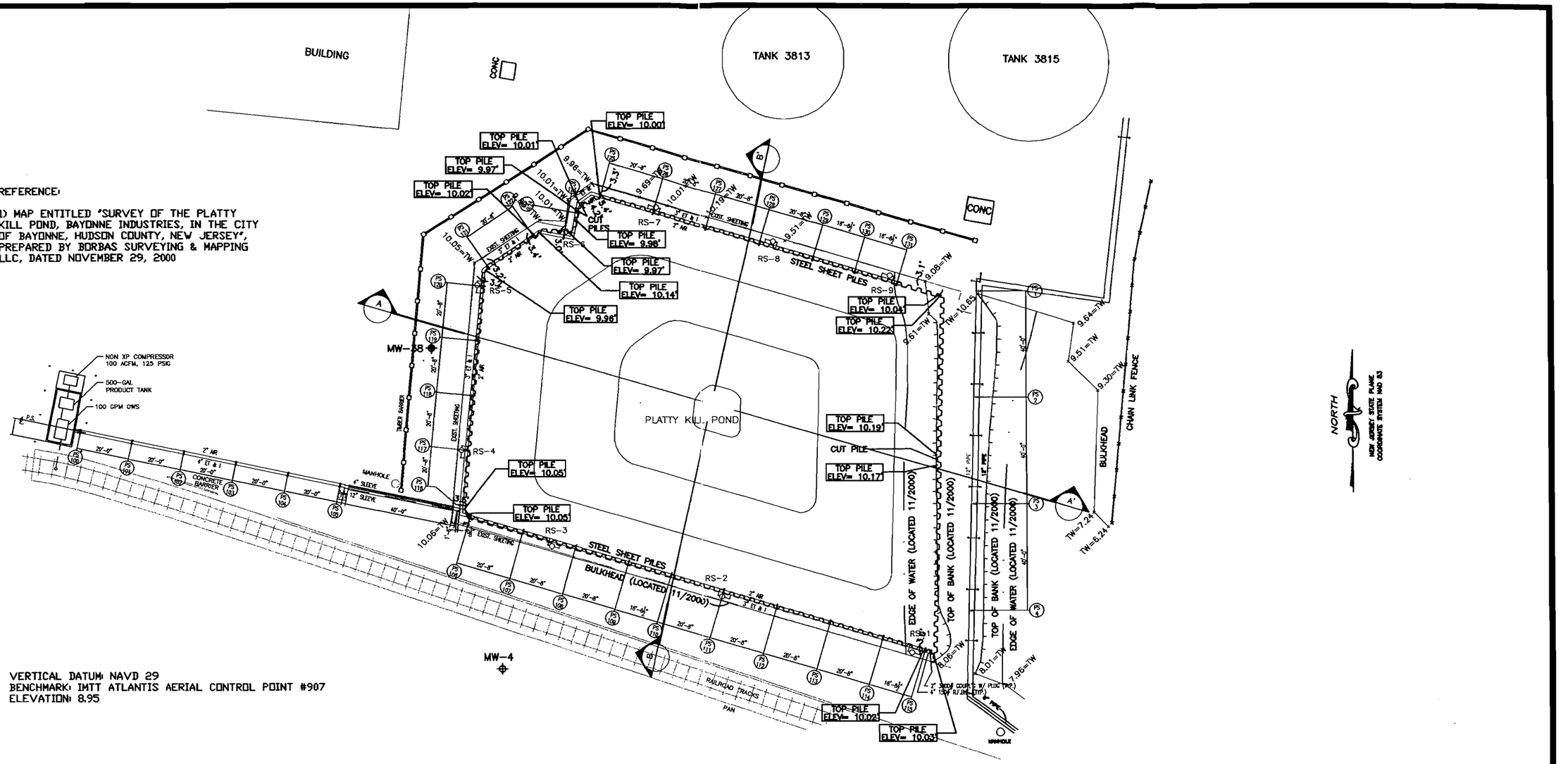
SITE/DESCRIPTION:
CAP ANCHOR DETAIL
PLATTY KILL POND CLOSURE DESIGN
BAYONNE, NEW JERSEY

2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
PCH	PCH/JRS	AMC	PCH	30OCT03	2	–

REFERENCE:

1) MAP ENTITLED "SURVEY OF THE PLATTY KILL POND, BAYONNE INDUSTRIES, IN THE CITY OF BAYONNE, HUDSON COUNTY, NEW JERSEY", PREPARED BY BORBAS SURVEYING & MAPPING LLC, DATED NOVEMBER 29, 2000



VERTICAL DATUM: NAVD 29
BENCHMARK: IMTT ATLANTIS AERIAL CONTROL POINT #907
ELEVATION: 8.95

SCALE: 1" = 40'-0"

PRG. NO.	POND\103003-03.DWG	03		7/25/03			
	CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY

PAUL C. HUNT, JR, P.E.
N.J. P.E. LICENSE NO. 38745

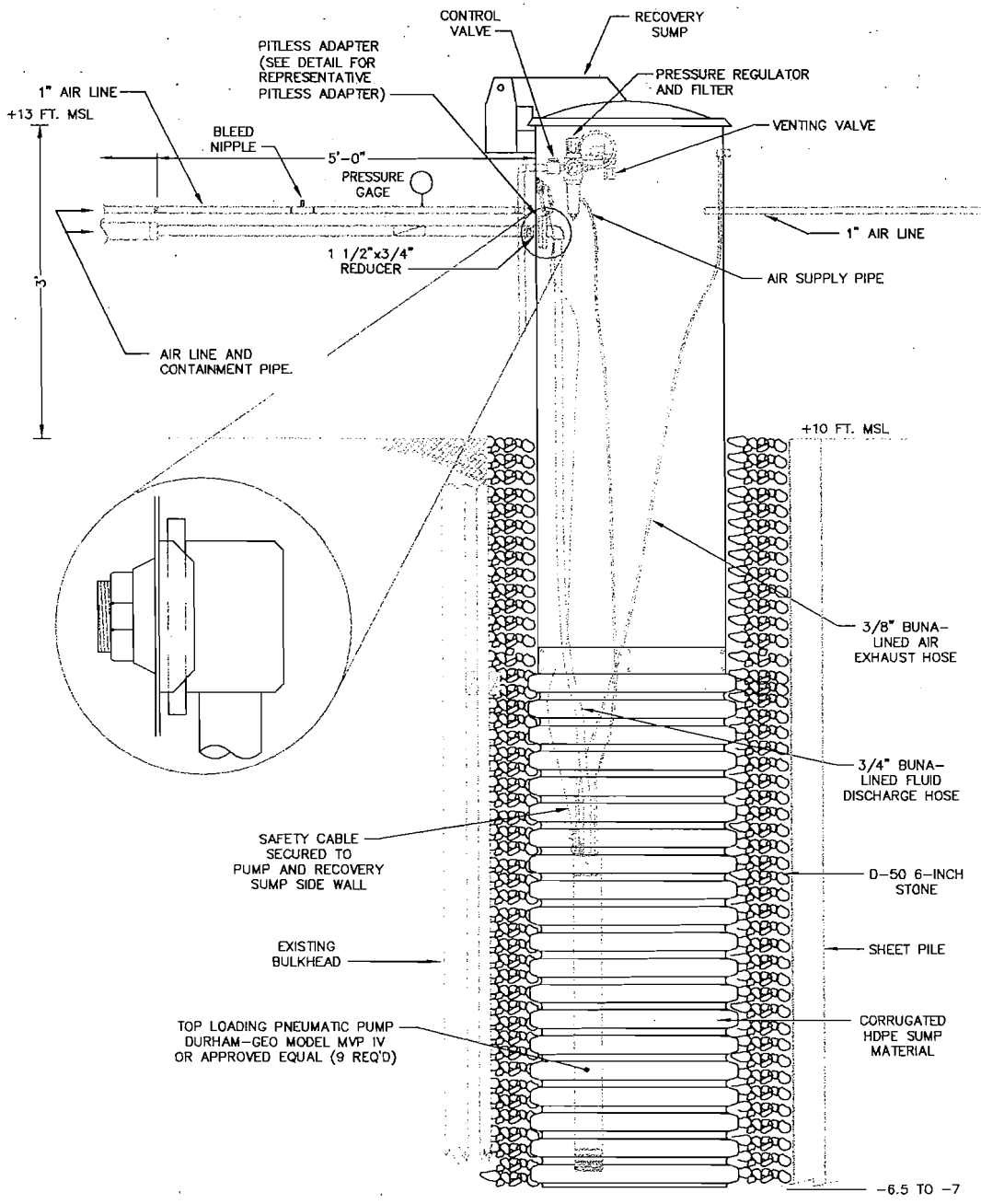
BLUESTONE ENVIRONMENTAL SERVICES, LLC
489 UNION AVE., SUITE C
BRIDGEWATER, NJ 08807

PREPARED FOR: B.I. Inc. *BAYONNE INDUSTRIES* BAYONNE NEW JERSEY

SITE/DESCRIPTION: **SHEET PILE AS-BUILT**
PLATTY KILL POND CLOSURE DESIGN
BAYONNE, NEW JERSEY

3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
PCH	PCH/RC/JRS	AMC	PCH	30OCT03	3	3



NOT TO SCALE

CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY
POND\103003-04.DWG	–		–			

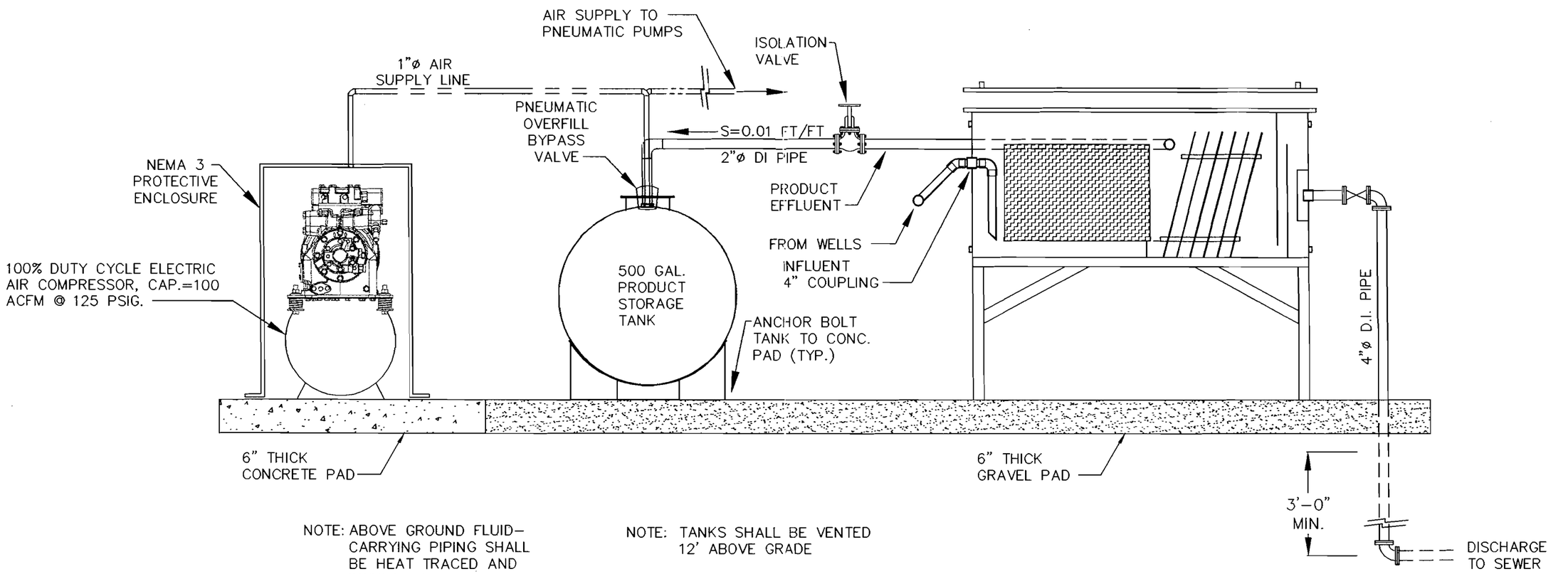
BLUESTONE ENVIRONMENTAL SERVICES, LLC
489 UNION AVE., SUITE C
BRIDGEWATER, NJ 08807

PREPARED FOR: B.I. BAYONNE INDUSTRIES
BAYONNE NEW JERSEY

SITE/DESCRIPTION: **RECOVERY SUMP DETAIL**
PLATTY KILL POND CLOSURE DESIGN
BAYONNE, NEW JERSEY

4

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
PCH	PCH/JRS	AMC	PCH	30OCT03	4	–



NOTE: ABOVE GROUND FLUID-CARRYING PIPING SHALL BE HEAT TRACED AND INSULATED

NOTE: TANKS SHALL BE VENTED 12' ABOVE GRADE

NOT TO SCALE

	POND\103003-05.DWG	03		7/25/03			
PRG. NO.	CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY

PAUL C. HUNT, JR, P.E.
N.J. P.E. LICENSE NO. 38745

BLUESTONE ENVIRONMENTAL SERVICES, LLC
489 UNION AVE., SUITE C
BRIDGEWATER, NJ 08807

PREPARED FOR: BAYONNE INDUSTRIES
BAYONNE NEW JERSEY

SITE/DESCRIPTION: OIL/WATER SEPARATOR SCHEMATIC
PLATTY KILL POND CLOSURE DESIGN
BAYONNE, NEW JERSEY

5

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
PCH	PCH/JRS	AMC	PCH	30OCT03	5	3

APPENDIX A
NJDEP AND BI CORRESPONDENCES

State of New Jersey
Department of Environmental Protection
Bureau of Case Management
P.O. Box 028
401 East State Street
Trenton, NJ 08625-0028
Telephone: (609) 633-1455
Facsimile: (609) 633-1439

DONALD T. DiFRANCESCO
Acting Governor

Robert C. Shinn, Jr.
Commissioner

COPY

MAY 1 8 2001

Dr. Robert Weaver
Bayonne Industries, Inc.
321 St. Charles Street
New Orleans, LA 70130

Dear Dr. Weaver:

Re: In the Matter of the Bayonne Industries Site and Bayonne Industries, Inc.
City of Bayonne, Hudson County, New Jersey
Contaminated Site List No. NJD064288855
Memorandum of Agreement (MOA) dated 27 May 1992
Remedial Action Work Plan (RAWP) for the Closure of the Platty Kill Pond dated December 2000

The New Jersey Department of Environmental Protection (Department or NJDEP) has completed its review of the referenced document. Based on its review and discussions held during the 15 February 2001 meeting, the NJDEP is conditionally approving the RAWP. A summary of the RAWP proposals is presented below followed by the terms of this conditional approval:

Summary of Proposed Remedial Action

Bayonne Industries (BI) is proposing a remedial action for the Platty Kill Pond (PKP) that consists of installing a vertical containment barrier that will be keyed into the underlying glacial clay/gravelly clay to isolate the PKP. Two types of barriers are identified in the RAWP as potential options - steel sheet piling inside the existing bulkhead or a jet grout curtain outside the existing bulkhead. Based on discussions at the 15 February 2001 meeting, the NJDEP understands that BI is most likely going to proceed with the sheet pile alternative.

Four double-cased borings (one per side of the PKP) will be completed before installation of the barrier wall. These borings will be continuously split-spoon sampled to determine the depth that the wall must reach to achieve containment. Soil and liquid samples will also be collected to determine the appropriate grout mixture for the location. Once the barrier wall is in place, BI proposes to stabilize the petroleum-impacted sludge in the PKP such that the stabilized material would pass TCLP analysis for metals and have a hydraulic conductivity of $1x10^{-5}$ to $1x10^{-6}$ cm/sec. Since the stabilized mass will not achieve a hydraulic conductivity of $1x10^{-7}$, the vertical barrier wall will further contain the PKP and prevent interaction between the treated sludges and the surrounding ground water. After the stabilization is complete, a void will remain between the top of the stabilized material and the ground surface. BI proposes to fill the void space with contaminated soil and/or dredge material from the adjacent Platty Kill Canal and complete the remediation by installing a cap over the area. A Deed Notice will also be established for the encapsulated area.

Conditions/Clarification

1. **Applicable Remediation Standards, Section 3.1**

The NJDEP clarifies that the Technical Requirements for Site Remediation (TRSR), N.J.A.C. 7:26E-1.8 defines an unrestricted use standard in as *a numeric remediation standard that, when achieved, restores the contaminated media to a condition or quality suitable for any use.* For soils, the unrestricted use standard is the lowest of any numeric standard including, without limitation, any residential use standard, any non-residential use standard and any applicable impact to ground water soil standard. Thus, the unrestricted use standard for any contaminant would be the lowest numeric value of the Residential Direct Contact Soil Cleanup Criteria (RDCSCC), the Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC), and the Impact to Ground Water Soil Cleanup Criteria (IGWSCC). In addition, while ecological criteria were not developed for the PKP, BI is advised that ecological criteria developed for the remainder of the site may alter the unrestricted use standard.

2. **Pre-Construction Activities, Section 5.2**

- Pipeline Abandonment

Plugging the inactive pipelines at the bulkhead interface by injecting a low permeability cement-bentonite grout may not be sufficient. The presence of the pipelines may interfere with the installation of an exterior grout curtain and the portions of the pipes that protrude through the bulkhead may impede remedial efforts within the PKP. Also, the relative depths of the abandoned pipelines may be cause for concern. If the pipelines are situated at depths that would leave them immersed (completely or partially) by the contaminated ground water and product that exists in the vicinity of the PKP, they could potentially collect the contamination and impede future remedial actions. The NJDEP recommends that BI remove all portions of the pipelines that protrude through the existing bulkhead and that any portions left underground should be completely filled with low permeability materials.

- Final Pond Residual Material Stabilization Reagent Mixture & Design

This section suggests that a pug mill may be utilized to mix the sludge and reagents. BI must provide a scaled map that depicts the locations of the pug mill and any other remedial treatment units to satisfy the requirements promulgated at N.J.A.C. 7:26E-6.2(a)6.i.

- Water Management Program/Final Cap Design

BI proposes to install a low-permeable soil cap (i.e., clay). No additional information is provided on the composition of the cap, whether it will include topsoil with a vegetative layer or be used as a parking lot. The RAWP indicates that detailed design for the cap will be provided for NJDEP review/approval at some later date (June 2004). BI must justify this delay in supplying the detailed cap design. In addition, a detailed description of site restoration plans, as stipulated in N.J.A.C. 7:26E-6.2(a)12, shall be provided.

BI also proposes to prepare a plan for submission to the NJDEP for approval and modification to the wastewater discharge permits. BI must work with the appropriate permitting office to obtain this approval/modification. However, the Site Remediation Program is concerned about the effect that accumulated water will have on the stabilized material during the two-year period between stabilization and final capping. Therefore, BI must modify its plan or revise the schedule to in BI eliminate potential adverse effects to the stabilized materials.

3. **Remedial Action Methodology, Section 5.3**

- Containment Wall Installation

As previously stated BI presents two containment options that will be pursued during the design phase. However, BI indicated during the meeting that the internal sheet pile option would likely be pursued for the containment wall. This conditional approval of the RAWP acknowledges that BI must finalize its design work and requires that the design plans be submitted for NJDEP review/approval prior to implementation.

In addition, this conditional approval requires that should BI propose the internal sheet pile option, the contamination between the existing bulkhead and the internal sheet pile must be addressed through an acceptable alternative remedial action(s). BI shall propose a method to handle the free/residual product in this space in a manner that is consistent with the TRSR. BI is reminded that, pursuant to N.J.A.C. 7:26E-6.1(d), which applies to all remedial actions, all free and or residual product shall be removed or treated, or contained if removal or treatment are not practicable.

The NJDEP is also concerned that the clay/coarse gravel mix described in Weston's logs might not be amenable to driving of sheet piling, and also that such material might not form a tight seal around the bottom of the sheet pile, if this remedial option were to be chosen. Without a tight seal, free product and/or contaminated ground water from outside the containment area could leak into the proposed containment structure. BI shall explain how they will ensure that a tight seal is established between the proposed barrier wall and the underlying gravelly clay.

- Pond Residual Material Stabilization

BI states that pumping/mixing will be complete when either the entire pond is stabilized/fixated or when 1½ to 2 times the volume of sludge has been pumped/mixed, which ever is greater. The Department clarifies that the remedial objective is to stabilize all of the contaminated material in the PKP and achieve a permeability of $1x10^{-6}$ centimeters per second. Satisfactory completion of the stabilization must be measured by the permeability of the end product, not its volume.

4. **Remediation Performance Verification, Section 5.4**

The proposed TCLP analyses are appropriate to demonstrate whether or not the fixated matrix will allow contaminants to leach from the stabilized material. However, the RAWP does not provide details regarding the actual sampling plan such as the number of samples, types of samples (i.e. – composite or discreet). Said details must be provided for NJDEP review/approval. In addition, the need to collect/analyze discreet samples of the stabilized material to obtain data for comparison to the SCC is not addressed. The Deed Notice documents the contaminant levels that exceed the SCC; it does not record TCLP data. The NJDEP recommends that BI propose to include the existing chemical characterization data from the PKP for this purpose. BI must also provide details on how it plans to conduct the proposed external monitoring of outmigration and inmigration.

5. **Soil Reuse Plan, Section 6.2**

The conceptual proposal to beneficially reuse on-site soil to backfill the PKP is conditionally acceptable provided that BI submits a detailed soil reuse plan as proposed. The schedule must be revised to indicate when the soil reuse plan will be submitted for NJDEP review/approval. The Department recommends that BI identify the areas from around the site that are candidates for soil reuse and submit the soil reuse plan in the near future so that the soils from those areas may be reused in the PKP without delay.

6. **Construction Monitoring Plans, Section 7.0**

This section of the RAWP lists four plans that are required for project implementation – 1) Construction Health and Safety Plan, 2) Quality Assurance Project Plan, 3) Soil Erosion and Sediment Control Plan (SESC) and 4) Odor and Dust Control (ODC) Plan. However, the SESC Plan and the ODC Plan are not provided and the schedule does not indicate when they will be submitted to the NJDEP. BI must provide copies of both plans even though the SESC Plan must be reviewed/approved by the local soil conservation district. Also, the NJDEP clarifies that the ODC Plan must also contain proposals for perimeter/ambient air monitoring.

7. **Long-term Monitoring, Section 8.0**

The plans mentioned in this section (i.e. - explicit water management program, remedial action monitoring plan and biennial certification/monitoring plan) must be submitted to this office for review/approval.

8. **Draft Deed Notice, Section 10.0**

The Draft Deed Notice satisfies the administrative requirements for RAWP submittal and appropriately notes that many of the final components cannot be provided at this time. Please refer to comment 4 of this correspondence with regard to the requirements for Exhibit B.

9. **Classification Exception Area (CEA), Section 11.0**

BI is advised that while a CEA is required/appropriate, it is premature to establish a CEA for just the PKP at this time. The PKP is only a small portion of the site and the Department anticipates that a CEA(s) will be established for all or parts of the site when a site-wide RAWP is approved for the site. A CEA should be established for the PKP at that time.

BI shall clarify why they are proposing free petroleum product as the contaminant of concern for this CEA. It is anticipated that, once the containment is completed, all of the free product inside the containment would be pumped out along with accumulated water and sent to the site wastewater treatment plant. It is also anticipated that, once the containment and stabilization are completed, any residual product would be immobilized and ground water as well as free product outside the containment area would not be able to migrate into the PKP. This scenario would result in no free product remaining within the containment area.

BI shall clarify which previous investigations they are referring to when they state that such investigations indicated that the water table zone in the overburden is the only impacted aquifer at the site. The NJDEP has not been presented with any data from any deeper investigations at the BI site that would support this statement.

10. **Project Schedule, Section 14.0**

BI must provide a revised schedule that depicts proposed submittal dates, review times and approval dates for all of the plans/documents that remain outstanding. BI shall explain to NJDEP why they anticipate that it will take two years (May 2002-May 2004) to fill the space between the top of the stabilized sludge and surrounding ground surface with soil. BI must reduce this time period as much as possible or provide a detailed explanation why a two-year period is required between sludge stabilization, filling the void space and capping the PKP. The NJDEP is concerned that exposure to the elements (rain, snow, and high/low temperatures) will have adverse impacts on the stabilized sludge materials.

As for the last five items listed in the schedule, the sequence of events is not consistent the NJDEP requirements for this project. The final cap will have to be installed, as it is a key component of the engineering controls for the PKP. The as-built details for the final cap must be integrated into the Remedial Action Report, which must include the Final Deed Notice and be submitted for NJDEP review/approval. Once approved, BI must then record the Final Deed Notice with the Hudson County Clerk.

11. Health and Safety Plan (HASP), Appendix E

BI must provide a revised HASP to this office prior to implementation. The revised HASP must be for all activities, contractors and subcontractors involved in the project and conform to federal requirements of the Occupational Safety and Health Administration (OSHA) in accordance with 29 CFR 1910 and 29 CFR 1926 pursuant to N.J.A.C. 7:26E-1.9 and 6.2(a)11. Among the items to be addressed, the current HASP does not identify certain key personnel and indicates that subcontractors must provide appendices once they are selected. Furthermore, since the final details of the RAWP have not been determined, the current HASP cannot be specific to these unidentified activities.

12. Quality Assurance Project Plan (QAPP), Appendix F

The QAPP requires clarification, submission and/or revision of certain items prior to implementing the RAWP:

Subsurface Soil Sampling - This section can be interpreted to suggest that the red clay will be sampled for TCLP analyses. Concerns regarding this issue should be resolved through the submission of the sampling plan discussed in comment 4, above. Also, the Boring Log Form (Figure 1) is not provided.

Test Pit Soil Sampling - All test pits shall be logged in accordance with N.J.A.C. 7:26E-3.6(a) 2.

Liquid Measurements - The Water Level/Product Thickness Form (Table 2) is not provided.

13. Response from BI

During the 15 February 2001 meeting, BI and the Department discussed the potential for BI to submit a "Technical Memorandum" in response to this conditional approval letter. Please contact me upon your receipt of this correspondence so that we may discuss this matter further.

If you have any questions, please contact me at (609) 633-0739 or via email at *mkenney@dep.state.nj.us*.

Sincerely,

Michael S. Kenney

Michael S. Kenney, Case Manager
Bureau of Case Management

c: James Monkowski, Bayonne Health Department
Andrew Cozzi, Bluestone Environmental Services, L.L.C.
Mary Hrenda, BGWPA
John Boyer, BEERA
Chris Kanakis, BCM

BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.
35 Zeller Drive
Somerset, NJ 08873
Phone: 732 873 6929
Fax: 732 873 3043
Web: www.bluestonecorp.net

TECHNICAL MEMORANDUM

TO: Mike Kenney, NJDEP

CC: George Bress, IMTT
Rusty Walker, IMTT
Dr. Bob Weaver, IMTT
John Chapman, OCC

FROM: Andy Cozzi, Bluestone Environmental

DATE: June 26, 2001

RE: Findings and Results of Forward Engineering Tasks – December 2000, PKP RAWP

This technical memorandum has been prepared at the request of the NJDEP during the February 9, 2001 meeting in Trenton to discuss the report entitled "Remedial Action Workplan for the Closure of the Platty Kill Pond, December 2000". The information provided herein is a status report on the findings of forward engineering tasks undertaken since the Remedial Action Work Plan (RAWP) was submitted. These tasks were outlined in Section 6.0 Forward Engineering of the work plan.

The numbering system for Section I is consistent with the Forward Engineering Section of the RAWP for convenience of cross-reference. Section II of this memorandum provides the engineering justification and reasoning for driving the sheet pile barrier wall two to three-feet outboard of the existing bulkhead wall. Section III of this memorandum addresses a consideration raised in our meeting by the case geologist to possibly incorporate free phase product collection between the sheet pile pond containment wall and the existing wooden bulkhead.

Section I: RAWP Forward Engineering Findings

(Ref. RAWP Section 6.1)

6.1 Containment Barrier

6.1.1 Construction Design Borings

Four pre-design soil borings were originally proposed in the RAWP to determine information for the possible design of a grout wall. The boring would have confirmed the clay bottom depth *outside* the wooden bulkhead structure and provide bulk liquid and soil samples for grout mix design.

Early selection of the sheet pile wall barrier as preferable to the grout wall made these borings unnecessary. The selection was based primarily on the more standardized nature of sheet piling, which allows for prompt installation with little uncertainty.

6.1.2 Vibrocore Sampling for Testing the Support Strength Offered by Clay and Sludge

On January 15, 2001 Vibrocore samples were collected from the Platty Kill Pond (PKP) to obtain laboratory, unconsolidated-undrained compression strength data on the sludge and clay. Four borings were completed and labeled OCC-01 through OCC-04. Logs and the results of the laboratory geotechnical testing are included in Attachment A. These results are currently being utilized by Ocean and Coastal Consultants, Inc. (OCC) to develop final sheet pile design parameters.

6.1.3 Impact of Existing Obstructions on the Sheet Piling Option

A program of investigating the intended perimeter containment option of steel sheet piling was initiated during the week of December 11th, 2000. An established and experienced marine contracting firm (Simpson & Brown, Inc. of Cranford, New Jersey) mobilized a large hydraulic backhoe, and under the supervision of IMTT personnel, examined subsurface conditions at approximately 50 feet intervals around the pond. Using historical construction drawings of the bulkhead structures, the program was intended to identify and quantify the types of obstructions that might impede installation of the perimeter bulkhead structure.

The proposed sheet-piling barrier will be driven two to three-feet outboard, or water ward, of the existing timber bulkheads. The excavations along three sides (North, West, and South) all showed varying amounts of riprap stone present in a consistent pattern (described below). The reach of the backhoe was approximately 20 feet below the tracks of the machine. In most cases, there was a five to six foot thick blanket of riprap stone which was stacked predominantly against the timber bulkheads sloping away as the excavator reached farther into the pond. In most cases, a softer silt material that was easily probed with the tip of the excavating bucket was found underneath the riprap. However in two locations (Northeast and Southeast corners), this medium sized riprap stone was encountered as far as the excavator could reach, or about 18 to 20 feet below the tracks of the machine. Therefore, it is likely that the riprap extends deeper in these locations, presumably to the depth to which the pond may have been dredged at one time.

The size and scope of riprap encountered throughout the excavation program conducted will not prevent the installation of steel sheet piling around the perimeter of the pond, but it will be necessary to excavate and remove the rock obstructions prior to driving the piling.

6.1.4 Grout Curtain Perimeter Construction Subsurface Evaluation

The subsurface evaluation for a possible grout curtain installation as a barrier has been cancelled due to the selection of sheet pile as a containment barrier. Evaluation of the process with a potential contractor indicated that the grout curtain might not be as trouble free as piling due to unknown subsurface obstructions.

6.1.5 Construction of Containment Along the Run of the Dam

An excavator was used to confirm the construction of the dam that separates the PKP from the Platty Kill Canal (PKC). Findings indicated that the construction included a sand core with a varying thickness of riprap stone sides as depicted in the 1979 Weston Report. While these excavations confirmed the presence of the sand, for reasons of preserving the integrity of the dike structure, deep excavations were not conducted.

Based on findings to date, it is anticipated that the proposed sheet pile containment can be readily driven to the necessary depth along the run of the dam.

6.1.6 Interface of the Pond Containment With Canal Remediation Project

Note: In the RAWP, this section explains engineering design considerations being taken to connect the PKP containment to the proposed Platty Kill Canal containment. There have been no further developments on this straightforward design. The proposal for "hot spot" delineation has received a conditional approval from the Department.

6.1.7 Choice of Reagent Mix for Fixated Sludge

The final selection of the fixation reagent mix is to be made after contractor selection. Contractors and associated mixing equipment will be determined through a bidding process initiated in April 2001 consistent with obtaining sufficient approval of the RAWP from the Department. (The Department is aware of earlier fixation feasibility studies which demonstrated that fixation is possible and that the final mix can best be determined by the contractor and IMTT once the mechanics are finalized.)

Section II: Engineering Considerations for Placement of the Sheet Pile Barrier

(Ref. RAWP Section 6.2)

6.2.1 Engineering Issues

The PKP is sided with timber bulkheads on three faces, and a solid fill dike on the canal side. In December of 2000, BI submitted a remedial action work plan document, a portion of which indicated the use of a steel sheet pile perimeter containment structure around the PKP. The proposed containment structure would be installed outboard of the existing timber bulkheads. The following paragraphs will describe the proposed perimeter containment construction methodology and demonstrate the reasoning behind its selected location relative to the existing timber bulkhead structures.

The existing timber bulkhead structures were installed during the late 40's and early 50's. Little information is available concerning the depth of penetration of these structures, and more importantly, what remaining capacity can be counted upon to resist lateral earth pressures. What is known about the timber bulkheads is that there are extensive buried anchorage systems consisting of timber piles, steel tie rods, and various combinations of timber and steel elements designed to withstand horizontal loads. These structures are still functioning and are arranged in such a manner that would make

driving of any continuous wall system difficult without significant site disturbance (including cave-ins) and selective demolition. In consultation with experienced bulkhead contractors, the decision to place the new steel bulkhead water-ward of the timber bulkheads was an obvious one.

To determine the potential impacts of excavating in front of the timber bulkhead, historical documentation was reviewed as well as known soil properties on both sides of the bulkhead. Using this information, and with assumed cross section properties, a sensitivity analysis was performed. The analysis indicate that removing all material above the clay layer immediately adjacent to the timber bulkhead will have a severe impact on structural stability, will significantly increase bending stresses, as well as anchor loads imposed on buried anchorage structures. The analysis examined a variety of possible excavation depths in front of the timber bulkhead and the resulting impacts of each.

The results indicate that removal of material immediately outboard of the timber bulkhead must be limited to a maximum reasonable extent. This has been determined to be approximately elevation –6.5ft to –7.0ft. This elevation is approximately 10 feet above the clay layer, which begins at approximately –17.0ft. The material close to the bulkhead within this 10 feet zone has been characterized as a mixture of silty sands, gravel, and clay. In general, this zone is more dense along the edges of the pond, possibly due to consolidation from riprap or due to the nature of original pond construction. For the purposes of providing structural support for the timber bulkhead, this material serves an important role and should be left in place to avoid bulkhead collapse and follow-on cave-ins.

6.2.2 Construction and Site Logistic Constraints

A field investigation program was conducted with a local general contractor that has a significant amount of experience with marine structures, including bulkhead installation. The program was performed to explore the subsurface conditions along the interior of the pond adjacent to the timber bulkhead walls as well as along the centerline of the dike. The test excavations were performed along stations that were approximately 50 feet apart, and involved the use of land based hydraulic backhoe equipment. The results indicated that riprap was found along several areas of the bulkhead in varying thicknesses. The general trend was for the riprap to thin out as the excavation moved away from the bulkhead into the pond. This is consistent with a theory of placement which suggested that the riprap was originally placed against the face of the timber bulkheading for structural reasons. However, there were two locations where the riprap was much thicker, and will likely have to be removed by clamshell bucket. This will place a great deal of stress on the existing timber structure during excavation unless the new line of sheeting is moved further into the pond. Under all circumstances and all phases of the pond remediation project, it is assumed that minimizing disturbance of the existing timber bulkhead structures is important. Placing the new bulkhead waterward will reduce the amount of riprap excavation required, and therefore minimize structural impacts to the existing bulkhead.

To setup the sheet piling and make ready for driving, a falsework assembly must be installed which is a temporary system of piling and beams which allow the steel sheet piles to be setup and connected together to form a section of 40 to 50 feet long. This is necessary to keep the piling from moving out of alignment, especially during difficult driving. The falsework assembly includes horizontal guide beams that are at two elevations, one near the top of the bulkhead and one near the low water line. It is typical for most bulkhead replacement projects to have an offset of approximately 18" to facilitate driving a new wall system waterward and provide enough space for temporary falsework and structural fill between the two walls. Even if there was a practical method to setup and

drive new steel sheet piling directly against the face of the existing, there are continuous timber walers along the face of the bulkhead which prevent getting the new piling directly against the face.

The proposed location of the perimeter containment sheet piles will be approximately three feet off the face of existing structures. This location will allow for a bucket to be used between the new and old bulkheads to remove material that is accessible and safe to remove. Contamination in the limited deep material which remains will be laterally contained and available for removal through the recovery system described in Section III of this report.

Section III: Follow on Free Product Recovery around the Containment Barrier

The installation of the sheet pile outboard of the PKP bulkhead will include the construction of a recovery zone for free product recovery around the barrier perimeter with the aim of further protecting the remediated materials within. When operational, the recovery system will control any product from the underlying residual material left above the clay as well as recovering liquids that may migrate in toward the fixated pond from the surrounding property.

It is proposed to accomplish this perimeter free product recovery by installing a gravel-pipe or "french" drain outside and adjacent to the sheet pile barrier and inside the wooden bulkhead. The french drain will be installed continuously around the north, south and west sides of the barrier. A specific design will be developed that will take into consideration an anticipated post closure (PKP and PKC) reduction in tidal fluctuations in the ground water level.

Once the sheet pile installation activities are completed and the french drain and sump(s) installed, it will be possible to establish hydraulic control along the perimeter of the pond to collect free or dissolved product that collects along the outer wall of the sheet pile. Again, the system would serve a two-fold purpose: (1) to recover free and residual product from around the PKP and (2) prevent the inward migration of any contaminants into the former pond that could potentially re-contaminate the stabilized and fixated sludge and any other material ultimately used for filling the pond to grade.

A detailed design for this french drain construction will be developed upon the Department's approval of this approach and will be incorporated into the pending RAWP addendum. As noted earlier, the system will be in the annular space between the sheet pile and the bulkhead. This area will be backfilled with a porous and permeable media (such as stone or pea gravel). Recovery sumps will be installed possibly in the two western corners of the pond and/or possibly at the mid-points of the north, west and south walls; and linked with perforated PVC drain pipe to create a french drain type configuration around the land sides of the pond. The upright recovery wells (sumps) will be screened across the high mean water level through the low mean water level, with additional screen to account for extremes in water level fluctuation. The connecting laterals will be set across the low mean water level.

Based on testing for the extent of migration of product, belt skimmers, pneumatic-operated recovery pumps or total fluids pumps will be selected to collect any accumulating free product. Product entrained or dissolved in ground water will be transferred into an oil-water separator and ultimately pumped to the facility's treatment plant for treatment and discharge under the existing permit.

BLUESTONE ENVIRONMENTAL
SEDIMENT CORE LOG

Client : Bayonne Industries, Inc.	Project : Platty Kill Pond - Bayonne, NJ	Logger: AEF
Job#: IMT01PND	Date: 1/15/01 Time : 1430	
Sample location, DGPS Coordinates:		
Core # OCC-1 Offset Distance 10.0 ft	DTW(ft)	HDOP=
Project Depth (inc 2 ft. overdredge) [PD]:	Core Penetration Length:	15.0 ft
Tide Adjust [TA] (+/- ft. from MLW):	Recovered Core Length:	10.0 ft
Depth to top of water from bulkhead: 7.0 ft	Sample Length Retained:	
Measured water depth: 5.0 ft	Core Volume Retained:	
Depth to top of sludge from bulkhead: 12.0 ft	Collected to Project Depth:	No

Sample Interval & Designation	PID Reading	Description
Top 12.0 ft bmp 17.0		No recovery
17.0 ft bmp 23.0	ppm	Black sludge
23.0 ft bmp 27.0	ppm	Black sandy sludge w/ some black clay w/ vegetative matter
		Note: Rock in tip, no further recovery
Bottom		

# of containers: type of container: other

Water and surface conditions:
Ice in boring location
Comments:
Rock in tip, no further recovery

Core Volumes

Nominal core-barrel diameter	EST. Volum
3.5"	.3gal/ft
4.0"	.5gal/ft
6.0"	1.5gal/ft.

Live Organisms present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

2/6/01

BLUESTONE ENVIRONMENTAL
SEDIMENT CORE LOG

Client : Bayonne Industries, Inc.	Project : Platty Kill Pond - Bayonne, NJ	Logger: AEF
Job#: IMT01PND	Date: 1/15/01 Time : 1515	
Sample location, DGPS Coordinates:		
Core # OCC-2 Offset Distance 30.0 ft	DTW(ft)	HDOP=
Project Depth (inc 2 ft. overdredge) [PD]:	Core Penetration Length:	20.0 ft
Tide Adjust [TA] (+/- ft. from MLW):	Recovered Core Length:	13.0 ft
Depth to top of water from bulkhead: 7.0 ft	Sample Length Retained:	
Measured water depth: 5.5 ft	Core Volume Retained:	
Depth to top of sludge from bulkhead: 12.5 ft	Collected to Project Depth:	Yes

Sample Interval & Designation	PID Reading	Description
Top 12.5 ft bmp 19.5		No recovery
19.5 ft bmp 26.5	ppm	Black sandy sludge (sample collected at 25' to 26')
26.5 ft bmp 32.5	ppm	Red silty clay - plastic (sample collected at 31' to 32')
Bottom		

# of containers:	type of container: other	Core Volumes: Nominal core-barrel diameter	EST. Volume
Water and surface conditions:		3.5"	.3gal/ft
Ice in boring location		**4.0"**	.5gal/ft
Comments:		6.0"	1.5gal/ft.
Located in same position as OCC-1 except 30' offset			

Live Organisms present	Y	N	
Oil Present	Y	N	
Odor Present	Y	N	
Debris Present	Y	N	
Within 10% of Req'd Core Length	Y	N	
Photo	Y	N	

2/6/01

ver 072298

BLUESTONE ENVIRONMENTAL
SEDIMENT CORE LOG

Client : Bayonne Industries, Inc.	Project : Platty Kill Pond - Bayonne, NJ	Logger: AEF
Job#: IMT01PND	Date: 1/15/01 Time : 1600	
Sample location, DGPS Coordinates:		
Core # OCC-3 Offset Distance 25.0 ft	DTW(ft)	HDOP=
Project Depth (inc 2 ft. overdredge) [PD]:	Core Penetration Length:	20.0 ft
Tide Adjust [TA] (+/- ft. from MLW):	Recovered Core Length:	14.0 ft
Depth to top of water from bulkhead: 7.0 ft	Sample Length Retained:	
Measured water depth: 5.3 ft	Core Volume Retained:	
Depth to top of sludge from bulkhead: 12.3 ft	Collected to Project Depth:	Yes

Sample Interval & Designation	PID Reading	Description
Top 12.3 ft bmp 18.3		No recovery
18.3 ft bmp 27.3	ppm	Black sandy sludge (sample collected at 21' to 22')
27.3 ft bmp 32.3	ppm	Red silty clay - plastic (sample collected at 31' to 32')
Bottom		

# of containers:	type of container: other	Core Volumes: Nominal core-barrel diameter	EST. Volume
Water and surface conditions:		3.5"	.3gal/ft
Ice in boring location		4.0"	.5gal/ft
Comments:		6.0"	1.5gal/ft.

Live Organisms present	Y	N	
Oil Present	Y	N	
Odor Present	Y	N	
Debris Present	Y	N	
Within 10% of Req'd Core Length	Y	N	
Photo	Y	N	

2/6/01 *ver 072298*

BLUESTONE ENVIRONMENTAL
SEDIMENT CORE LOG

Client : Bayonne Industries, Inc.	Project : Platty Kill Pond - Bayonne, NJ	Logger: AEF
Job#: IMT01PND	Date: 1/16/01 Time : 0930	
Sample location, DGPS Coordinates:		
Core # OCC-4-R Offset Distance 40.0 ft	DTW(ft)	.HDOP=

Project Depth (inc 2 ft. overdredge) [PD]:		Core Penetration Length:	18.0 ft
Tide Adjust [TA] (+/- ft. from MLW):		Recovered Core Length:	6.0 ft
Depth to top of water from bulkhead:	7.2 ft	Sample Length Retained:	
Measured water depth:	5.0 ft	Core Volume Retained:	
Depth to top of sludge from bulkhead:	12.2 ft	Collected to Project Depth:	No
			Refusal

Sample Interval & Designation	PID Reading	Description
Top 12.2 ft bmp 24.2	0.2 background	No recovery
24.2 ft bmp 26.2	ppm	Black silty sludge
26.2 ft bmp 30.2	4 ppm	Black sandy sludge (sample collected at 29')
Bottom		

# of containers:	type of container: other	Core Volumes: Nominal core-barrel diameter	EST. Volume
Water and surface conditions:		3.5"	.3gal/ft
Ice in boring location		**4.0"**	.5gal/ft
Comments:		6.0"	1.5gal/ft.

Refusal also at first location approx. 4' depth. Measured 3' depth to sludge at that location.

Live Organisms present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

2/6/01

ver 072298

BLUESTONE ENVIRONMENTAL
SEDIMENT CORE LOG

Client : Bayonne Industries, Inc.	Project : Platty Kill Pond - Bayonne, NJ	Logger: AEF
Job#: IMT01PND	Date: 1/16/01 Time : 0800	
Sample location, DGPS Coordinates:		
Core # OCC-5 Offset Distance 55.0 ft	DTW(ft)	HDOP=
Project Depth (inc 2 ft. overdredge) [PD]:	Core Penetration Length:	18.0 ft
Tide Adjust [TA] (+/- ft. from MLW):	Recovered Core Length:	11.0 ft
Depth to top of water from bulkhead: 7.2 ft	Sample Length Retained:	
Measured water depth: 5.0 ft	Core Volume Retained:	
Depth to top of sludge from bulkhead: 12.2 ft	Collected to Project Depth:	No
		Refusal

Sample Interval & Designation	PID Reading	Description
Top 12.2 ft bmp 19.2	0.2 background	No recovery
19.2 ft bmp 25.2	5 ppm	Black sandy sludge (sample collected at 24')
25.2 ft bmp 30.2	0.3 ppm	Red silty clay - plastic (sample collected at 29')
Bottom		

# of containers:	type of container: other	Core Volumes: Nominal core-barrel diameter	EST. Volume
Water and surface conditions:		3.5"	.3gal/ft
Ice in boring location		**4.0"**	.5gal/ft
Comments:		6.0"	1.5gal/ft.

Located in same position as OCC-4-R except 55' offset

Live Organisms present	Y	N	
Oil Present	Y	N	
Odor Present	Y	N	
Debris Present	Y	N	
Within 10% of Req'd Core Length	Y	N	
Photo	Y	N	

2/6/01 *ver 072298*

PAULUS SOKOLOWSKI and SARTOR
CONSULTING ENGINEERS

67 MOUNTAIN BOULEVARD EXTENSION
P.O. BOX 4039
WARREN, NEW JERSEY 07060

UNCONSOLIDATED-UNDRAINED ☒
UNCONFINED COMPRESSION ☐

TESTED BY: LL Sr.
DATE: 2/21/01

PROJECT BLUESTONE ENV. JOB NO. 2481-0001-03
LOCATION BAYONNE, NJ
DESCRIPTION OF SAMPLE Red br. CLAY & SILT

BORING NO. OCC-A SAMPLE NO. ?
DEPTH OF SAMPLE 32'
— VIBROCORE SAMPLE —
SAMPLE DATA: RING 18410
AREA Ao 6.49 in² LENGTH Lo 6 in
INITIAL VOLUME Vo 38.94 in³ = 0.0225 ft³
CELL NUMBER 1 STRAIN RATE %/min 1.00

WATER CONTENT	1	2
CONTAINER NO.	Tube	#2
WT. CONT. & WET SOIL gm	1654.5	1353.7
WT. CONT. & DRY SOIL gm	1386.6	1086.0
WT. WATER Ww gm	267.9	267.7
WT. CONT. gm	398.6	98.0
WT. DRY SOIL, Ws gm	988.0	988.0
WATER CONTENT, w %	27.1	27.1

TOTAL WEIGHT OF SPECIMEN
BEFORE TEST 1255.9 gm ; AFTER TEST 1255.7 gm
UNIT WEIGHTS OF SOIL
WET γ 123.1 lb/ft³ ; DRY γd 96.9 lb/ft³

COMPUTED DATA
ΔL AT FAILURE 0.720 in
UNIT STRAIN: $\epsilon = \frac{\Delta L}{Lo}$ 0.120 in
AREA CORRECTION FACTOR: 1-ε 0.88
CORRECTED AREA: $\frac{Ao}{1-\epsilon}$ 7.38 in²
LOAD AT FAILURE: P 142.06 lbs
DEVIATOR STRESS: σ 19.25 psi
LATERAL PRESSURE: σ_3 6.5 psi
VERTICAL STRESS: $\sigma_1 = \sigma + \sigma_3$ 25.75 psi

FAILURE SKETCH

ELAPSED TIME	STRAIN DIAL	LOAD DIAL	LOAD (lbs)	DEV. STRESS (PSI)	% STRAIN
START 14:08:00	0.000"	0.0000"			
	0.030	0.0012	14.27	2.19	0.5
	0.060	0.0025	26.31	4.01	1.0
	0.120	0.0046	45.76	6.91	2.0
	0.180	0.0065	63.35	9.47	3.0
	0.240	0.0082	79.09	11.70	4.0
	0.300	0.0095	91.13	13.34	5.0
	0.360	0.0107	102.24	14.82	6.0
	0.420	0.0118	112.43	16.11	7.0
	0.480	0.01285	122.15	17.32	8.0
	0.540	0.0136	129.10	18.11	9.0
	0.600	0.0142	134.65	18.68	10.0
	0.660	0.0147	139.28	19.11	11.0
→	0.720	0.0150	142.06	19.25	12.0
	0.780	0.01505	142.52	19.10	13.0
	0.840	0.0149	141.13	18.69	14.0
	0.900	0.0144	136.50	17.87	15.0
	0.960	0.0142	134.65	17.42	16.0
	1.020	0.0140	132.80	16.98	17.0
	1.080	0.0138	130.95	16.55	18.0
	1.140	0.01375	130.49	16.29	19.0
END 14:28:04	1.120	0.0137	130.02	16.05	20.

PAULUS SOKOLOWSKI and SARTOR
CONSULTING ENGINEERS

67 MOUNTAIN BOULEVARD EXTENSION
P.O. BOX 4039
WARREN, NEW JERSEY 07060

UNCONSOLIDATED-UNDRAINED ☒
UNCONFINED COMPRESSION ☐

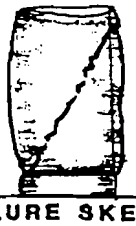
TESTED BY: LL ST.
DATE: 2/21/01

PROJECT BLUESTONE ENV. JOB NO. 2481-0001-03
LOCATION BAYONNE, NJ
DESCRIPTION OF SAMPLE Red brn CLAY & SILT, tr. c-f sand
BORING NO. OCC-5 SAMPLE NO. 7
DEPTH OF SAMPLE 29'
~ VIBROCORE SAMPLE ~
SAMPLE DATA: RING 18410
AREA Ao 6.49 in² LENGTH Lo 6 in
INITIAL VOLUME Vo 38.94 in³ = 0.0225 ft³
CELL NUMBER 2 STRAIN RATE %/min 1.07

WATER CONTENT	1	2
CONTAINER NO.	Tube	#1
WT. CONT. & WET SOIL gm	1435.0	1328.1
WT. CONT. & DRY SOIL gm	1390.9	1064.0
WT. WATER Ww gm	264.1	264.1
WT. CONT. gm	425.5	98.6
WT. DRY SOIL, Ws gm	965.4	965.4
WATER CONTENT, w %	27.4	27.4

TOTAL WEIGHT OF SPECIMEN
BEFORE TEST 1229.5 gm ; AFTER TEST 1229.5 gm
UNIT WEIGHTS OF SOIL
WET γ 120.5 lb/ft³ ; DRY γ 94.6 lb/ft³

COMPUTED DATA
ΔL AT FAILURE 0.900 in
UNIT STRAIN: $\epsilon = \frac{\Delta L}{Lo}$ 0.150 in
AREA CORRECTION FACTOR: 1-ε 0.85
CORRECTED AREA: $\frac{Ao}{1-\epsilon}$ 7.64 in²
LOAD AT FAILURE: P 137.89 lbs
DEVIATOR STRESS: σ 18.05 psi
LATERAL PRESSURE: σ_3 5.4 psi
VERTICAL STRESS: $\sigma_1 = \sigma + \sigma_3$ 23.45 psi

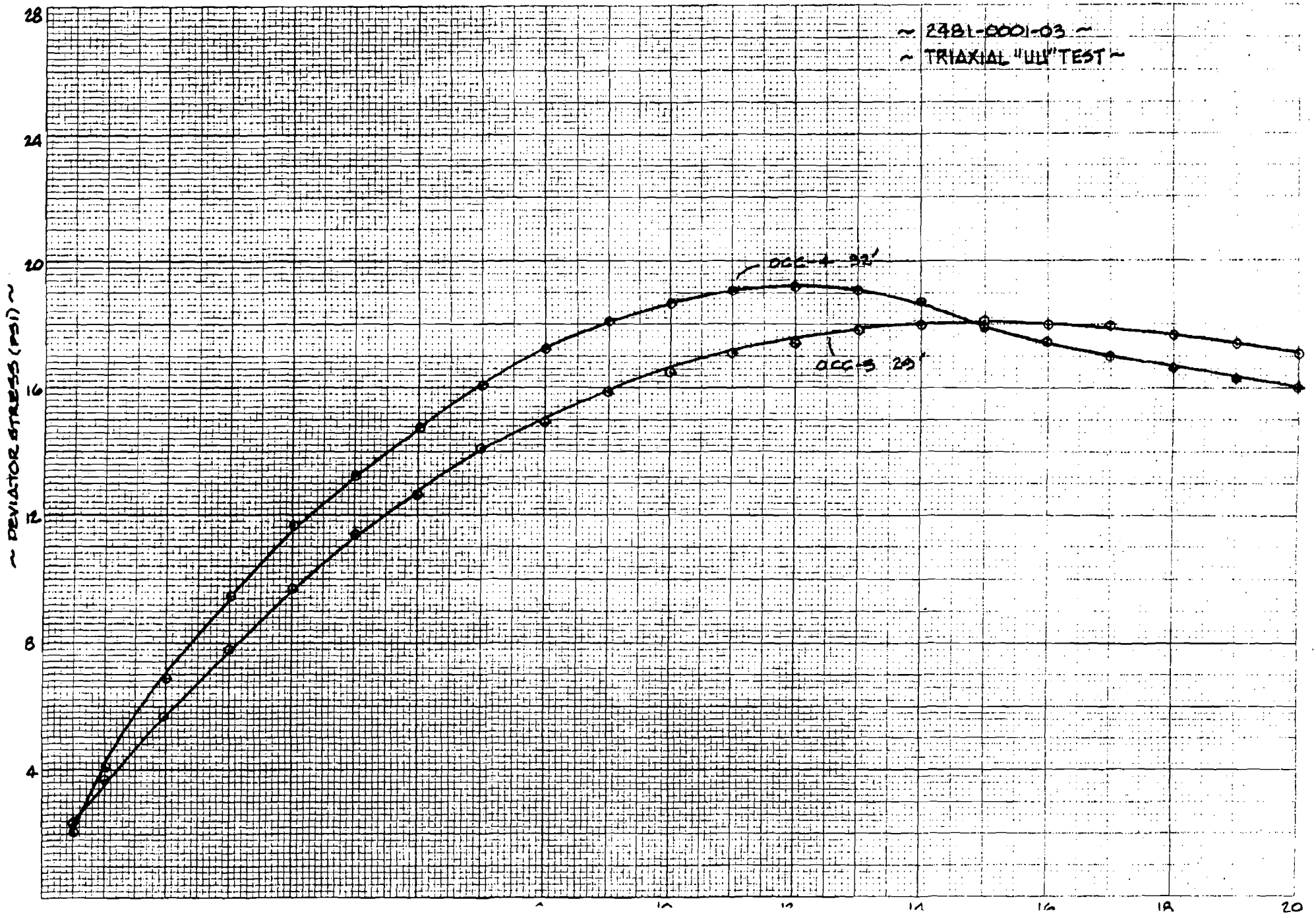


FAILURE SKETCH

ELAPSED TIME	STRAIN DIAL	LOAD DIAL	LOAD (lbs)	DEV. STRESS (PSI)	% STRAIN
START 13:05:00	0.000"	0.0000"			
	0.030	0.00125	14.74	2.26	0.5
	0.060	0.0023	24.46	3.73	1.0
	0.120	0.0087	37.42	5.65	2.0
	0.180	0.0053	52.24	7.81	3.0
	0.240	0.0067	65.20	9.65	4.0
	0.300	0.0081	78.17	11.44	5.0
	0.360	0.0091	87.43	12.67	6.0
	0.420	0.0103	98.54	14.12	7.0
	0.480	0.0110	105.02	14.90	8.0
	0.540	0.0119	113.35	15.90	9.0
	0.600	0.0125	118.91	16.49	10.0
	0.660	0.0131	124.47	17.07	11.0
	0.720	0.0135	128.17	17.37	12.0
	0.780	0.0140	132.80	17.80	13.0
	0.840	0.0143	135.58	17.96	14.0
~	0.900	0.01455	137.89	18.05	15.0
	0.960	0.0147	139.28	18.01	16.0
	1.020	0.01485	140.67	17.99	17.0
	1.080	0.0148	140.21	17.73	18.0
	1.140	0.0147	139.28	17.39	19.0
END 13:23:45	1.120	0.0146	138.36	17.06	20

NO. 340R-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

DIETZGEN CORPORATION
MADE IN U.S.A.



State of New Jersey

James E. McGreevey
Governor

Department of Environmental Protection
Bureau of Case Management
P.O. Box 028
401 East State Street
Trenton, NJ 08625-0028
Telephone: (609) 633-1455
Facsimile: (609) 633-1439

Bradley M. Campb
Commissioner

Dr. Robert Weaver
Bayonne Industries, Inc.
321 St. Charles Street
New Orleans, LA 70130

MAR 07 2002

Dear Dr. Weaver:

Re: In the Matter of the Bayonne Industries Site, Cogen Technologies, and Bayonne Industries, Inc.
City of Bayonne, Hudson County, New Jersey
Contaminated Site List No. NJD064288855
Memorandum of Agreement (MOA) dated 27 May 1992
Platty Kill Pond (PKP) Remedial Action Work Plan (RAWP)

The New Jersey Department of Environmental Protection (Department or NJDEP) has reviewed the 26 June 2001 letter that BI submitted in response to the Department's 18 May 2001 conditional approval. In summary, the submittal provides technical modifications to the remedial actions that are proposed by BI. In the submittal, BI confirms its selection of the remedial design that involves the installation of a sheet pile containment wall within the interior of the existing timber bulkhead. BI proposes to excavate the contaminated sludge between the containment wall and the existing timber bulkhead followed by the construction of a "french drain" style recovery trench around the exterior perimeter of the containment wall to establish a free product recovery zone in the void between the existing timber bulkhead. The contaminated sludge within the sheet pile containment wall will be treated through stabilization to a maximum permeability of $1x10^{-5}$ centimeters per second (cm/sec).

Please be advised that the proposals contained in the letter and its attachments are conditionally acceptable to the NJDEP as follows:

1. Construction Design Borings

The approved RAWP specified that double-cased borings would be installed at four locations around the perimeter of the PKP as part of the pre-design efforts. The main purpose of these borings was to determine the depth to the bottom of the underlying glacial clay/silt and use the data to establish the thickness of the glacial clay/silt. Establishing the thickness of this layer is required to address the Department's concerns regarding the potential to create a preferential contaminant migration pathway should the sheet pile penetrate the glacial clay/silt. However, BI did not perform the four borings in accordance with the approved RAWP and dismisses the borings as irrelevant/unnecessary in the 26 June 2001 submittal. The Department does not agree. As a condition of this approval, BI shall complete the four borings to establish the thickness of the glacial clay/silt. The bulk liquid and soil samples need not be collected to support decisions regarding grout mix design since this alternative has been eliminated. However, BI must demonstrate that the proposed sheet pile wall will be keyed into the underlying glacial clay/silt, with a minimum of two feet of clay beneath the bottom of the sheet pile, and not driven through it.

2. Containment Wall Installation

The RAWP conditional approval required that BI provide an explanation regarding how a tight seal would be formed between the sheet pile and the glacial silt/clay. This requirement reflected concerns about the potential for the product and/or dissolved ground water contamination that exists outside the PKP to migrate back into the PKP after the proposed remediation was completed. In response, BI provided an evaluation of existing data regarding the characteristics of the glacial clay/silt.

Please be advised that the NJDEP has reviewed all of the soil testing data provided for the glacial clay/silt beneath the PKP. Based on its review of the data that BI has provided, the NJDEP has determined that the data do not support the conclusions regarding the plasticity of the clay (see item 3 of the response letter). For example, BI states that the glacial clay/silt will provide a good seal around the bottom of the proposed sheet pile because of the medium-to-high plasticity exhibited by previous samples of the clay. However, the only laboratory tests for Atterberg limits (plastic limit, liquid limit and plasticity index) performed on the glacial clay/silt beneath the PKP was the 21 October 1998 test on a composite sample (PKP-Composite). The plasticity index (PI) of this sample was determined to be 9, which is classified as a low PI (i.e. - between 5 and 10).

As for the Vibrocore samples that were independently logged by the geotechnical laboratory using the Burmister Classification System, the laboratory identified the samples as ranging between "clayey silt" (having a slight PI of 1-5) and/or "clay and silt". Two of the independently logged samples were subjected to an unconsolidated-undrained unconfined compression test (OCC-4 and OCC-5). The laboratory describes both samples as "clay & silt", which according to the Burmister Soil Classification System (Suggested Method of Test for Identification of Soils by D. M. Burmister) have a medium degree of plasticity with a PI of 10-20. However, BI concludes that its clay & silt samples have a high plasticity index of 20-40 without having any test data to support this conclusion. Therefore, all of the data provided by BI indicates that this unit has a low-to-medium plasticity, not a medium-to-high plasticity as BI states in the response letter. In addition, BI does not address how the presence of gravel and cobbles in the clay/silt would affect its ability to form a seal around the sheet pile, an issue raised by the Department during the 9 February 2001 technical meeting. As a result, BI has not established that the glacial clay/silt beneath the PKP will provide a tight seal around the bottom of the sheet pile barrier.

Notwithstanding the absence of an acceptable response regarding this matter, the NJDEP is conditionally approving the proposal to proceed with the installation of the sheet pile containment wall as a component of the remedial action for the PKP. This conditional approval is specific to the PKP, assumes that BI will establish that the glacial clay/silt is of sufficient thickness (see comment 1, above) and requires that the sheet pile be driven a minimum of two-feet into the glacial clay/silt.

The NJDEP clarifies that this decision reflects a re-evaluation of the post-remediation conditions that will exist once BI completes the remediation of the PKP. In the event that the glacial clay/silt does not form a tight seal around the based of the sheet pile, dissolved ground water contamination may infiltrate back into the containment area. However, this dissolved ground water contamination will ultimately be addressed as part of the site-wide ground water remedial action that will include a Classification Exception Area (CEA). With respect to product, dense non-aqueous phase liquids have not been identified in this area. However, BI proposes to leave an undetermined volume of untreated contaminated sludge at the bottom of the space between the containment wall and the existing timber bulkhead. The amount of free and/or residual product that may remain in the untreated sludge is uncertain. Therefore, the potential for product to infiltrate back into the containment area at the top of the glacial clay/silt cannot be fully ascertained. The contaminated sludge that BI proposes to leave in place is further addressed in comment 3, below.

The NJDEP also clarifies that BI shall consider these comments on the formation of a tight seal between the glacial clay/silt and the sheet pile with respect to the future remediation of the Platty Kill Canal (PKC). The Remedial Action Selection Report (RASR) for the PKC was conditionally approved by the NJDEP on 13 July 2001 and does not include a proposal to stabilize the contaminated sediments. Although "hot spot" removal is envisioned for the PKC, the formation of a tight seal between the sheet pile containment wall and the glacial clay/silt shall remain an important design factor for the remediation of the PKC. Absent a tight seal, the effectiveness of the containment strategy for the residual contamination in the PKC sediments will be questionable.

3. **Excavation Between Sheet Pile Containment Wall and Existing Timber Bulkhead**

The NJDEP required BI to propose a method for removing, treating or containing (if treatment or removal is impracticable) the free residual product within the space to be created between the sheet pile barrier and the existing timber bulkhead. In response, BI proposes to excavate the contaminated sludge in this area. However, BI limits the depth of the proposed excavation based on the results of a sensitivity analysis that was apparently conducted with respect to engineering constraints posed by the timber bulkhead. The sensitivity analysis itself is not provided, but is referenced in the technical memorandum to support limiting the excavation to a depth of approximately 6.5 to 7.0 feet below mean sea level (-6.5 to -7.0 feet msl). In contrast, Drawing No. 99043.1-2-07, Bulkhead Sections and Details, Section A-A depicts the depth of the proposed excavation as 12 feet below mean sea level (-12 feet msl).

Upon consideration of the proposal and the discrepancy regarding the proposed depth of the excavation, the Department conditionally accepts the proposal to limit the excavation to a depth that corresponds with an elevation of -12 feet msl. However, this conditional approval requires that BI provide the sensitivity analysis conducted by BI along with a detailed explanation as to why other engineering measures (e.g. - shoring) cannot be utilized to provide for excavation to deeper depths. The sensitivity analysis and detailed explanation shall be incorporated into the pending RAWP Addendum, which shall also include contingency proposals for treating (e.g. - stabilizing) the product contaminated sludge that BI proposes to leave below the recovery trench.

4. **French-Drain Style Recovery Trench**

BI proposes to install a french drain style recovery system in the space between the sheet pile containment wall and the existing timber bulkhead to recover free product from this zone and prevent contamination from migrating back into the PKP after the remediation is complete. According to the technical memorandum, the design of this system will be finalized following NJDEP approval of this approach. The system will have 2-3 recovery sumps screened to intercept the mean high water level and the mean low water level, with additional screen to account for extreme high and low water levels. BI states that the type of recovery pumps will be selected based on the testing for migration of product into the french drain. The recovered water and product will be pumped to an oil-water separator and then pumped to the facility's wastewater treatment plant.

The concept is conditionally approved pending NJDEP review of a final design that shall be incorporated into the pending RAWP Addendum, which shall also address the following:

a. BI shall identify how they propose to test for migration of product into the French drain area around the Pond, and activity that is necessary for choosing the type of recovery pumps to install in this zone.

b. Belt skimmers (one of the possible types of product-removal mechanisms proposed for this zone) will not provide hydraulic control or be effective in preventing potential in-migration of contaminants to the PKP. Therefore, belt skimmers must be eliminated from consideration.

c. BI shall design the recovery system to prevent surface infiltration of runoff from the site (i.e. - pave the top of the trench).

5. Stabilization of Contaminated Sludge

BI indicates that available data suggest that a permeability of $1x10^{-6}$ cm/sec will actually be achieved for the stabilized sludge. However, BI also indicates that prospective contractors are reluctant to guarantee that this permeability will be achieved for the entire fixated mass. As a result, BI requests that the NJDEP note its concurrence with a proposal to achieve a maximum permeability of $1x10^{-5}$ cm/sec for the stabilized sludge. The Department conditionally accepts the $1x10^{-5}$ cm/sec proposal provided BI requires the selected contractor to make every effort to achieve a permeability of $1x10^{-6}$ cm/sec. This requirement shall be relayed in writing to the contractor and BI shall provide this office with confirmation that the contractor received the written instructions.

6. Installation of Sheet Pile along a Portion of the Platty Kill Canal (PKC)

As noted above, the Department conditionally approved the RASR for the PKC on 13 July 2001. Although the RASR includes the installation of a sealable, vinyl sheet-pile containment wall as part of the selected remedy, a RAWP for the PKC has not yet been submitted for NJDEP review/approval. However, BI has advised the Department that it must install a steel sheet pile wall along a portion of the PKC during the PKP mobilization for operational safety reasons. This sheet pile will be installed inside the existing bulkhead along the south side of the upper portion of the PKC that is oriented northwest-to-southeast. The existing timber bulkhead along this portion of the PKC is mostly dilapidated, has been in disrepair for years and has collapsed into the PKC. Due to lack of bulkhead integrity, safety concerns have arisen with respect to support structures for operational pipelines that are located in close proximity to the PKC.

Due to the urgency that BI now attributes to the restoration of this area, the Site Remediation Program is amenable to allowing BI to install the steel sheet pile along this portion of the PKC subject to the following conditions:

a. The steel sheet pile shall not penetrate the glacial clay/silt.

b. The steel sheet pile shall be installed a minimum of two (2) feet into the glacial clay/silt.

c. All of the product-contaminated soils on the bank of the PKC and the product-contaminated sediments (between the steel sheet pile and pipelines) shall be removed during the mobilization.

d. All contaminated materials (including the product-contaminated soils and sediments) shall be properly disposed if they are not consolidated into the PKP for treatment with the contaminated sludge.

In addition, the RAWP for the PKC will have to demonstrate that the steel sheet pile is an acceptable replacement for the sealable, vinyl sheet-pile containment wall. If for some reason BI fails to remove all of the product-contaminated sediments from the area between the steel sheet pile and the pipelines, BI shall propose a treatment alternative as part of a future RAWP.

7. Future Land Use and Site Restoration

In response to NJDEP concerns about maintaining the integrity of the stabilized sludge over time, BI proposes to establish a landscaped, non-use area on top of the PKP. This proposed end use addresses the NJDEP's concerns. However, the RAWP Addendum shall present a detailed description of the site restoration plans pursuant to N.J.A.C. 7:26E-6.2(a)12.

8. **Technical Memorandum - Attachment A**

This attachment was supposed to consist of logs of Vibrocore borings OCC-01 through OCC-04 and the results of laboratory geotechnical testing of these borings, but was omitted from the submittal. Based on a request by the NJDEP, BI's consultant sent the boring logs for OCC-1, OCC-2, OCC-3, OCC-4-R and OCC-5 along with copies of the geotechnical laboratory testing of samples from these borings via facsimile. The geotechnical testing reports consisted of results of unconsolidated-undrained unconfined compression tests on the clay (and possibly the sludge - see below) in the PKP to develop the final sheet pile design parameters. No boring location map has been supplied to the NJDEP. However, based on verbal inquiries to BI's consultant the Department obtained verbal descriptions of the locations for OCC-4 and OCC-5.

Based on the results of these efforts, the NJDEP has the following comments:

a. The geotechnical laboratory report form for soil sample OCC-4 describes the sample as consisting of red-brown clay and silt and notes that the sample depth as 32 feet. However, the log for Vibrocore boring OCC-4-R, from which the sample was presumably taken, indicates that the total depth of the boring was 30.2 feet. The log also indicates that the material encountered at the bottom of the boring was black sandy sludge (i.e. - no clay and silt was encountered in this boring) and that the sample from this boring was taken at a depth of 29 feet. (Please note: The log of boring OCC-4-R notes that the original boring OCC-4 encountered refusal, probably due to debris/riprap, after penetrating 4 feet into the sludge). BI shall resolve this discrepancy.

b. BI shall supply NJDEP with a map showing the locations of borings OCC-1, OCC-2, OCC-3, OCC-4, OCC-4-R and OCC-5.

c. <u>All</u> future submittals that provide summaries of work performed at the site shall include a copy of the original report(s) upon which the summaries are based. Attachment A and the sensitivity analysis (see comment 3, above) were omitted from the 26 June 2001 submittal and should have included to facilitate NJDEP review.

9. **Department Oversight and Notarized Certifications**

Pursuant to the Rules for Department Oversight of the Remediation of Contaminated Sites, N.J.A.C. 7:26C-1.2, the notarized certification for a corporation must be from a principal executive officer of at least the level of vice president or a duly authorized representative of that person. BI comply with the provisions of N.J.A.C. 7:26C-1.2 and N.J.A.C. 7:26E-1.5 with regard to all documents submitted for NJDEP review pursuant to the referenced MOA.

In addition, the Department has identified that the referenced MOA provides for NJDEP oversight and cost reimbursement up to the remedial design phase. Although the MOA currently establishes NJDEP oversight for the remediation of the PKP and the other areas of concern (AOCs) at the site, it does not provide for NJDEP oversight of the remedial action phase. Fortunately, BI has not ventured beyond the remedial design phase for any of the AOCs at the site. However, to remedy this situation and provide for uninterrupted NJDEP oversight for the remediation of this site, BI must submit a notarized letter requesting that the MOA be amended to provide for NJDEP oversight of the remedial action phase. The notarized letter must also confirm that BI shall reimburse the NJDEP for all oversight costs incurred by the Department.

If you have any questions, please contact me at (609) 633-0739 or via email at *mkenney@dep.state.nj.us*.

Sincerely,

Michael S. Kenney, Case Manager
Bureau of Case Management

c: James Monkowski, Bayonne Health Department
Andrew Cozzi, Bluestone Environmental Services, LLC
Mary Hrenda, BGWPA
John Boyer, BEERA
Mark Walters, BCM
Gwen Zervas, BCM

BAYONNE INDUSTRIES, INC.

FOOT OF EAST 22ND STREET P.O. BOX 67 BAYONNE, NEW JERSEY 07002

PHONE: (201) 437-2200

Michael S. Kenney, Case Manager
Bureau of Case Management
401 East State Street
P.O. Box 028
Trenton, NJ 08625-0028

March 19, 2002
Project:IMT01PND

FILE COPY

Re: In the Matter of the Bayonne Industries Site and Bayonne Industries, Inc.
City of Bayonne, Hudson County, New Jersey
Contaminated Site List No. NJD064288855
Memorandum of Agreement (MOA) dated 27 May 1992
Response to comments NJDEP letter dated March 7, 2002

Dear Mr. Kenney:

This letter is in response to the Department's March 7, 2002 comment letter regarding BI's June 26, 2001 Technical Memorandum supporting incorporation of sheet pile containment wall around the Platty Kill Pond. The Department states that BI has not established that the sheet pile containment wall will provide a tight seal with the confining clay layer and therefore has placed several restrictions regarding the method of installation. BI has reviewed the Department's comments with our Structural Engineer and has determined that it is not advisable to install a sheet pile containment wall in accordance with the Department's restrictions.

It is BI's intent to provide a closure remedy that adequately addresses the Department's technical concerns as well as being the best available technical technology for closure of the Platty Kill Pond. Provided below is an alternative approach for containment of treated sludge inside the Platty Kill Pond that BI believes is consistent with similar projects that have been approved by the Department. BI has visited two of these projects sites subsequent to our June 2001 submittal and believe this alternative approach addresses the Department's concern regarding formation of a tight barrier seal.

Alternate Containment Plan:

BI proposes to replace the sheet pile containment wall with a slurry containment wall placed against the existing timber bulkhead. The slurry containment wall will be keyed two feet into the underlying clay layer and will be installed after the sludge in the Platty Kill Pond had been stabilized. The sludge will be stabilized with a new mix that will provide sufficient strength to allow construction equipment to operate from inside the PKP. The slurry wall and underlying clay will provide the necessary impermeability ($1x10^{-7}$ cm/sec) to develop containment.

A dewatering sump and monitoring piezometer will be added to the design to confirm that the groundwater flow gradient is toward the Platty Kill Pond. The alternative mix will be designed to allow for the dewatering.

It is BI's position that the presence of the clay till has been sufficiently confirmed to support this approach at over 15 locations within the PKP (using a vibrocore). However, four confirmatory borings will be installed outside the perimeter of the existing timber bulkhead as part of this modified approach. These locations and a Revised Remedial Action Work Plan for this proposed alternative approach will be developed upon receipt of the Departments concurrence of this alternative barrier approach.

We would appreciate you contacting us to schedule a meeting to discuss this change in approach.

Sincerely,

BAYONNE INDUSTRIES, INC.

Richard R. Fisette
Terminal Manager

cc: Gwen Zervas, NJDEP, BCM
Rusty Walker, IMTT
George Bress, IMTT
Andrew Cozzi, Bluestone

BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.
33 North River Street
Millstone, New Jersey 08844
908-431- 9700 / 908-431-9722 fax
web: www.bluestonecorp.net

FILE

July 9, 2002

Project:IMT01PND

Michael S. Kenney, Case Manager
Bureau of Case Management
401 East State Street
P.O. Box 028
Trenton, NJ 08625-0028

Re: In the Matter of the Bayonne Industries Site and Bayonne Industries, Inc.
City of Bayonne, Hudson County, New Jersey
Contaminated Site List No. NJD064288855
Memorandum of Agreement (MOA) dated 27 May 1992

Dear Mr. Kenney:

On behalf of Bayonne Industries Inc. (BI), we are pleased to provide results of the work necessary to fulfill the requests associated with the Remedial Action Work Plan (RAWP) conditional approval for the closure of the Platty Kill Pond (PKP). The recent work involved a confirmation that the lower clay layer extended outside and beyond the PKP wooden bulkhead boundaries and was of sufficient thickness and texture to provide an appropriate base for the closure. The clay was mutually inspected in the field by geologists from New Jersey Department of Environmental Protection (NJDEP or the Department) and Bluestone Environmental Services L.L.C. (Bluestone) for its properties related to sealing of the proposed barrier wall. Two piezometers were installed as part of the work, designed to confirm that the ground water flow gradient was flowing upward from below the clay. This information regarding vertical flow is important in that an upward flow aids in eliminating any significant potential for downward migration of contamination around the closed PKP. Finally, engineering information concerning sheet pile wall adhesion and or wall friction is provided herein in support of steel sheet pile as a secure barrier wall for the closure. BI agreed to continue to pursue the sheet pile barrier approach to closure if the findings of this additional investigation proved to confirm that the approach is sound. Based on our findings we feel that this approach remains the appropriate choice.

GEOLOGIC BORINGS

As provided in your letter of May 18, 2001 and our subsequent meeting in Trenton, soil borings have been completed around the PKP that confirm a clay bottom for the proposed closure approach. The clay has been evaluated in the field at one location jointly by our geologists and the NJDEP case geologist using plasticity tests detailed in the Bermister Soil Classification System. This field evaluation indicated that the

clay exhibits sufficient plasticity to provide for a rebound of the clay to the driven barrier wall.

Three of the soil borings intersected an underlying hardpan or gravel-till layer below the clay-till layer. Field evaluation of the properties of this underlying material, indicate that it also has a low permeability, and provides a good foundation for the low permeability clay bottom used as part of the closure.

Boring logs for the six soil borings installed around the Platty Kill Pond can be found in **Attachment A**. Soil boring SB-2R is the initial attempt for soil boring SB-2 location and was abandoned and grouted to the surface after penetrating to 20 feet below ground surface. In addition, well construction diagrams and well permits area also provided in **Attachment A**. Boring Y9-PKP-SB2 and the boring for piezometer PZ-OVB, were steel cased from the surface into the gray clay/meadow unit with 8-inch steel casing. The boring for piezometer PZ-TILL (soil boring Y9-PKP-SB3) was cased with 10-inch steel casing from the surface into the gray clay/meadow mat.

Four inch steel casing was installed from the surface into the deeper reddish-brown clay-till in borings Y9-PKP-SB1, SB2 and SB4. This clay-till would be the bottom for the proposed closure approach. Five-inch steel casing was installed in PZ-TILL (Y9-PKP-SB3) from the surface into the reddish-brown clay.

The locations of the soil borings, piezometers, and generalized soil classification cross sections are provided on **Figure 1**. **Figures 2 and 3** include cross sections A-A'-A'' and B-B', respectively. Cross Section A-A'-A'' is the west to east generalized soil classification cross-section across Platty Kill Pond and a portion of the Platty Kill Canal. The recently installed soil borings Y9-PKP-SB2, SB-2R, and SB4 are included along with soil borings and vibra-core sample data obtained previously.

Cross Section B-B' is the north to south generalized soil classification cross section across Platty Kill Pond and includes recently installed soil borings Y9-PKP-SB1 and SB3 (the boring for PZ-TILL) along with soil borings and vibra-core samples previously obtained.

VERTICAL GROUND WATER GRADIENT

In two borings on the south side of the PKP, two piezometers were installed side by side or as a "nested pair" to measure the vertical gradient (or pressure head differential) directly above and below the reddish-brown clay-till. The piezometers were constructed of a five-foot length of one-inch inside diameter PVC, 10-slot screen, and completed with a sealed solid riser to the surface. The 5-foot screened interval for the shallow piezometer (PZ-OVB) was installed just above the clay-till in the overburden sand material. The deeper piezometer (PZ-TILL) was installed inside a steel casing sealing the lower clay-till from the overburden and in the gravel-till found just below the clay-till. Both piezometers were installed inside of steel casing that was installed to the upper gray clay/meadow mat layer. The piezometer screen intervals are depicted relative to the clay on **Figure 3.**

These piezometers and a staff gage (SG-1), installed in the canal to gain pertinent tidal fluctuations, were surveyed by Borbas Surveying and Mapping L.L.C. (Borbas) of Boonton, New Jersey for both X-Y location and the PVC top of casing elevation above mean sea level. In addition, Borbas also surveyed the X-Y location and ground surface elevations for all soil borings. Automatic data loggers (Solinst Levelogger®) were used to simultaneously compare the water levels in the

piezometers installed above and below the clay-till to each other and to the water level tidal fluctuation in the Platty Kill Canal (SG-1). The graphical results of the measurements are shown on **Figures 4 and 5**. All measurements have been normalized to mean sea level using the elevations derived by the Borbas survey. As depicted in **Figure 4**, the elevation of the hydraulic piezometric surface in the deeper piezometer (PZ-TILL) under the clay, is always higher than the piezometric surface above the clay-till (PZ-OVB). This confirms that the vertical flow is upward through the clay-till and that the tide is not reversing the ground water gradient adjacent to the PKP.

INTERNAL SHEET PILE WALL FRICTION

The proposed remedial action at the PKP involves the use of a driven steel sheet pile cantilevered wall system. This wall system must support approximately 12 feet of retained earth pressure as well as hydrostatic pressures. The cantilevered sheet pile forms a perimeter barrier as well, containing the pond sediments so that the fixation process can be performed. Based on soil strength characteristics, the cantilevered wall must be driven through the confining clay-till layer below and into the glacial till for structural stability.

The following mitigating factors are presented which will substantially limit the concerns for the steel sheet pile wall to act as a conduit to vertical ground water migration. This information is provided purely from a soil/structure interaction perspective and assumes a downward gradient exists in the PKP, which is not the case.

Wall friction or adhesion occurs between various foundation materials and the surrounding soils. Empirical values for wall friction are generally used for flexible walls such as sheet piling designed with the Coulomb coefficient method. In the case of the Platty Kill Pond, the Coulomb method was used, and the flexible cantilever wall system allows for deformation to occur.

For a steel sheet pile bulkhead, wall friction develops between the sheet pile and the surrounding soil and its magnitude is estimated as a function of the soil strength properties. The result of wall friction is to reduce earth pressures acting on the wall. For cohesionless soils, the value of wall friction is taken as 0.6 to 0.8 times the angle of internal friction.

In cohesive soils, wall adhesion develops between the sheet pile and the soil and is a function of the cohesive strength of the soil. The value of adhesion varies from 0.5 to 0.7 times the unconfined shear strength of the clay. In this case, triaxial shear tests show the undrained shear strength as being approximately 1,800 psf. Therefore, the value of wall adhesion ranges between 900 to 1,260 psf. While this is only an estimate based on empirical data, there is a significant amount of shear strength between the sheet pile and the clay based on wall adhesion. This adhesion would greatly inhibit migration of contaminants along the soil/steel interface.

In addition to the pressure of adhesion between the clay and the sheet pile, there is the process of sheet pile driving which must also be considered as limiting any potential migration. The piles will be installed utilizing a vibratory type of hammer, which is extremely common for most sheet pile projects.

A vibratory hammer exerts a vertical vibration in the pile, which disturbs or "liquefies" the soil along the immediate boundary. The pile moves downward under its own weight, plus the weight of the

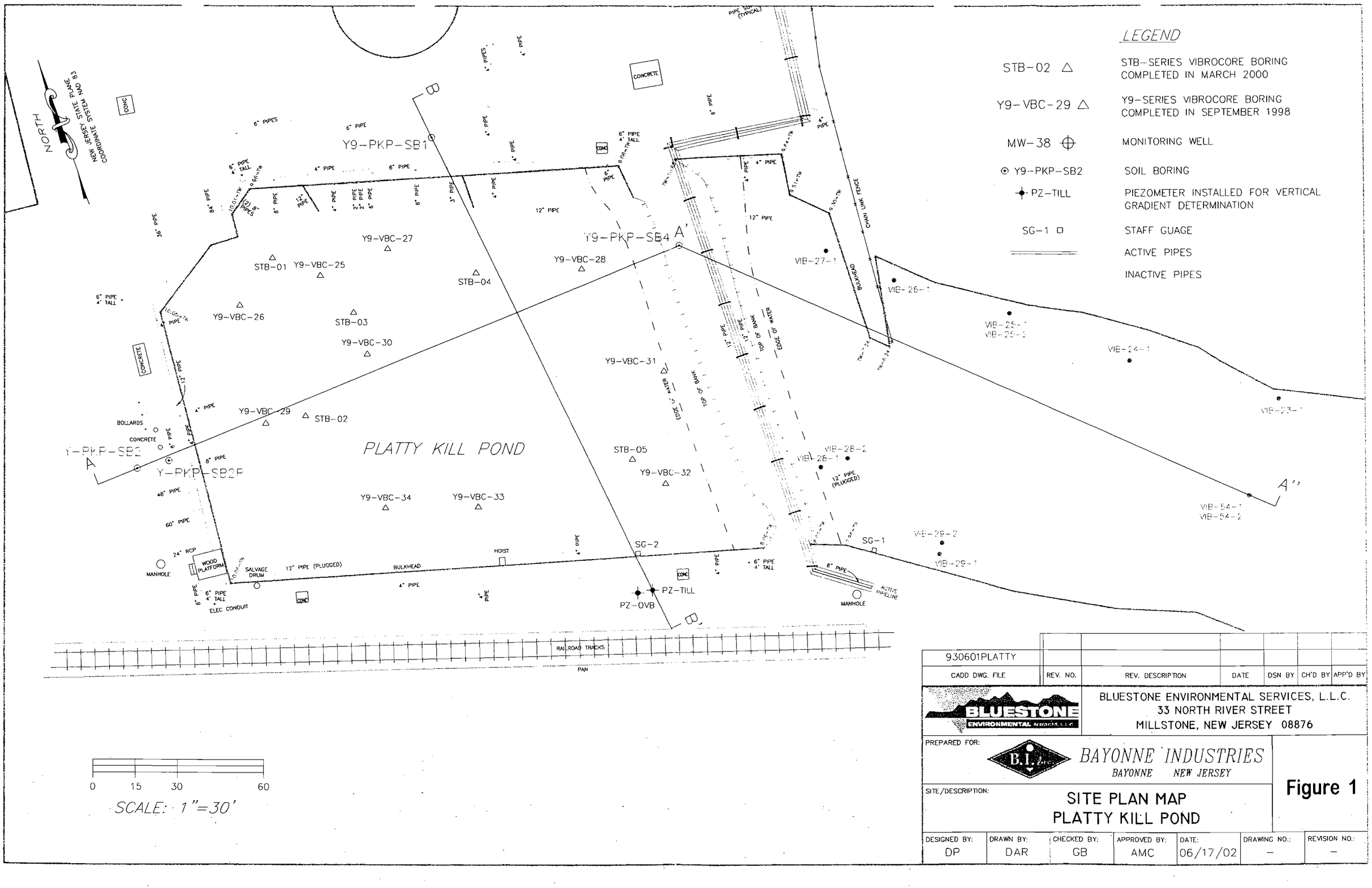
vibratory hammer. In clay soils, the hammer shears the soil from pile adhesion and allows the pile to move downward. It is believed that the vibratory process of driving sheet pile into the clay will mobilize and liquefy the sediments which are in direct contact with the sheet pile, and allow for wall friction through adhesion to immediately develop when pile driving is completed.

Based on these confirmatory findings, a Remedial Action Work Plan Addendum for the proposed approach will be developed upon receipt of the Departments concurrence. A schedule for this work is included in **Attachment B** and will be implemented upon receipt of your approval. Should you have any questions or require any additional information, please do not hesitate to contact me.

Sincerely,
BLUESTONE ENVIRONMENTAL SERVICES, LLC

Andrew M. Cozzi, CPG
Principal Geologist

Enclosures
cc: Mr. Richard Fisette
Mr. George Bress
Mr. Rusty Walker
NJDEP – 3 copies & original



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BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.
33 NORTH RIVER STREET
MILLSTONE, NEW JERSEY 08876

PREPARED FOR:
BAYONNE INDUSTRIES
BAYONNE NEW JERSEY

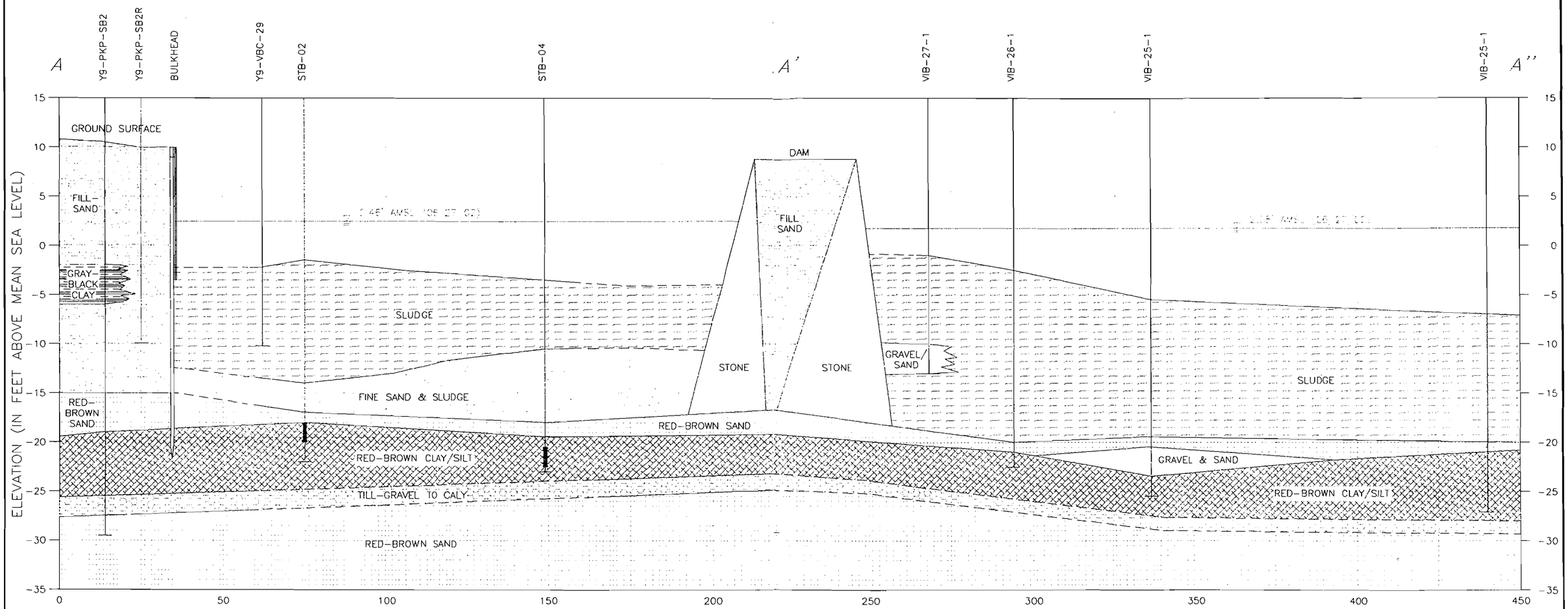
SITE/DESCRIPTION:
SITE PLAN MAP
PLATTY KILL POND

Figure 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
DP	DAR	GB	AMC	06/17/02	–	–

SECTION A-A'

SCALE : 1" = 30' H (3:1 VERT. EXAGGERATION)



LEGEND:

- FILL SAND
- GRAY/BLACK CLAY
- FINE SAND & SLUDGE
- RED/BROWN SAND
- STONE
- RED BROWN CLAY/SILT
- GRAVEL-CLAY TIL
- SLUDGE
- GRAVEL & SAND

LEGEND

VIBROCORE SAMPLE INTERVAL

I -30.0 / -32.0

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CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY

BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.
33 NORTH RIVER STREET
MILLSTONE, NEW JERSEY 08876

PREPARED FOR: BAYONNE INDUSTRIES
BAYONNE NEW JERSEY

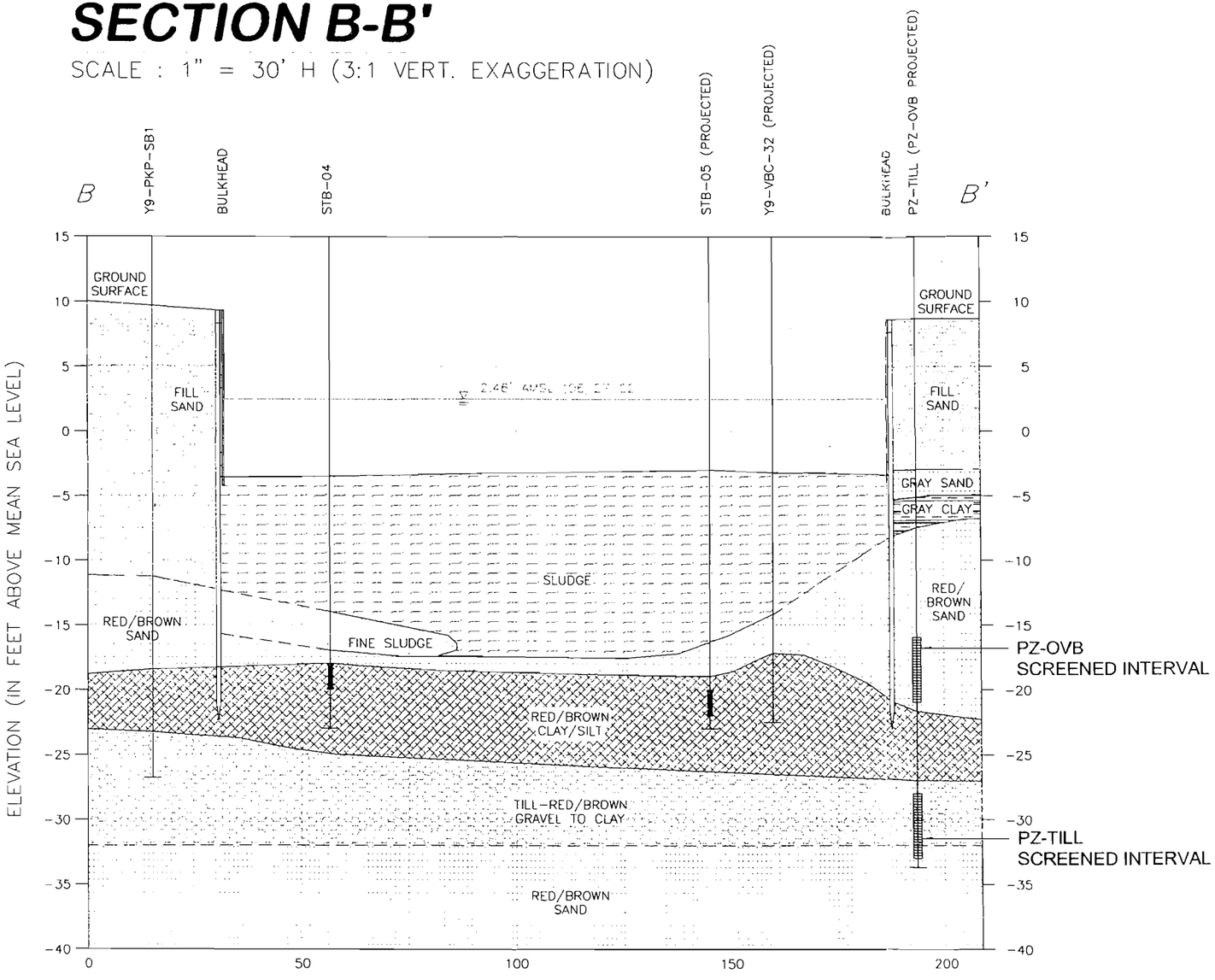
SITE/DESCRIPTION: CROSS SECTION A-A'
PLATTY KILL POND

Figure 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
DP	DP/DAR	GB	AMC	06/21/02	-	-

SECTION B-B'

SCALE : 1" = 30' H (3:1 VERT. EXAGGERATION)



LEGEND

I −30.0 / −32.0 — VIBROCORE SAMPLE INTERVAL

LEGEND:

- FILL SAND
- GRAY/BLACK CLAY
- FINE SAND & SLUDGE
- RED/BROWN SAND
- STONE
- RED BROWN CLAY/SILT
- GRAVEL-CLAY TILL
- SLUDGE
- GRAVEL & SAND

CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY
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33 NORTH RIVER STREET
MILLSTONE, NEW JERSEY 08876

PREPARED FOR: BAYONNE INDUSTRIES
BAYONNE NEW JERSEY

SITE/DESCRIPTION: CROSS SECTION B-B'
PLATTY KILL POND

Figure 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
DP	DP/DAR	GB	AMC	06/21/02	–	–

FIGURE 4
Platy Kill Pond - Piezometer Nest Comparison
May 31 to June 6, 2002

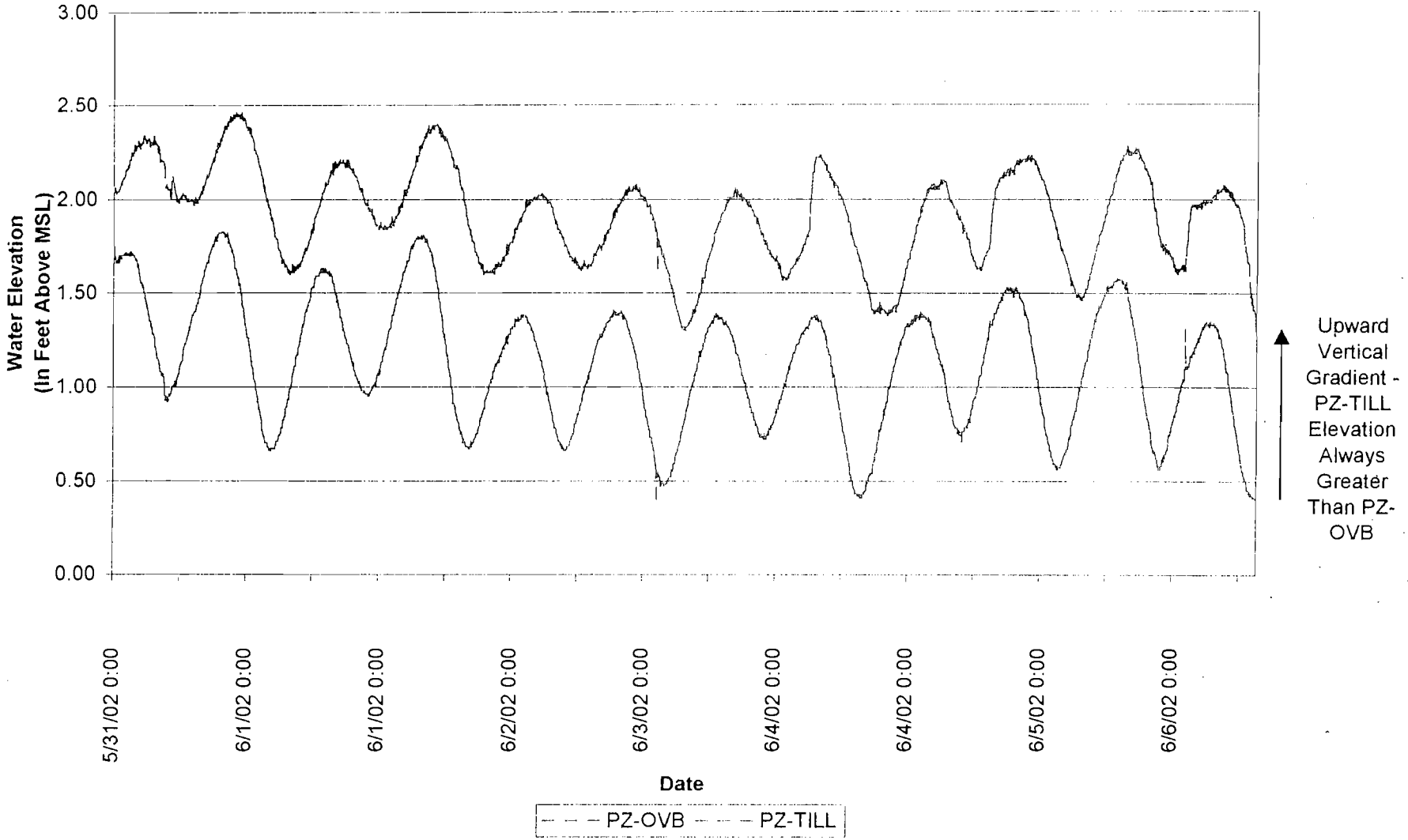
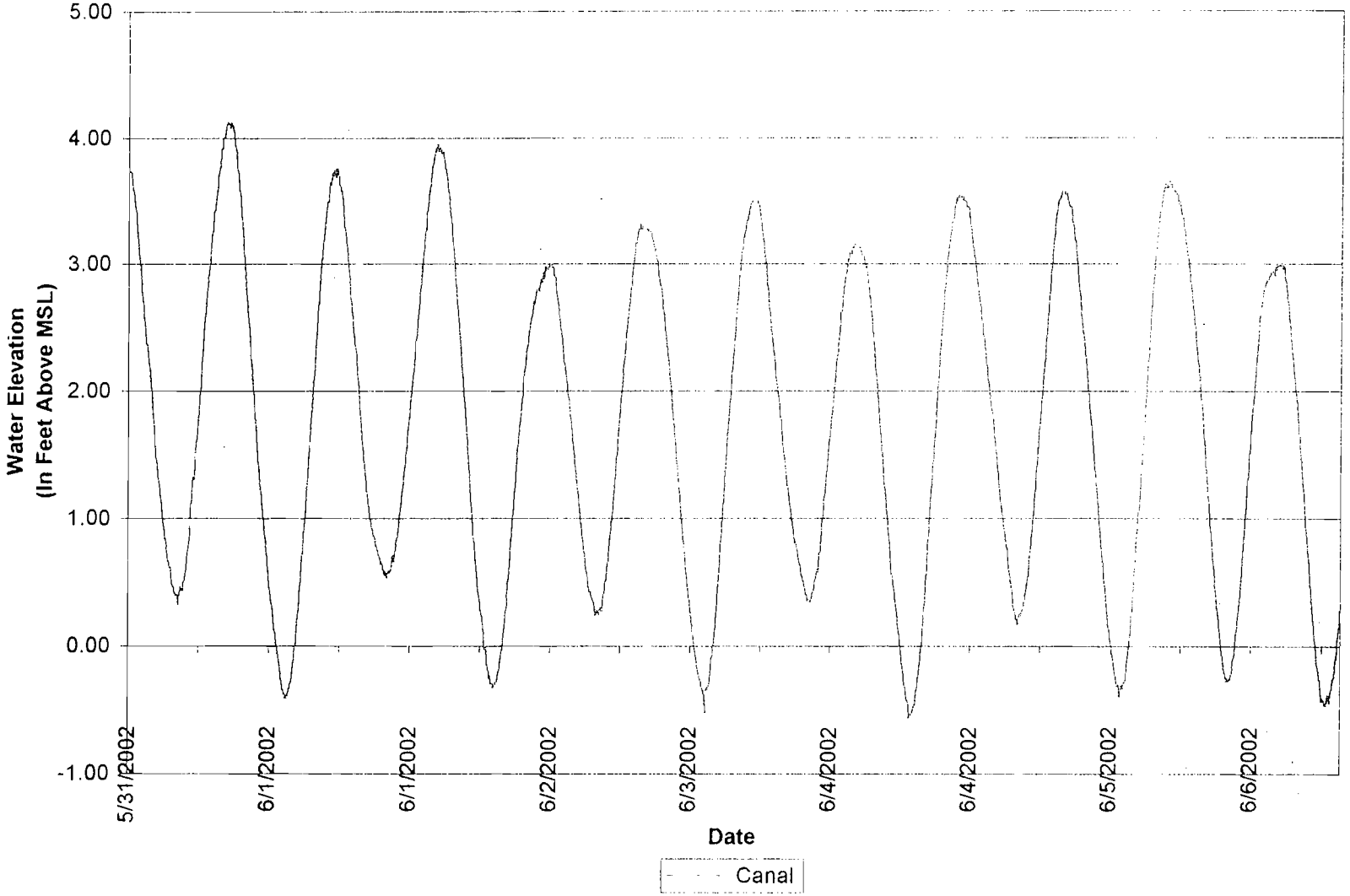
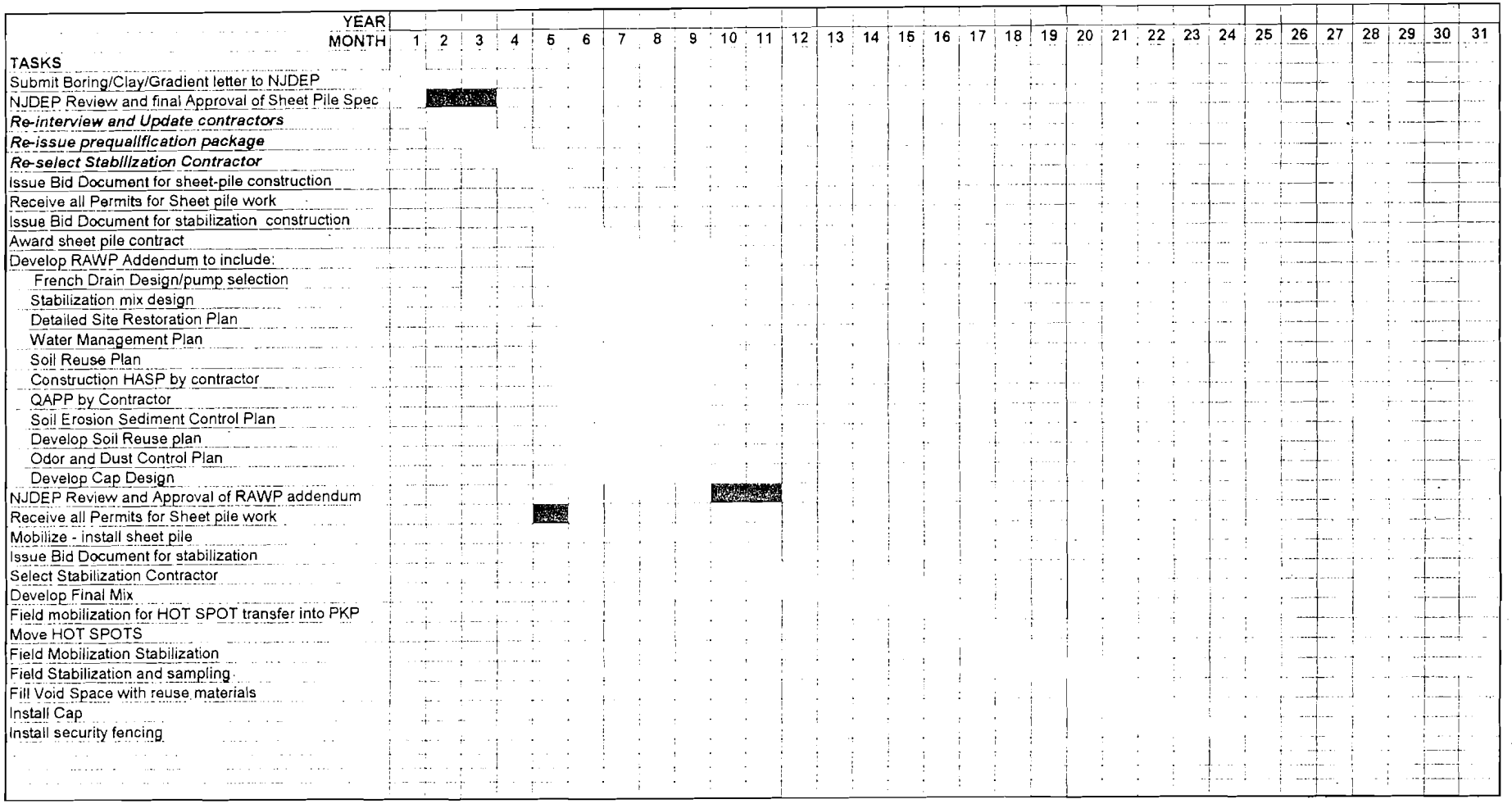


FIGURE 5
Platy Kill Pond - Canal Staff Gage
May 31 to June 6, 2002



PLATTY KILL POND
IMPLEMENTATION SCHEDULE
as of July 2002



Notes:
1. Contingent upon NJDEP approval
2. RED Cells indicate estimated NJDEP review time
3. Schedule does not include Waterfront Development Permit if recent change in NJDEP requirements are necessary

Attachment A

Soil Boring Logs, Well Construction Diagrams, Monitoring Well Records and Well Permits

IMTT – Platty Kill Pond
Bayonne, New Jersey

Letter Report - July 9, 2002

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JUL 11 1995

Bayonne Industries, Inc.

Bayonne, New Jersey

ENSR

Platty Kill Pond Bioremediation Project 1993/1994 Operating Season Report

ENSR Consulting and Engineering

July 1995

Project No. 3782-007(1)\94OPSEA\94OPSEA.RPT

Bayonne Industries, Inc.

Bayonne, New Jersey

DRAFT
Platty Kill Pond Bioremediation Project 1993/1994 Operating Season Report

ENSR Consulting and Engineering

March 1995

Project No. 3782-007(1)\94OPSEA\94OPSEA.RPT

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1.0 INTRODUCTION

This report summarizes activities associated with bioremediation of the Platty Kill Pond during the 1993 and 1994 operating seasons. Due to the New Jersey Department of Environmental Protection's (NJDEP) March 1993 request for an air permit for the bioremediation process, and delays associated with acquiring the air permit, the bioremediation system was not operated during the 1993 operating season, and was only operated for the last 78 days of the 1994 operating season (September, October and the first week of November). Activities that were conducted over the 1993 and 1994 operating seasons included:

- Re-installation of the two Framco aerators following their complete overhaul at the conclusion of the 1992 operating season;
- Installation of a new anchoring system for the aerators;
- Collection of sludge profiling data at the beginning of the 1993 operating season and at the end of the 1994 operating season;
- Removal of large obstructions from the pond that had previously impeded the movement of operating equipment within the pond;
- Collection and analysis of aqueous and sludge samples at the beginning of the 1993 operating season, and at the beginning and end of the 1994 operating season;
- Performance of an air monitoring study in accordance with a NJDEP approved air monitoring workplan; and
- Operation of the bioremediation system from August 25,1994 through November 9, 1994.

Section 2 of this report provides historical background information on the Platty Kill Pond and a brief summary of the bioremediation project. Section 3 provides a summary of 1993 and 1994 operating season activities, Section 4 provides a summary of the analytical data collected, and Section 5 provides conclusions and recommendations for continuation of the project.

2.0 BACKGROUND SUMMARY

The Bayonne Industries, Inc. site is a bulk liquid petroleum storage facility located in the Constable Hook area of Bayonne, Hudson County, New Jersey. From the 1870s to approximately 1956, the site operated as a major petroleum refinery. Refinery operations ceased in approximately 1956. From that time forward, the site operated as a bulk storage terminal. Until the mid-1950s, the Platty Kill Pond, an on-site surface impoundment, received all stormwater runoff and process water from the refinery and other tenants at the facility. When the refinery operations ceased in the mid-1950s, the only discharge from the facility to the pond was stormwater runoff. In 1978, a wastewater treatment unit was installed by Bayonne Industries to treat stormwater runoff prior to discharge to the pond. In 1986, all discharges to the pond were discontinued and re-routed to the Platty Kill Creek.

In 1989 ENSR conducted a treatability study of the sludge in the Platty Kill Pond to determine the feasibility of bioremediation as an alternative remediation technology for the pond. ENSR conducted a primary screen and a scaled-up confirmation study on the pond sludge. Results from these studies indicated that bioremediation of the pond sludge was a feasible alternative, and that a 43 percent reduction in total petroleum hydrocarbons (TPH) could be expected. Analytical results of the sludge at the completion of the study indicated that volatile and semi-volatile compounds detected in the sludge prior to initiation of the test, were not detected at the end of the test period, and that metal concentrations generally increased. Results of this study were provided to Bayonne Industries in a document titled Bioremediation Feasibility Study for the Platty Kill Pond and Wemco Lagoon, April 1989.

ENSR began bioremediation of the sludge in the pond in the fall of 1990. The system operated for approximately two months in 1990 (October-November) using two Framco aerators and an Oxygun as sources of oxygen to the pond water. In 1991 the system was operated from mid-April to the beginning of November. The short operating season in 1990 identified the need to increase the amount of sludge suspended in the water column; therefore, a sludge pump was added in August 1991 to lift and shear the sludge. In 1992, the system was operated from early June to early November. To further enhance the sludge suspension in the water column, the sludge pump was routinely moved to different locations on the pond. At the end of the 1992 operating season, the two Framco aerators were removed and overhauled by the manufacturer.

Since 1990, considerable progress has been made with the Platty Kill Pond bioremediation project to reduce the volume and contaminant concentrations in the sludge.

2.1 Sludge Volume Reduction Through 1992

Initial sludge volumes were estimated by ENSR to be approximately 6,000 yd^3 in the 1989 Biotreatment Feasibility Study that was conducted on the Platty Kill Pond. This estimation was based on sludge thickness measurements collected at six locations in the impoundment. Sludge thicknesses ranged from two to eight feet with an average thickness of approximately five feet. The average thickness was multiplied by the impoundment dimensions to arrive at the original 6,000 yd^3 volume calculation.

In 1991 depth to top of sludge measurements were collected from 15 locations on the impoundment. These measurements indicated the presence of two holes in the sludge layer in the vicinity of the two Framco aerators. These holes extended to the bottom of the impoundment, with depths measured up to 12 feet below the water surface. Depth to the top of the sludge layer in undisturbed portions of the impoundment measured approximately four feet below water surface. Based on this data the original average sludge thickness was recalculated to be approximately eight feet. The original sludge volume (1989) was thus recalculated to be 10,000 yd^3. The 1991 sludge volume was calculated to be approximately 8,300 yd^3.

In September 1992, ENSR conducted a more detailed sludge thickness profile. Using a grid system suspended over the pond, sludge thickness data were collected at 70 locations, and a sludge volume of approximately 4,600 yd^3 was calculated at the end of the 1992 operating season. The reduction in sludge volume has been estimated to be approximately 57 percent from the beginning of the project in 1990 through the 1992 operating season.

2.2 Contaminant Reduction Through 1992

To evaluate the bioremediation progress, analytical results from the composite sludge sample collected in 1989 for the bioremediation feasibility study, was initially used as the baseline contaminant concentrations. However, the NJDEP rejected this data in 1990, and required re-sampling of the pond sludge. In April 1990, five sludge samples plus a duplicate were submitted for priority pollutant volatile, semi-volatile and pesticide/PCB analysis; TCLP metals; cyanide; phenols; and total organic carbon (TOC). Results of these samples are now used as the baseline contaminant concentrations to evaluate the progress of the bioremediation. In October 1992, one composite sample was collected from the pond and submitted to the laboratory for priority pollutant volatile, semi-volatile, and metals analysis. Laboratory results from 1990 and 1992 are summarized on Table 2-1. It should be noted that the 1992 semi-volatile results, which were all non detects, were rejected by the NJDEP due to significantly elevated quantitation limits.

TABLE 2–1
Sludge Sample Comparison Summary May 1990 / October 1992
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc., Bayonne, New Jersey

	1990						1992
Compounds	IM–LS1	IM–LS11	IM–LS2	IM–LS3	IM–LS4	IM–LS5	CSS–2*
Volatile Organic Analysis							
Benzene	99	110	32	64	9.1	87	37
Chlorobenzene	2000	1500	72	84	32	240	150
Ethylbenzene	240	230	46	61	42	190	120
Toluene	570	690	250	32	1.8	570	300
Total Xylenes	810	720	67	98	20	570	410
1,1,1–Trichloroethane	---	3.1J	---	---	---	---	---
Tetrachloroethene	---	---	5.8	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	18
Semi–Volatile Organics							
1,3–Dichlorobenzene	880	840	23J	---	880	35J	**
1,4–Dichlorobenzene	1600	1500	46J	---	1600	61J	**
Hexachloroethane	1600	---	---	---	1600	---	**
1,2–Dichlorobenzene	6100	4700	22J	---	6100	110	**
Naphthalene	1500	1400	550	340	98J	620	**
Acenaphthylene	84J	100	---	200	32J	---	**
Acenaphthene	240	190	160	240	240	120	**
Fluorene	250	230	170	210	250	160	**
Phenanthrene	720	690	460	480	120	440	**
Anthracene	170	160	79J	58J	13J	67J	**
Fluoranthene	160	160	93J	46J	12J	69J	**
Pyrene	260	270	150	110	26J	150	**
Bis(2–ethylhexyl)phthalate	44J	37J	85J	210	34J	140	**
Chrysene	100	110	74J	50J	13J	66J	**
Benzo(b)fluoranthene	74J	76J	47J	74J	74J	33J	**
Benzo(a)pyrene	69J	60J	38J	69J	7.5J	33J	**
Metals							
Barium	1.4	2	1.3	1.37	1.4	1	NR
Lead	0.72	3.5	---	1.7	0.72	5.2	4400
Arsenic	---	---	---	0.25	---	2.39	390
Antimony	---	---	---	---	---	---	4.5
Beryllium	NR	NR	NR	NR	NR	NR	1.4
Cadmium	---	---	---	---	---	---	9.2
Chromium	---	---	---	---	---	---	230
Copper	NR	NR	NR	NR	NR	NR	2600
Nickel	NR	NR	NR	NR	NR	NR	36
Zinc	NR	NR	NR	NR	NR	NR	720
Cyanide	1.9	1.5	1.8	1.3	---	1.7	12
Phenols	267	232	40	42	---	51	0.42

--- Not detected.
J Estimated value, compound detected below the quantification limit. Concentration is approximate.
* CSS indicates composite sample.
** Compound not detected above practical quantitation limit.
All results expressed in parts per million (ppm).
NR – Not reported.

A TPH concentration of 230,000 parts per million (ppm) was reported in the bioremediation feasibility study sample (1989). Analysis of the samples submitted to the laboratory from the April 1990 re-sampling that the NJDEP requested, did not include TPH. Although the NJDEP has rejected the results of the 1989 feasibility study sample, the TPH concentration reported with that sample is the only analytical result avaiable as a baseline TPH concentration for purposes of evaluating the bioremediation progress. Two samples for TPH analysis were collected from the pond in June 1992, and six samples in September 1992. Results of these analyses are provided in Table 2-2. TPH concentrations averaged 160,000 ppm for the June samples and 135,000 ppm for the September samples.

TABLE 2–2
1992 Total Petroleum Hydrocarbon Concentrations
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc., Bayonne, New Jersey

Sample	Date	TPH Concentration
S–1	June 9, 1992	170,000
S–2	June 9, 1992	150,000
A–6	September 17, 1992	100,000
B–5	September 17, 1992	150,000
C–4	September 17, 1992	150,000
D–3	September 17, 1992	140,000
E–2	September 17, 1992	150,000
F–1	September 17, 1992	120,000

All values expressed in parts per million (ppm).

3.0 SUMMARY OF OPERATIONS

This section summarizes operations at the pond from April 1993 through December 1994. Activities included re-installation of the bioremediation equipment, performance of an air monitoring study, collection of sludge profiling data, collection and analysis of aqueous and sludge samples, removal of obstructions and debris from the pond, operation of the bioremediaiton system for 78 days, and daily monitoring of operations.

3.1 Re-installation of Operating Equipment

The bioremediation operating system at the Platty Kill Pond consists of five pieces of equipment:

- two Framco aerators;
- one Oxy gun aerator;
- one Crisafulli sludge pump; and
- one nutrient delivery system.

At the end of the 1992 operational season, the two 60-hp Framco aerators and their mounting platforms were removed from the pond. The two aerators were each diagnostically tested and completely overhauled by an authorized Framco dealer.

The overhauled aerators were delivered to the site in May 1993, and were mounted on newly acquired floating platforms. The floating platforms and aeration units were assembled on shore and placed into the pond via a crane.

To anchor the operational equipment, a cable system was installed around the perimeter of the pond which allows ENSR personnel to position the aerators, and any other piece of floating equipment, anywhere on the pond to within approximately 25 feet of the bulkheads.

The sludge pump is anchored and operated on a separate cable system. The cable system is anchored near each corner of the pond using a steel rod and come-a-long. One cable is stretched between the two anchors at the northwest and southwest corners of the pond, and a second cable is stretched between the anchors at the northeast and southeast corners. A third cable spans between these cables, east to west. This cable, which is threaded through a motor on the sludge pump, allows the pump to traverse the pond in an east-west direction along the cable. The come-a-longs located at each corner of the pond allow the east-west cable to move

up (north) and down (south) over the pond. This allows the sludge pump to be traversed manually in the pond in a north-south direction, in a step wise fashion.

Due to the NJDEP's request for an air permit for the bioremediation project and the associated delays in acquiring the air permit, the operational equipment was not operated during the 1993 season, and the first four months of the 1994 operating season. The system operated for 78 days in 1994.

3.2 Removal of Obstructions and Debris

To improve operating conditions in the pond, a former diversion baffle, a former pier, hoses, inactive piping and other debris were removed from the pond during the week of April 25, 1994. All debris and materials removed from the pond were staged on plastic sheeting, prior to transfer to roll-off containers for off-site disposal. The diversion baffle, pier, and other large debris and piping were removed with the aid of a clamshell equipped crane. Three 35 yd^3 roll-off containers of debris were removed from the pond.

In order to more effectively treat sludge material that had accumulated and piled at the edges of the pond, behind the former baffle, and other inaccessible areas on the pond, a clamshell equipped crane was used to move this material towards the center of the pond where it would be more accessible to the sludge pump. This effort was only moderately successful because the crane was only able to be used on the western side and northwest corner of the pond.

Following completion of the debris and obstruction removal activities, a 4-foot high polyethylene high-visibility fence was erected around the perimeter of the pond to limit access to the pond area, and to clearly mark the work zone.

3.3 Air Monitoring Study

An air monitoring work plan was submitted to the NJDEP in November 1993. This plan was in response to the agency's request for an air monitoring study while the aeration equipment was operating, as a condition of issuing an air permit. The NJDEP approved the work plan in April 1994, and allowed operation of the aeration equipment for a 14-day period to conduct the air monitoring study. The aeration equipment and sludge pump were activated on April 14, the air monitoring study was conducted on April 20, and the equipment was deactivated on April 25, 1994.

The air monitoring study was conducted using open-path Fourier-Transform Infrared (FTIR) Spectroscopy. Measurement data were collected for 15 separate 10-minute events over an

approximate 3.5 hour period. Ethylbenzene was detected in five of the 15 events; four of these detected concentrations were considered J values (estimated concentrations defined as less than twice the method detection limit [MDL]). O-xylene was also detected as a J value in one out of the 15 monitoring events. No other target compounds were detected. Emission rates were determined for ethylbenzene and o-xylene based on the actual concentrations detected. Emission rates for the remaining eight target compounds were estimated based on their respective MDLs.

These results were reported to the NJDEP in a revised air permit application dated May 14, 1994, a copy of which is included as Appendix A. Due to an error in the air monitoring instrument's software, which overestimated emission rates by a factor of three, revised emission rate calculations were submitted to the NJDEP on June 14, 1994. The approved air permit was finally received in August 1994. The air permit allowed operation of the remediation equipment for a 180-day period. Since the air permit approval process took so long, less than 90 days remained in the 1994 season; therefore, ENSR submitted a formal request to NJDEP to extend the period of operation from 180 days to 360 days, to allow for equipment operation for the remainder of the 1994 operating season and a full operating season in 1995. An extension of the operating period to 300 days was approved by the NJDEP on November 22, 1994.

3.4 Collection of Sludge Profile Data

Sludge profile data was collected in May 1993 at what was anticipated to be the beginning of the 1993 operating season, and in December 1994 at the end of the 1994 operating season. On both occasions, sludge profile data was collected employing the same method as was used at the end of the 1992 operating season. This included the use of a grid system that was suspended over the pond, and the collection of sludge thickness data at 70 locations on the pond. At each of the locations, the top of the sludge was determined using a 10-foot long, 1-inch PVC pipe which was ruled and notched at six inch intervals, with a round 1-foot diameter plate at the end. The pipe was lowered into the water-sludge mix until the plate contacted the sludge surface, at which point the depth was recorded. The approximate sludge thickness was determined by inserting a 15 foot long, 1/2-inch diameter steel rod through the PVC pipe and manually pushed through the sludge until refusal, at which point a thickness measurement was collected. All top-of-sludge measurements were referenced to a fixed point on the bulkhead to account for fluctuations in the top of the water surface. Based on the field measurements, sludge volume estimates were calculated using AutoCAD version 11.0 (1992 AutoDesk, Inc.). Sludge volume estimates are summarized in Section 4.1.

3.5 Collection of Aqueous and Sludge Samples

To monitor and evaluate the change in TPH and individual compound concentrations, aqueous and sludge samples were collected on three different occasions over the 1993 and 1994 operating seasons. The first set of samples were collected on June 8, 1993, at what was anticipated to be the beginning of the 1993 operating season, and included one aqueous sample and a duplicate, and four sludge samples and a duplicate. Since the system did not operate in 1993, no other aqueous or sludge samples were collected. The second set of samples were collected on April 27, 1994 at what was anticipated to be the beginning of the 1994 operating season, and included one aqueous sample and a duplicate, and four sludge samples and a duplicate. These samples were collected just after completion of the 14-day period allowed by NJDEP to perform the air monitoring study. The third set of samples were collected on December 14, 1994, at the end of the shortened 1994 operating season. Samples collected during this event included two aqueous samples, one at the top of the water column and one at the top of the sludge, and a duplicate, and four sludge samples and a duplicate.

Using a flat bottom boat, the aqueous samples were collected from the approximate center point of the pond, directly into the appropriate sample bottles. The sample bottles were filled by submerging them approximately two inches below the water. The aqueous sample collected from the top of the sludge layer was collected using a 1-inch diameter, stainless-steel Kemmerer sampler.

The sludge sample locations were determined by dividing the pond into four approximately equal quadrants. From the approximate mid-point of each quadrant, one sludge sample was collected. The location of each sample was identified using the same grid system used for the collection of the sludge profile measurements. The sludge samples were collected from a flat bottom boat by lowering a length of 2-inch PVC pipe through the water into the sludge at the bottom of the pond. As the pipe penetrated the sludge, a vacuum was created by raising an internal plunger equipped with a gasket at its lower tip. The PVC pipe with the sludge core inside was then removed from the water. Each core was extruded into a decontaminated stainless steel bowl, prepared in accordance with the May 1992 NJDEP Field Sampling Procedures Manual. Using a decontaminated stainless steel trowel, the sample bottles were filled by transferring sludge material from the bowl to the sample bottle. The sample bottle for volatile organic compound analyses was filled first, prior to any homogenizing of the sludge. The remaining sludge in the bowl was homogenized prior to filling the remaining sample bottles.

3.6 Daily Monitoring Operations

Following approval of the air permit in August 1994, the aeration equipment and sludge pump were activated on August 29, 1994. The system was turned off on November 8,1994. An ENSR representative monitored the bioremediation operations eight hours a day, five days a week. The monitoring included daily field testing of the pond water; weekly sampling of the pond water for laboratory analysis; and operation and maintenance of equipment, including movement of the sludge pump to suspend material in the water column.

3.6.1 Daily Monitoring

During each site visit, the ENSR representative conducted field testing of the impoundment water for pH, nitrogen measured as ammonia (NH_3), phosphate (PO_4), dissolved oxygen (DO), oxygen uptake rate (OUR), and temperature. These parameters were measured using portable pH, temperature, and dissolved oxygen meters, and calorimetric field test kits for NH_3 and PO_4. A summary and discussion of the results of these measurements is provided in Section 4.0 of this report. ENSR collected 99 sets of field test data during the shortened 1994 operating season. Field test data were collected three times per day The first set was collected upon arrival at the site, the second around mid-day, and the third just before departure from the site. Results of the field tests were used to monitor biological activity and to determine when nutrients needed to be added to the pond to enhance the bioremediation process.

The phosphate concentration was adjusted by adding 0-40-0 super triple phosphate to the pond. The goal was to maintain a PO_4 concentration of 2 ppm. However, due to heavy microbial uptake and/or precipitation, this concentration was not maintained. During the shortened September-October 1994 operating season, an average of 125 lbs per week of 0-40-0 were added to the system. A total of approximately 1,250 lbs of 0-40-0 were added to the lagoon during the 1994 season.

The nitrogen concentration was adjusted by adding urea to the lagoon, in an effort to maintain an NH_3 concentration of 50 ppm. During the shortened 1994 season the 50 ppm concentration of nitrogen could not be attained. The nitrogen content generally ranged from 10 - 18 ppm, even with the addition of significant amounts of urea. A total of approximately 800 lbs of urea were added to the pond in 1994.

Nutrient additions in 1994 were made in solution and therefore were more readily available to the biomass. Nutrient additions during past operating seasons were added in granular form, and may not have been as readily available to the biomass.

The nutrient solution was made in a 55-gallon open top steel drum with piping arranged so that water was pumped from the pond into the bottom of the drum, and overflowed back into the pond from the top. Water was drawn from the pond with a sump pump and circulated through the drum, thereby dissolving the nutrient. A 3-foot settling section in the drum (bottom to top) minimized the amount of solid nutrient carried into the pond. A nutrient increment (one half bag) was dumped into the drum and the water flow was continued until complete dissolution of the nutrient was achieved. The sump pump was turned off when there was no more solid nutrient material left in the drum. The dissolved nutrient solution was directed to the vicinity of the south Framco aeration unit, where it was picked up by the pond water circulation pattern and distributed throughout the water column.

3.6.2 Weekly Monitoring

In addition to the collection of daily field monitoring data, ENSR collected 19 sets of weekly water samples from the pond for laboratory analysis. An analytical parameter set consisted of biological oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), total suspended solids (TSS), volatile suspended solids (VSS), nitrate, ammonia, ortho-phosphate, and chloride. Results of these analyses were used to monitor the biological activity in the impoundment, and confirm field analysis. To evaluate whether analytical results from the weekly monitoring samples collected from a consistent single point along the bulkhead were providing representative results of biological activity across the pond, ENSR installed a new sampling system that was anchored at the northwest and southeast corners of the pond, and allowed for the collection of aqueous samples diagonally across the pond. Starting on October 18, 1994, and weekly thereafter, ENSR collected three aqueous samples from the pond for weekly laboratory analysis. These samples were collected from the northwest corner, the approximate mid-point, and the southeast corner of the pond. A summary and discussion of the weekly laboratory results is provided in Section 4.0 of this progress report.

3.6.3 Equipment Operation

This section summarizes operation of the various components of the operating system, including the aeration units, oxygun, and the sludge pump

3.6.3.1 Framco Aeration Units

The two Framco aeration units are located at the north and south perimeters of the pond and positioned diagonally opposite to each other. These locations promoted the maximum circulation of the pond water. At the start of the shortened 1994 operating season, the Framco unit on the north side of the pond was located in the northeast corner, and the unit on the south

side of the pond was located in the southeast corner. After approximately one month of operating (end of September), the orientation of the aeration units was reversed, with the unit on the north side being moved to the northeast corner and the unit on the south side being moved to the southwest corner. The aeration units remained in this configuration until the system was shut down on November 9, 1994.

The Framco aeration units operated continuously from August 29 through November 9, 1994. Upon arrival at the site on November 9, it was noted that the aerator on the north side of the pond was not working. It was further discovered that the pole that held the power box for the north aerator had fallen over during the night, cutting off the power supply. At that point it was decided to inactivate the entire bioremediation system for the season, because the sludge pump was also not operational at the time (see Section 3.6.3.2 below)

3.6.3.2 Sludge Pump

The sludge pump was aggressively moved on a daily basis, in both an east-west direction and a north-south direction. Because moving the sludge pump in a north-south direction must be performed manually, it was not performed as often as traversing the pond in an east-west direction, which is motorized and operated from the shore.

The sludge pump operated continuously from August 29, through October 27, 1994. Periodically upon arrival at the site, the sludge pump circuit breaker was found tripped and the pump was not working. The circuit breaker was reset on these occasions, with no problems noted. On October 27, the sludge pump discharge volume appeared to be significantly less than on previous days. ENSR personnel inspected the pump and found the screen around the impeller missing, and the impeller came off the shaft very easily. ENSR ordered the parts required to repair the pump, and the pump was removed from the pond. A delay in receiving the parts occurred because the parts had to be manufactured. When ENSR received the parts, a seasonal shutdown of the aerators had occurred due to loss of the power supply. Completion of the pump repair was put off until the beginning of the 1995 operating season.

4.0 DATA SUMMARY

This section summarizes the sludge volume estimate data; daily field monitoring data; weekly monitoring data; and aqueous and sludge sample analytical data.

4.1 Sludge Volume Estimates

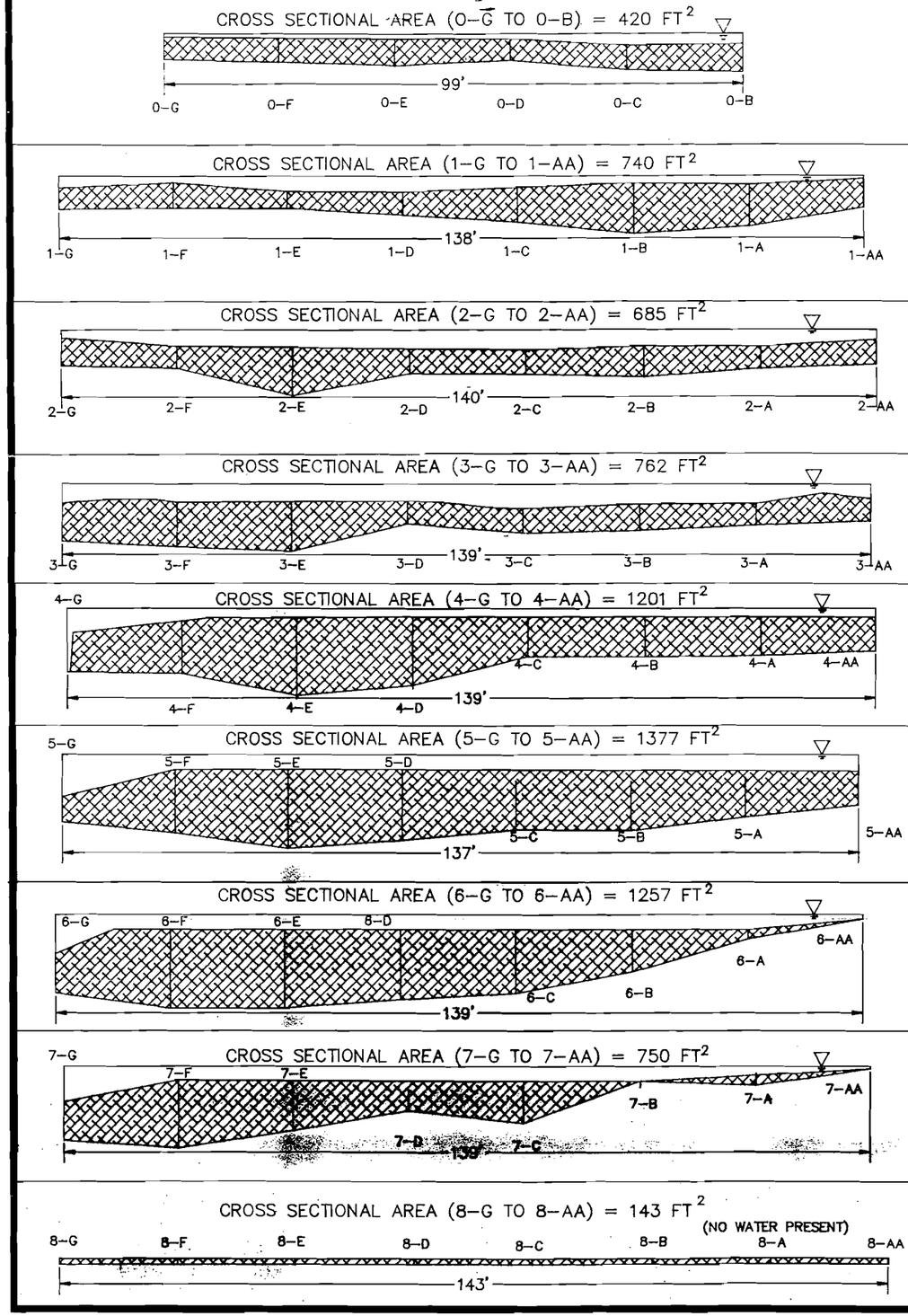
Two sets of sludge volume estimate data were collected during the 1993/1994 operating seasons. The first set of data was collected on May 4, 1993, at the anticipated beginning of the 1993 operating season. The second set of data were collected on December 22, 1994, at the end of the shortened 1994 operating season. For each measurement, sludge profile data were collected at 70 points on the pond in accordance with the method outlined in Section 3.4. Based on the field measurements, sludge volume estimates were calculated using AutoCAD version 11.0 (1992 AutoDesk, Inc.).

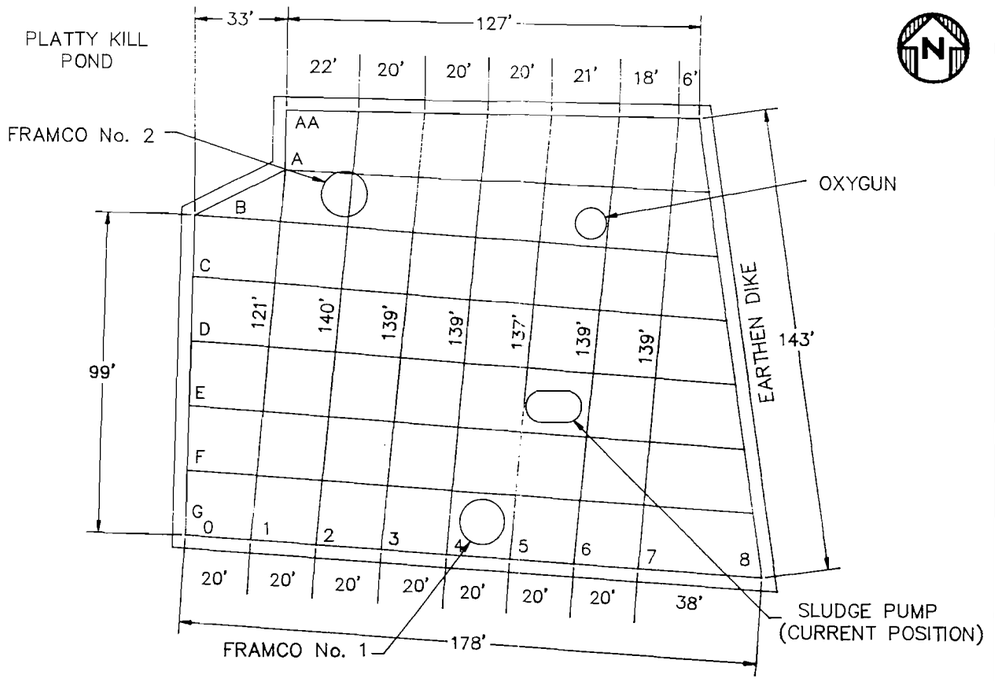
The sludge volume was estimated to be 5,400 yd^3 in April 1993, and 5,500 yd^3 in December 1994. The sludge profile data and volume calculations for April 1993 are presented on Figure 4-1; sludge profile data and volume calculations for December 1994 are presented on Figure 4-2.

There was essentially no change in sludge volume during the shortened 1994 operating season. Differences in sludge volume estimates between these results and those obtained at the end of the 1992 season, which indicated an estimated sludge volume of approximately 4,600 yd^3, are attributed to variability in the measurement techniques used. These estimates do not take into account potential "fluffing" of sludge during mixing and shearing. Sludge volume estimates should always be compared based on solids/ content and TPH content, as well as absolute volume.

Since the bioremediation system only operated for approximately two months over two operating seasons, it is not surprising that there was essentially no reduction in sludge volume, particularly since the two months that the system operated were at the end of the 1994 season, under less than optimal conditions.

The estimated sludge volume reduction since initiation of the bioremediation system in the fall of 1990 is approximately 55 percent. The estimated sludge volume reduction since 1990 is graphically presented in Figure 4-3.





CROSS SECTIONS	CROSS SECTIONAL AREA, FT²	AVERAGE CROSS SECTIONAL AREA OF ADJACENT CROSS SECTIONS, FT²		AVERAGE DISTANCE BETWEEN ADJACENT CROSS SECTIONS, FT		SLUDGE VOLUME BETWEEN ADJACENT CROSS SECTIONS, FT³
0-G TO 0-B	420	580	X	26.5	=	15,370
1-G TO 1-AA	740	671	X	21	=	14,091
2-G TO 2-AA	685	723.5	X	20	=	14,470
3-G TO 3-AA	762	981.5	X	20	=	19,630
4-G TO 4-AA	1201	1289	X	20	=	25,780
5-G TO 5-AA	1377	1317	X	20.5	=	26,998.5
6-G TO 6-AA	1257	1003.5	X	19	=	19,066.5
7-G TO 7-AA	750	446.5	X	22	=	9,923
8-G TO 8-AA	143					

TOTAL 145,329 FT.³ X 1 YD³ / 27 FT³ = 5383 YD³

7-AA ← NODE LOCATION

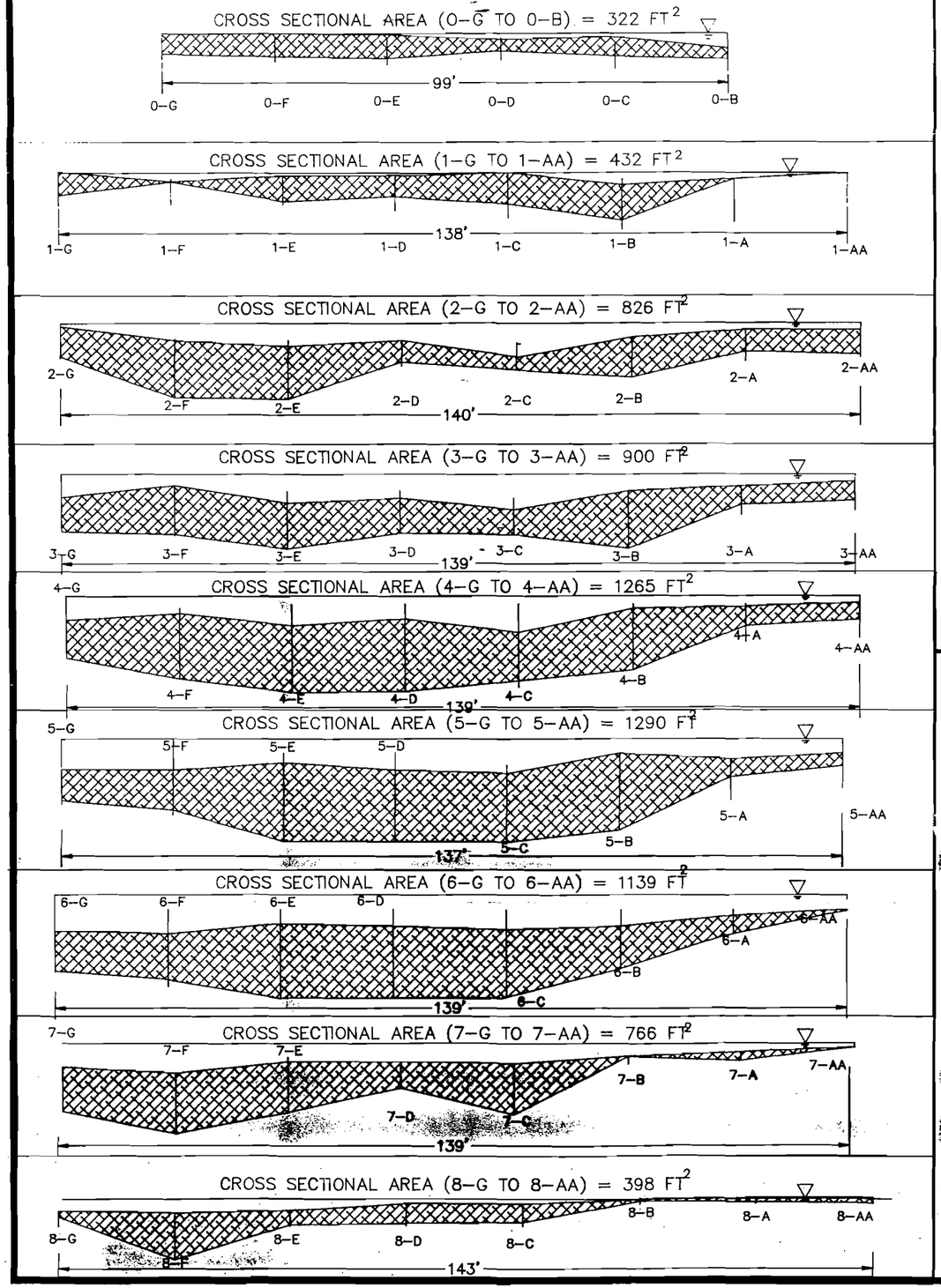
ENSR

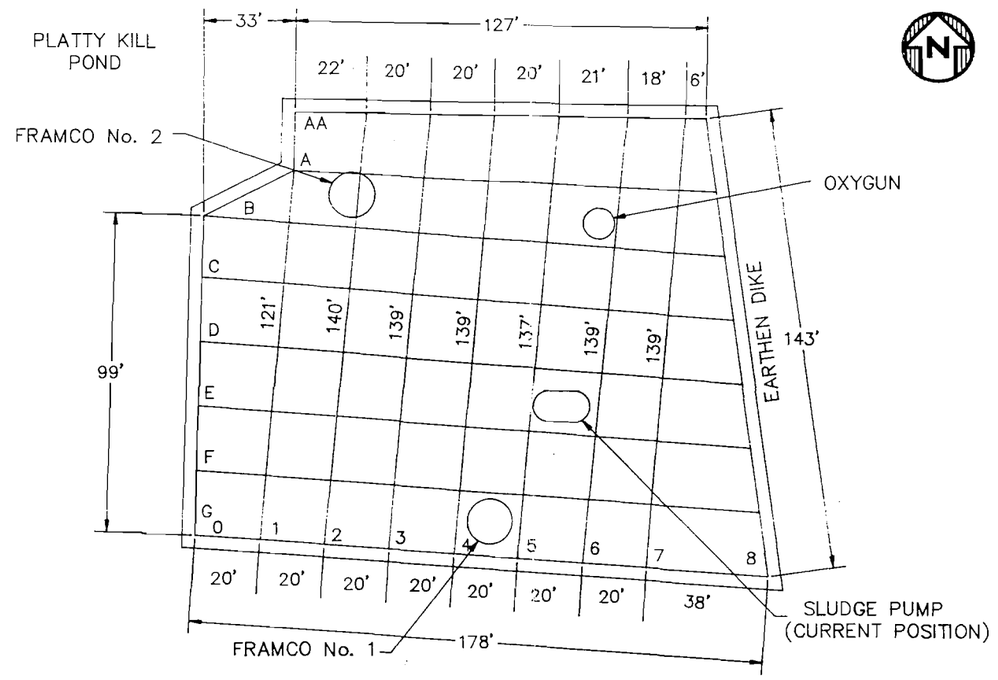
ENSR CONSULTING AND ENGINEERING

SLUDGE VOLUME ESTIMATE MAY 4, 1993

PLATTY KILL POND
BAYONNE INDUSTRIES INC., BAYONNE, N.J.

DRAWN:	DATE: AUG. 1993	FIGURE NUMBER: 4-1
APPROVED: GL	DRAWER: WLH	DRAWING NUMBER: 007D
CHECKED:	SCALE: AS NOTED	PROJECT NUMBER: 3789-007 REV. NO.





CROSS SECTIONS	AVERAGE CROSS SECTIONAL AREA, FT²	CROSS SECTIONAL AREA OF ADJACENT CROSS SECTIONS, FT²		AVERAGE DISTANCE BETWEEN ADJACENT CROSS SECTIONS, FT		SLUDGE VOLUME BETWEEN ADJACENT CROSS SECTIONS, FT³
0-G TO 0-B	322	538	X	26.5	=	14,257
1-G TO 1-AA	432	624	X	21	=	13,104
2-G TO 2-AA	826	863	X	20	=	17,260
3-G TO 3-AA	900	1082.5	X	20	=	21,650
4-G TO 4-AA	**1265**	1277.5	X	20	=	25,550
5-G TO 5-AA	1290	1239.5	X	20.5	=	25,410
6-G TO 6-AA	1139	977.5	X	19	=	18,573
7-G TO 7-AA	766	598.5	X	22	=	13,167
8-G TO 8-AA	398					

TOTAL 148971 FT.³ X 1 YD³ / 27 FT³ = 5517 YD³

7-AA — NODE LOCATION

ENSR

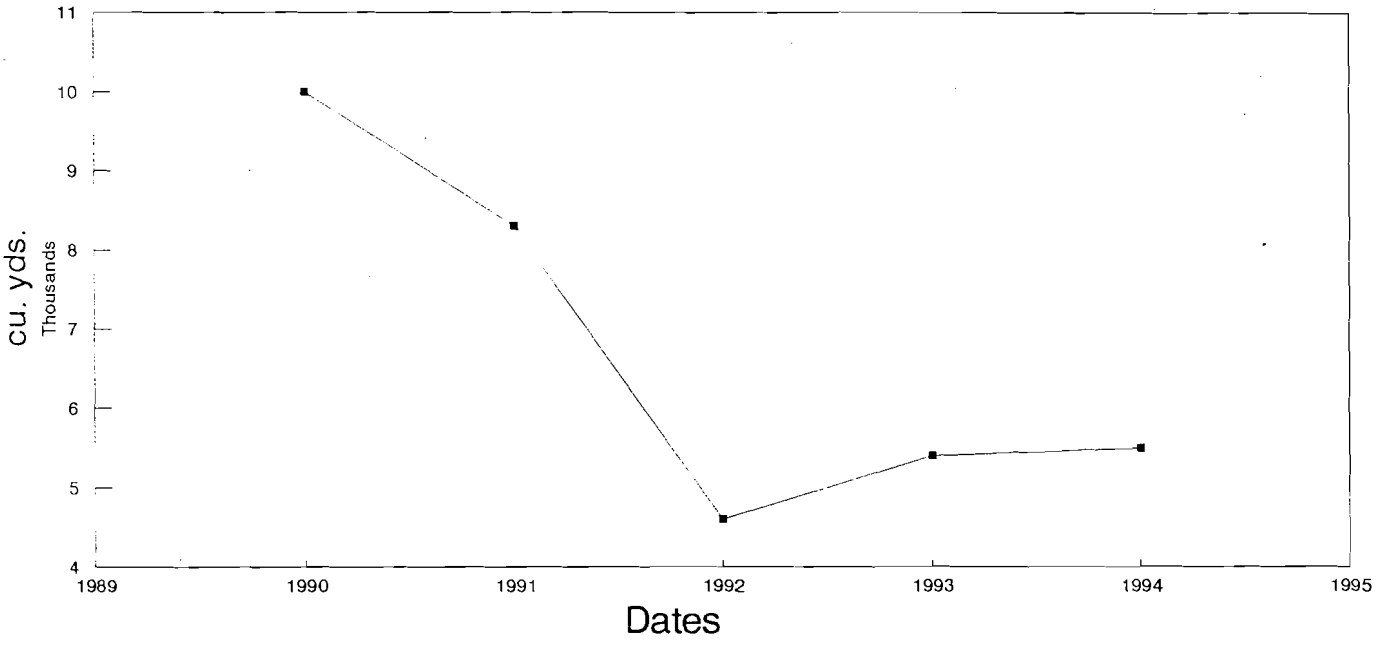
ENSR CONSULTING AND ENGINEERING

SLUDGE VOLUME ESTIMATE DEC. 22, 1994

PLATTY KILL POND
BAYONNE INDUSTRIES INC., BAYONNE, N.J.

DESIGNED	DATE: FEB. 1994	FIGURE NUMBER: 4-2	
APPROVED: DB	DRAWN: WJH	DRAWING NUMBER: 3782D007	
CHECKED: DB	SCALE: AS NOTED	PROJECT NUMBER: 3782-007-221	REV. NO.

Figure 4–3
Sludge Volume Reducton (1990–1994)
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey



4.2 Daily Field Monitoring Results

A total of 99 sets of daily field monitoring data were collected during the shortened 1994 operating season. To evaluate the effect the aggressive movement of the sludge pump had on the bioremediation system over the course of the day, three sets of aqueous samples were collected and field tested each day that ENSR personnel were on-site. Each set of samples were analyzed for pH, ammonia (NH_3), phosphate (PO_4), dissolved oxygen (DO), oxygen uptake rate (OUR), and temperature. Results of the daily testing are presented in Table 4-1.

The pH of the water remained relatively constant over the shortened operating season, without the need for chemical adjustment. Figure 4-4 graphically presents the daily pH measurements. The pH ranged from a high of 8.0 to a low of 7.1. The highest pH readings were noted at start-up through the first 20 days of operation; thereafter the pH stabilized in the 7.2 to 7.4 range for the remainder of the season. There were no notable changes in pH over the course of the operating day, as measured by the three sets of samples collected daily.

The measured DO content of the pond water was very high and fluctuated considerably over the first 27 days of operation. Figure 4-5 graphically presents the daily DO and OUR measurements. The average DO concentration averaged 10.09 mg/L for the first 27 days of operation; this value is above the saturated concentration at the measured water temperature and is likely to indicate a problem with the instrument.

At day 28, the DO content appeared to stabilize after changing the instrument membrane, and a noticeable decrease in DO content was observed for the remainder of the season, possibly indicating that the sludge was being more efficiently mixed and aerated than earlier, or the biomass activity was higher with longer operation. The average DO concentration from day 28 through day 48 was 8.26 mg/L; and 5.61 mg/L for day 49 through day 71. In general, over the course of the 8-hour operational day the DO concentration decreased, most noticeably after day 27. This pattern is expected after the generation of an active biomass attached to the sludge; as the day and season progress, the DO values drop because the culture becomes more active with increasing temperature.

The OUR values were generally lower than those observed in 1991 and 1992. The OUR is a measure of the rate at which oxygen is consumed during microbial degradation of the organic compounds in the water. The OUR generally fell into the 1 to 3 mg/L/hr range, below or at the lower end of the expected range of 2 to 5 mg/L/hr. This generally indicates that the system was not operating as effectively as it had in the past. This may have been due to the system's being idle for almost two full operating seasons. When remediation was finally re-activated at the end of the 1994 operating season, it was under less than optimal temperature conditions. The

TABLE 4-1
1994 Daily Monitoring Field Measurements
Platty Kill Pond Bioremediation Porject
Bayonne Industries, Inc.
Bayonne, New Jersey

Event	Time	Date of Sampling	pH	Water Temperature (Deg C)	Dissolved Oxygen (mg/L)	Ammonia (mg/L)	Phosphate (mg/L)	Oxygen Uptake Rate (mg/L/hr)
1	1500	9/1/94	7.3	25.8	9.48	14.0	0.6	
2	0900	9/2/94	7.2	22.8	10.72	16.0	1.0	0.25
3	1040	9/6/94	8.2	21.3	11.48	1.1	1.4	0.12
4	1500	9/6/94	8.0	22.2	11.25	1.4	1.0	0.22
5	0830	9/8/94	7.9	20.4	10.57	9.6	0.25	---
6	1130	9/8/94	7.5	21.5	9.95	11.0	0.6	0.85
7	1530	9/8/94	7.5	24.2	8.80	12.5	0.5	1.5
8	0900	9/9/94	7.5	21.7	9.57	11.0	0.24	0
9	1345	9/9/94	7.5	24.4	9.20	12.0	0.24	0
10	1530	9/9/94	7.6	24.6	9.10	10.0	0.6	1.57
11	0930	9/12/94	7.8	20.2	10.87	10.0	0.8	0
12	1245	9/12/94	7.9	21.8	10.33	10.0	0.8	0
13	0930	9/13/94	7.5	22.3	7.69	10.0	0.6	2.4
14	1400	9/13/94	7.4	23.6	7.80	11.0	0.7	2.62
15	0900	9/14/94	7.8	4.04	9.32	12.5	0.33	1.98
16	1310	9/14/94	7.8	4.04	9.15	13.1	0.58	1.99
17	1630	9/14/94	7.8	4.05	10.01	13.0	0.7	2.01
18	1000	9/16/94	7.6	22.5	9.30	11.0	0.8	---
19	1315	9/16/94	7.7	22.9	9.77	12.0	0.82	1.13
20	1550	9/16/94	7.6	22.4	8.37	13.0	0.76	1.65
21	0820	9/19/94	7.5	20.7	13.44	12.0	0.68	9.33
22	1100	9/19/94	7.7	21.9	11.42	12.0	0.6	1.58
23	1500	9/19/94	7.3	23.1	10.16	14.0	0.4	2.37
24	0900	9/20/94	7.3	20.6	9.49	13.1	1.0	5.1
25	1130	9/20/94	7.2	21.9	7.72	12.5	0.93	2.48
26	1500	9/20/94	7.3	23.5	7.20	13.5	0.8	2.1
27	1040	9/21/94	7.3	---	7.3	11.5	0.7	2.2
28	1340	9/21/94	7.3	---	7.8	12.0	0.8	2.5
29	1715	9/21/94	7.3	---	9.2	11.7	0.9	2.1
30	0845	9/22/94	7.4	22.0	10.15	12.0	0.4	1.875
31	1200	9/22/94	7.4	21.7	10.13	12.0	0.36	0.975
32	1520	9/22/94	7.4	20.3	10.29	12.5	0.81	0.825
33	1015	9/23/94	7.2	20.8	10.66	12.0	0.9	0
34	1145	9/23/94	7.2	20.5	9.86	12.5	1.0	1.05
35	1525	9/23/94	7.2	20.5	10.05	12.5	0.9	0.75
36	0900	9/26/94	7.2	21.0	11.50	15.0	1.0	---
37	1515	9/26/94	7.4	22.6	17.16	15.0	0.6	---
38	0930	9/27/94	7.2	21.6	16.70	13.0	0.3	---
39	1300	9/27/94	7.4	22.0	---	15.0	0.7	---
40	1930	9/27/94	7.3	22.5	10.62	14.0	1.2	2.32
41	0900	9/28/94	7.2	21.0	9.86	16.0	0.9	0.325
42	0900	9/28/94	7.2	22.8	8.02	16.0	0.31	1.2
43	0830	9/29/94	7.2	19.7	8.80	18.0	0.64	2.92

TABLE 4–1
1994 Daily Monitoring Field Measurements
Platty Kill Pond Bioremediation Porject
Bayonne Industries, Inc.
Bayonne, New Jersey

Event	Time	Date of Sampling	pH	Water Temperature (Deg C)	Dissolved Oxygen (mg/L)	Ammonia (mg/L)	Phosphate (mg/L)	Oxygen Uptake Rate (mg/L/hr)
1	1500	9/1/94	7.3	25.8	9.48	14.0	0.6	
2	0900	9/2/94	7.2	22.8	10.72	16.0	1.0	0.25
3	1040	9/6/94	8.2	21.3	11.48	1.1	1.4	0.12
4	1500	9/6/94	8.0	22.2	11.25	1.4	1.0	0.22
5	0830	9/8/94	7.9	20.4	10.57	9.6	0.25	---
6	1130	9/8/94	7.5	21.5	9.95	11.0	0.6	0.85
7	1530	9/8/94	7.5	24.2	8.80	12.5	0.5	1.5
8	0900	9/9/94	7.5	21.7	9.57	11.0	0.24	0
9	1345	9/9/94	7.5	24.4	9.20	12.0	0.24	0
10	1530	9/9/94	7.6	24.6	9.10	10.0	0.6	1.57
11	0930	9/12/94	7.8	20.2	10.87	10.0	0.8	0
12	1245	9/12/94	7.9	21.8	10.33	10.0	0.8	0
13	0930	9/13/94	7.5	22.3	7.69	10.0	0.6	2.4
14	1400	9/13/94	7.4	23.6	7.80	11.0	0.7	2.62
15	0900	9/14/94	7.8	4.04	9.32	12.5	0.33	1.98
16	1310	9/14/94	7.8	4.04	9.15	13.1	0.58	1.99
17	1630	9/14/94	7.8	4.05	10.01	13.0	0.7	2.01
18	1000	9/16/94	7.6	22.5	9.30	11.0	0.8	---
19	1315	9/16/94	7.7	22.9	9.77	12.0	0.82	1.13
20	1550	9/16/94	7.6	22.4	8.37	13.0	0.76	1.65
21	0820	9/19/94	7.5	20.7	13.44	12.0	0.68	9.33
22	1100	9/19/94	7.7	21.9	11.42	12.0	0.6	1.58
23	1500	9/19/94	7.3	23.1	10.16	14.0	0.4	2.37
24	0900	9/20/94	7.3	20.6	9.49	13.1	1.0	5.1
25	1130	9/20/94	7.2	21.9	7.72	12.5	0.93	2.48
26	1500	9/20/94	7.3	23.5	7.20	13.5	0.8	2.1
27	1040	9/21/94	7.3	---	7.3	11.5	0.7	2.2
28	1340	9/21/94	7.3	---	7.8	12.0	0.8	2.5
29	1715	9/21/94	7.3	---	9.2	11.7	0.9	2.1
30	0845	9/22/94	7.4	22.0	10.15	12.0	0.4	1.875
31	1200	9/22/94	7.4	21.7	10.13	12.0	0.36	0.975
32	1520	9/22/94	7.4	20.3	10.29	12.5	0.81	0.825
33	1015	9/23/94	7.2	20.8	10.66	12.0	0.9	0
34	1145	9/23/94	7.2	20.5	9.86	12.5	1.0	1.05
35	1525	9/23/94	7.2	20.5	10.05	12.5	0.9	0.75
36	0900	9/26/94	7.2	21.0	11.50	15.0	1.0	---
37	1515	9/26/94	7.4	22.6	17.16	15.0	0.6	---
38	0930	9/27/94	7.2	21.6	16.70	13.0	0.3	---
39	1300	9/27/94	7.4	22.0	---	15.0	0.7	---
40	1930	9/27/94	7.3	22.5	10.62	14.0	1.2	2.32
41	0900	9/28/94	7.2	21.0	9.86	16.0	0.9	0.325
42	0900	9/28/94	7.2	22.8	8.02	16.0	0.31	1.2
43	0830	9/29/94	7.2	19.7	8.80	18.0	0.64	2.92

TABLE 4-1
1994 Daily Monitoring Field Measurements
Platty Kill Pond Bioremediation Porject
Bayonne Industries, Inc.
Bayonne, New Jersey

Event	Time	Date of Sampling	pH	Water Temperature (Deg C)	Dissolved Oxygen (mg/L)	Ammonia (mg/L)	Phosphate (mg/L)	Oxygen Uptake Rate (mg/L/hr)
44	1115	9/29/94	7.2	20.1	9.40	17.1	0.42	3.22
45	1400	9/29/94	7.2	19.8	7.89	17.5	0.7	3.98
46	0900	9/30/94	7.3	18.2	9.91	16.0	0.9	1.575
47	1215	9/30/94	7.3	18.9	9.50	15.5	0.9	2.175
48	1600	9/30/94	7.2	20.3	6.70	18.0	0.68	5.475
49	0900	10/3/94	7.4	15.4	10.45	17.0	0.3	0
50	1230	10/3/94	7.3	17.4	9.88	16.8	0.76	0.9
51	1530	10/3/94	7.3	18.4	9.68	17.5	0.9	1.8
52	0900	10/4/94	7.1	15.8	9.55	14.0	0.8	1.43
53	1100	10/4/94	7.2	16.9	9.20	14.8	0.64	1.28
54	1500	10/4/94	7.2	18.8	8.76	16.4	0.78	1.35
55	0915	10/5/94	7.2	16.8	9.22	8.0	0.92	1.43
56	1115	10/5/94	7.2	18.6	8.67	14.2	0.98	1.43
57	1510	10/5/94	7.2	19.0	8.29	14.5	0.58	1.95
58	0930	10/6/94	7.2	15.7	9.23	15.8	0.16	1.13
59	1115	10/6/94	7.2	17.0	8.55	10.6	0.46	1.2
60	1410	10/6/94	7.2	18.9	7.49	13.8	0.99	1.95
61	0930	10/7/94	7.2	17.3	---	13.8	0.62	---
62	1115	10/7/94	7.2	18.1	8.60	13.3	0.76	2.18
63	1445	10/7/94	7.2	20.2	7.78	14.1	0.36	1.43
64	0915	10/10/94	7.2	18.1	8.61	10.0	0.72	0.75
65	1300	10/10/94	7.1	18.7	8.36	11.5	0.78	0.75
66	1500	10/10/94	7.1	18.9	8.09	12.0	0.88	0.675
67	0930	10/11/94	7.2	16.2	9.02	12.0	0.8	0.75
68	1145	10/11/94	7.2	17.9	8.22	11.0	0.48	1.2
69	1505	10/11/94	7.2	19.1	7.54	11.1	0.8	1.2
70	0935	10/12/94	7.2	17.2	8.24	11.8	0.9	1.72
71	1135	10/12/94	7.2	18.1	6.95	12.0	0.6	1.72
72	1500	10/12/94	7.2	19.3	5.75	12.0	0.8	1.95
73	1000	10/13/94	7.3	17.5	6.47	11.5	1.0	4.05
74	1345	10/13/94	7.3	19.1	5.81	12.0	1.0	3.15
75	1530	10/13/94	7.2	18.5	4.69	12.0	1.0	2.475
76	0905	10/14/94	7.2	17.2	7.42	14.0	0.5	5.1
77	1200	10/14/94	7.2	17.7	6.94	16.0	0.3	3.92
78	1500	10/14/94	7.2	17.9	6.54	17.0	0.7	3.7
79	1110	10/17/94	7.2	18.0	9.34	14.0	0.34	1.12
80	1305	10/17/94	7.2	19.8	8.54	14.0	0.46	1.58
81	1010	10/18/94	7.2	17.8	5.54	11.5	0.1	1.28
82	0900	10/19/94	7.2	18.3	4.78	12.1	0.18	1.95
83	1435	10/19/94	7.2	19.4	3.83	11.5	0.97	1.43
84	1605	10/19/94	7.2	19.3	3.11	12.5	0.97	2.1
85	0915	10/21/94	7.2	19.2	4.35	11.0	0.64	3.375
86	1200	10/21/94	7.2	20.3	6.00	11.0	0.612	2.475

TABLE 4–1
1994 Daily Monitoring Field Measurements
Platty Kill Pond Bioremediation Porject
Bayonne Industries, Inc.
Bayonne, New Jersey

Event	Time	Date of Sampling	pH	Water Temperature (Deg C)	Dissolved Oxygen (mg/L)	Ammonia (mg/L)	Phosphate (mg/L)	Oxygen Uptake Rate (mg/L/hr)
87	1530	10/21/94	7.3	20.3	6.25	11.0	0.62	1.125
88	0935	10/24/94	7.2	18.1	7.59	11.2	0.42	1.43
89	1205	10/24/94	7.2	18.6	6.61	11.2	0.5	1.73
90	1505	10/24/94	7.2	19.6	5.94	12.0	0.46	2.25
91	0945	10/26/94	7.2	16.0	7.13	13.0	0.46	1.05
92	1300	10/26/94	7.2	17.1	6.44	15.5	0.3	1.73
93	1100	10/27/94	7.2	16.6	6.11	17.0	0.2	2.32
97	1050	11/1/94	7.2	19.7	4.06	16.0	.025	0.9
98	0900	11/2/94	7.2	16.0	3.22	15.0	0.1	1.2
99	1015	11/2/94	7.2	16.0	5.58	16.0	0.31	0.98
100	1345	11/4/94	7.2	20.2	6.99	13.0	0.22	1.28
101	1455	11/4/94	7.2	20.3	6.94	14.1	0.12	0.75
105	1335	11/9/94	7.2	20.4	6.09	8.0	0.2	0.975

--- measurement not recorded

FIGURE 4-4 PLATTY KILL POND BIOREMEDIATION
PH FIELD RESULTS (SEPTEMBER – OCTOBER 1994)
BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY

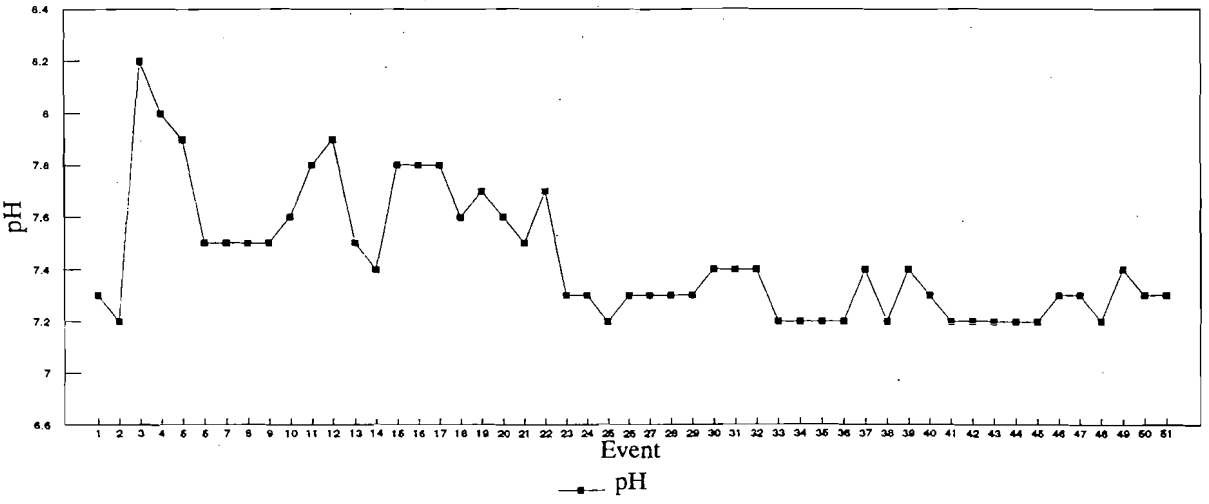


FIGURE 4-4 PLATTY KILL POND BIOREMEDIATION
PH FIELD RESULTS (OCTOBER – NOVEMBER 1994)
BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY

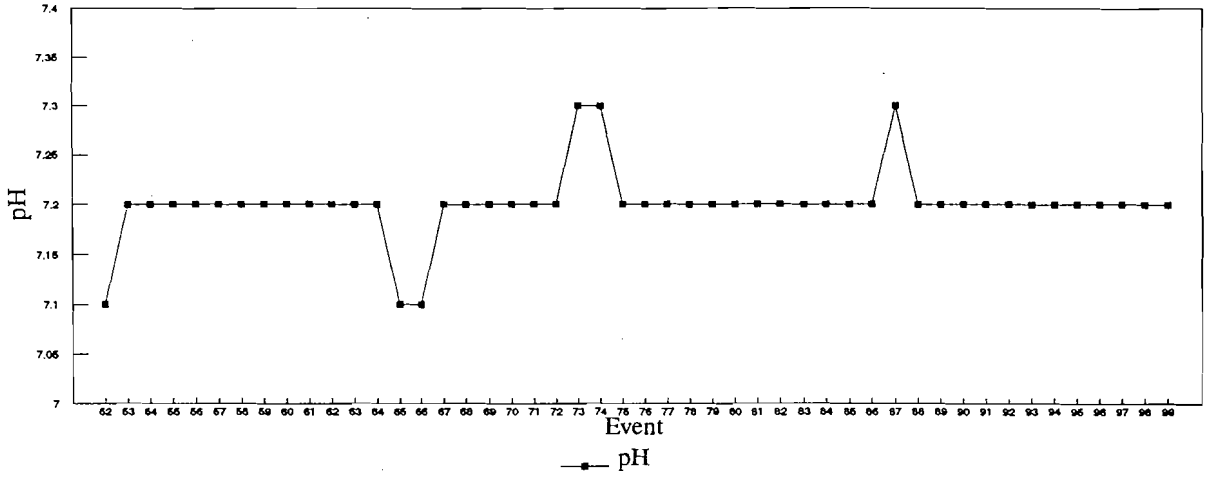


FIGURE 4-5 PLATTY KILL POND BIOREMEDIATION
DISSOLVED OXYGEN AND OXYGEN UPTAKE FIELD RESULTS (SEPTEMBER – OCTOBER 1994)
BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY

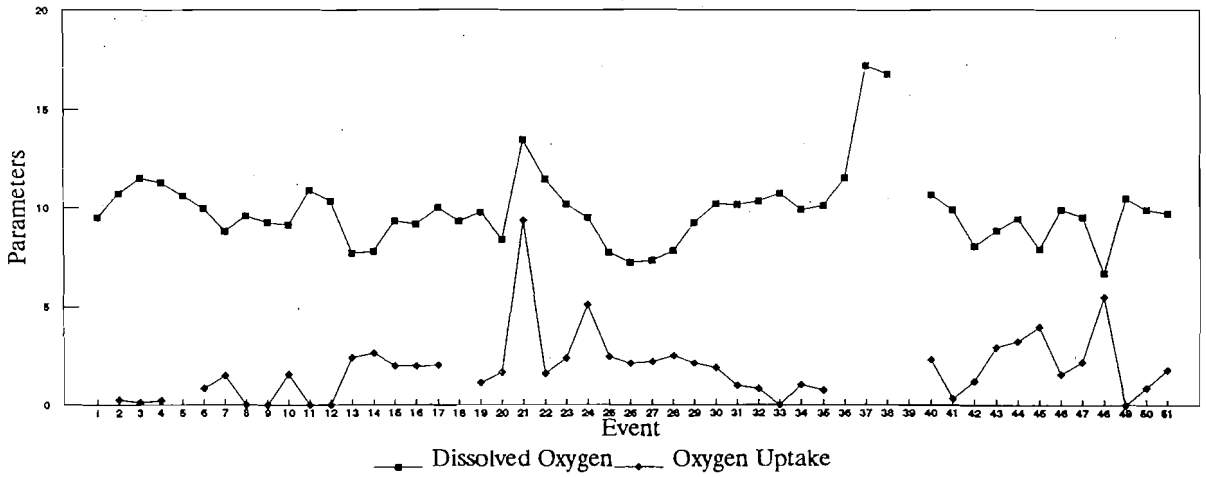
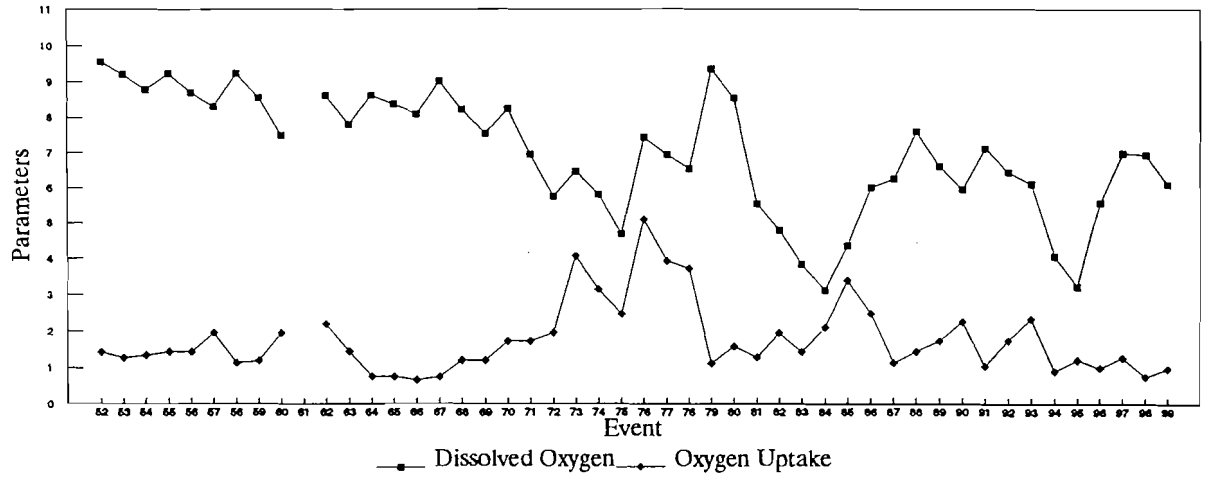


FIGURE 4-5 PLATTY KILL POND BIOREMEDIATION
DISSOLVED OXYGEN AND OXYGEN UPTAKE FIELD RESULTS (OCTOBER – NOVEMBER 1994)
BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY



observations may also have resulted from the instrument problems with the DO meter mentioned above, since a change in DO is used to determine the OUR. Notice that there appears to be an approximated inverse relationship between DO and OUR, as one might expect.

The ammonia-nitrogen levels remained fairly consistent through the 78 day operating period, ranging from a low of 1.1 mg/L to a high of 18 mg/L, with the majority falling in the 10 to 14 mg/L range. Figure 4-6 graphically presents the daily ammonia-nitrogen measurements. The target concentration of 50 mg/L could not be attained during the 78 day operating period, even with the addition of urea. This may be indicative of significant microbial activity, or significant nitrification activity. However, this conclusion appears to conflict with the OUR results. The ammonia-nitrogen field test results were noted to be consistent with the weekly laboratory results.

Historically, the addition of urea to the pond has been limited because the pond water was high in ammonia. This operating period is the first to indicate low levels of ammonia in the water, and is an indicator that the original ammonia has been converted to nitrates, dinitrogen, and/or biomass.

Phosphate levels remained low throughout the 78 day operating period, even with the addition of phosphate, never achieving the 2 mg/L goal. Figure 4-7 graphically presents the daily phosphate measurements. This is consistent with phosphate results for the 1991 and 1992 operating seasons. Daily field test results for phosphate were consistent with weekly laboratory results. There was no noticeable consistent increase or decrease in phosphate concentrations over the 8-hour operating day. It does not appear that adding the phosphate in solution rather than in granular form had any noticeable effect on the phosphate available in the water column. Prior sludge phosphate analytical results indicate that calcium precipitation competes with microbial processes to remove the phosphate from solution.

4.3 Weekly Laboratory Monitoring Results

ENSR collected 19 sets of weekly water samples for laboratory analysis, encompassing 11 weekly sampling events. An analytical parameter set consisted of biological oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), total suspended solids (TSS), volatile suspended solids (VSS), nitrate, ammonia, ortho-phosphate, and chloride. A summary of weekly laboratory results are presented in Table 4-2. Results of these analyses were used to monitor the biological activity in the pond. To evaluate whether analytical results from the weekly monitoring samples collected from a consistent single point along the bulkhead were providing representative results of biological activity across the pond, ENSR installed a new sampling system that was anchored at the northwest and southeast corners of the pond, and

FIGURE 4-6 PLATTY KILL POND BIOREMEDIATION
NITROGEN FIELD RESULTS (SEPTEMBER – OCTOBER 1994)
BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY

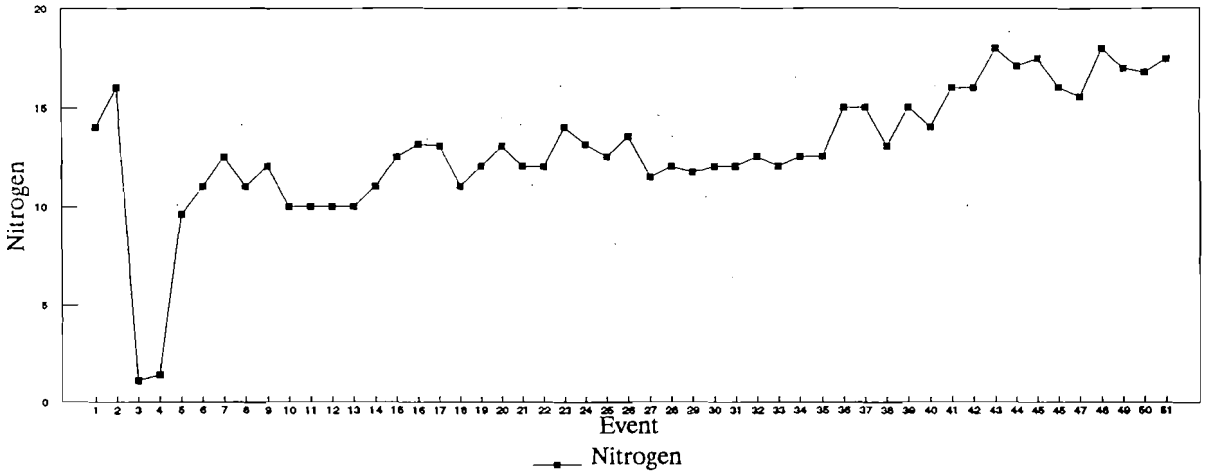


FIGURE 4-6 PLATTY KILL POND BIOREMEDIATION
NITROGEN FIELD RESULTS (OCTOBER – NOVEMBER 1994)
BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY

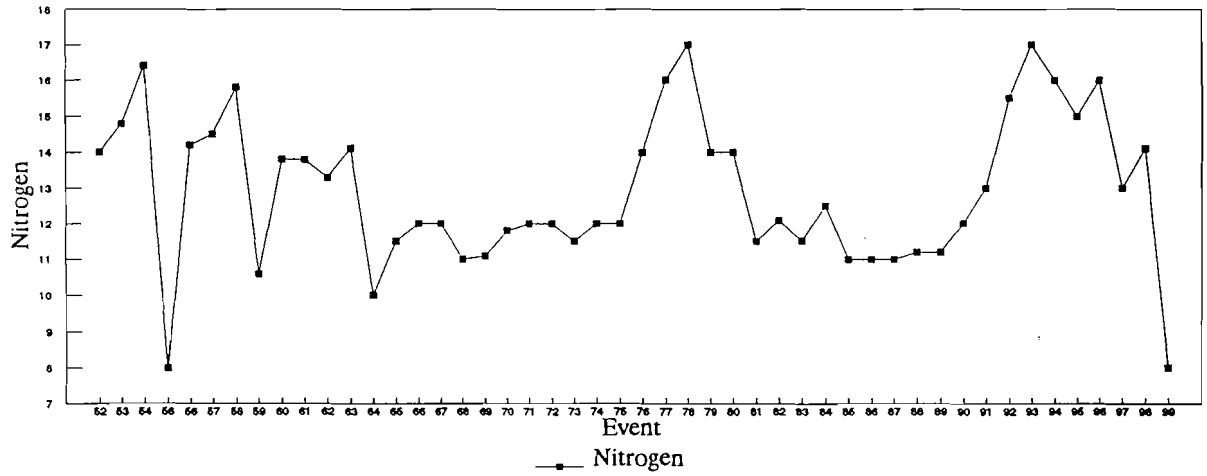


FIGURE 4-7 PLATTY KILL POND BIOREMEDIATION
PHOSPHATE FIELD RESULTS (SEPTEMBER – OCTOBER 1994)
BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY

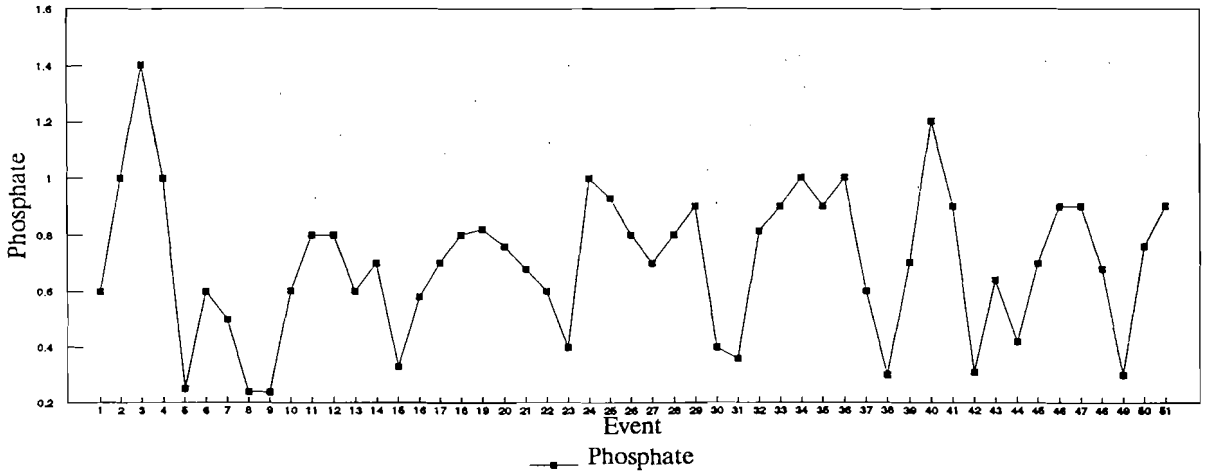


FIGURE 4-7 PLATTY KILL POND BIOREMEDIATION
PHOSPHATE FIELD RESULTS (OCTOBER – NOVEMBER 1994)
BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY

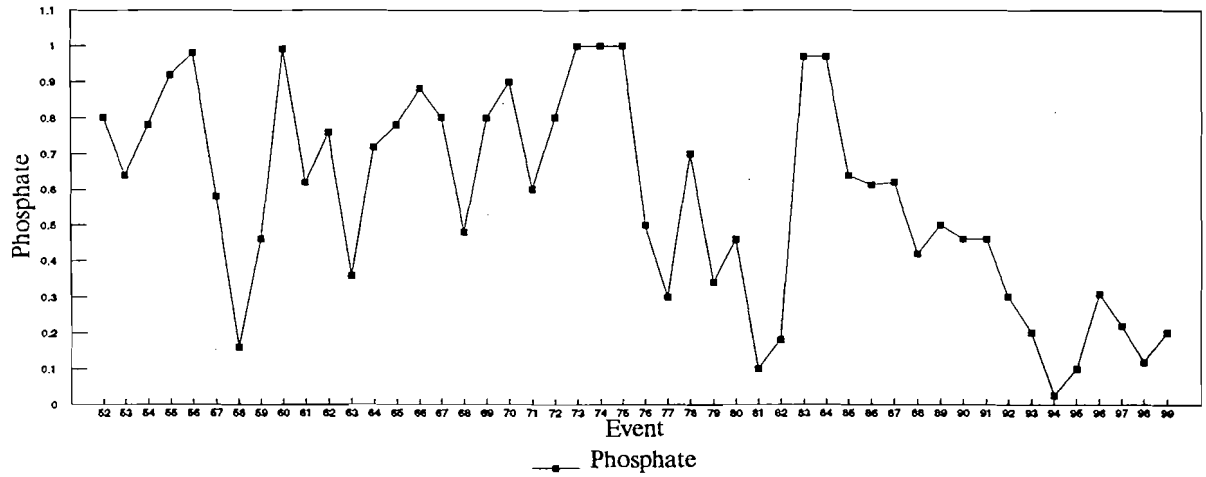


TABLE 4–2
1994 Weekly Monitoring Results
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Event	Location	Date	TSS	TDS	TOC	COD	BOD	Nitrate	Ortho–Phosphate	Amonia	Chloride
1	D	8/30/94	230	11,000	–	1,700	850	–	0.79	13	–
2	D	9/6/94	14,000	86,000	32	280	140	–	*	9.2	6,000
3	D	9/13/94	200	15,000	–	150	20	0.1	3.2	11	–
4	D	9/20/94	300	17,000	–	110	8	9.6	3.1	10	–
5	D	9/27/94	390	14,000	–	85	30	15	0.46	1.7	–
6	D	10/7/94	118	16,800	10	302	24	12	0.098	13	8,000
7	D	10/11/94	1,880	17,000	19	553	6	9.3	2.5	13	170
8	A	10/18/94	81.4	19,400	<10	225	36	3.8	0.074	11	9,000
9	B	10/18/94	830	19,700	<10	374	63	3.7	<0.050	11	11,300
10	C	10/18/94	84.4	19,500	<10	145	15	3.9	0.052	12	8,100
11	A	10/25/94	81.1	18,200	4	201	10	7.2	0.48	16	12,000
12	B	10/25/94	52.4	18,300	16	285	10	7.4	0.50	17	14,000
13	C	10/25/94	205	18,100	16	291	34	6.2	0.62	14	9,800
14	A	11/1/94	12.8	16,500	10	200	6	14	<0.05	18	8,800
15	B	11/1/94	15.3	16,700	10	163	7	15	<0.05	18	8,700
16	C	11/1/94	18.6	16,700	9	228	6	14	<0.052	18	8,600
17	A	11/8/94	33.8	18,600	7	163	7	6.7	<0.05	7.4	10,500
18	B	11/8/94	32.5	18,400	8	159	6	7.2	<0.05	7.4	12,200
19	C	11/8/94	34.3	18,600	7	159	6	7.9	<0.05	<0.2	10,100

TSS – Total Suspended Solids.
TDS – Total Dissolved Solids.
COD – Chemical Oxygen Demand.
BOD – Biochemical Oxygen Demand.
VSS – Volatile Suspended Solids.
– Not Analyzed
ND – Indicates Not Detected.
* – Sampled for Total Phosphate Not Ortho–Phosphate.
Note: All results expressed in parts per million (ppm).

allowed for the collection of aqueous samples diagonally across the pond. Starting on October 18, 1994, and weekly thereafter, ENSR collected three aqueous samples from the pond for weekly laboratory analysis. These samples were collected from the northwest corner, the approximate mid-point, and the southeast corner of the pond. The last four weekly sampling events included the collection of three water samples from across the pond.

The TSS levels varied widely over the 78 day operating period, ranging from a high of 14,000 mg/L to a low of 12.8 mg/L, but were generally at the lower end of that range. The TSS results are generally similar to those of the 1992 operating season. The lowest TSS results are for the weeks of November 1 and November 8, 1994, which corresponds to the time period when the sludge pump was inoperable. TSS results for the three samples collected across the pond for these two sampling events indicate no variation in the TSS, which was expected since the sludge pump was inoperable. For samples collected on October 18 and October 25, one of the samples each week indicated a significant increase in the TSS over the other two samples collected that day. This most likely would correspond to the proximity of the sludge pump at the time of sampling, in relation to the sample locations exhibiting the higher TSS levels.

The TDS concentrations remained fairly consistent through the 78 day operating period, ranging from a high of 86,000(once) to a low of 11,000 mg/L (once), with the majority of results falling in the 14,000 to 19,700 range. These results were consistent with TDS concentrations of 1991 and 1992. For the four days where three samples were collected across the pond, the TDS concentrations from location to location on any given day were virtually unchanged. Thes concentrations are most likely high chloride content. Future measurements should consider further partitioning analyses to determine the volatile and fixed fraction of the TDS.

COD concentrations ranged from a high of 1,700 mg/L upon system startup to a low of 85 mg/L, with the majority of results falling in the 110 to 375 mg/L range. These results are consistent with the 1991 and 1992 operating seasons. Both the COD and BOD concentrations in the Platty Kill Pond were initially elevated in the 1994 treatment. The BOD and COD concentrations declined steadily from the first week towards the end of the treatment period. These COD and BOD results are confirmed by the similarly low TOC concentrations. TOC results are a quantitation of carbon while the BOD and COD are indirect indicators of carbon based on oxygen consumption during biological or chemical oxidation. Consequently, the numbers for TOC and COD will not directly correspond but may generally correlate at a 2.4 to 2.6 times as much COD as TOC for organic constituents COD also has an inorganic component which makes direct correlation of COD with TOC difficult for mixed organic/inorganic wastes. Biological systems will usually not oxidize all of the organics and inorganics that the chemical digestion of COD methods will, particularly in the five days allowed for the BOD test with

unadapted cultures. Consequently, BODs are usually lower than CODs by a factor dependent on a variety of variables such as the type of organics, presence of oxidizable metals, inoculum, or skill in oxygen quantitation.

The high initial BODs and CODs in the weekly monitoring data (Table 4-2) are probably reflective of the initial loading from sludge mixing in combination with the low level of biological activity after a long period of inactivity. The progressive decline in both COD and BOD during the treatment is probably reflective of two factors:

- Biological activity and biomass are initially low but progressively increase in the first several weeks and perhaps throughout the treatment period, increasingly consuming the BOD and COD that is being mixed into the water from the sludge.

- Sludge shearing, mixing and suspending may not be adequate to maintain the initial high COD and BOD in the face of the increased biomass and biological activity so that BOD and COD concentrations decline and remain low until the end of the treatment season.

These results coupled with the sustained high dissolved oxygen concentrations and low OURs suggest that the system may be shearing and mixing limited; that is, not enough sludge is being sheared and suspended into the water. The limits on available COD/BOD/TOC, the "food" for the microbes, limits the metabolism of the small but developing biomass thus limiting the consumption of dissolved oxygen (low OURs) and allowing oxygen concentrations to remain high as they generally did during this short treatment period.

Additional indicators that the system may be shearing and mixing limited are the low and declining concentrations of total suspended solids (TSS). The total dissolved solids (TDS) remains high and relatively constant but is clearly mostly inorganics, such as the chloride. Notice that the TSS generally declines and more so when the shear pump is inoperable.

The ammonia concentration during remediation were due to supplementation of the nutrient-N during operations. Nitrate appears to have quickly accumulated possibly through the oxidation of ammonia. It is not surprising with the levels of ammonia and plenty of dissolved oxygen that ammonia oxidizing microbes (nitrifiers) were active. Since nitrate is also an excellent source of nutrient-N for most microbes, its production from ammonia is unlikely to have any deleterious effect unless it accumulates to very high concentrations.

The chloride concentrations in the pond are almost certainly historical from the time when the pond was hydraulically connected to the Platty Kill Canal and thus the Kill Van Kull.

4.4 Aqueous and Sludge Sample Analytical Results

ENSR collected three sets of aqueous and sludge samples during the period covered by this report. The first set of samples were collected in June 1993 at the anticipated beginning of the 1993 operating season. This set of samples included one aqueous sample plus a duplicate, and four sludge samples and a duplicate. The second set of samples were collected in May 1994 at the anticipated start of the 1994 operating season. This set of samples included one aqueous sample plus a duplicate, and four sludge samples plus a duplicate. The third set of samples were collected in December 1994 at the end of the shortened 1994 operating season. This set of samples included two aqueous samples, one at the surface and one at the top of the sludge layer, plus a duplicate, and four sludge samples plus a duplicate.

Each set of samples were analyzed for target compound list (TCL) volatile and semi-volatile organic compounds, target analyte list (TAL) metals, and TPH. The June 1993 samples were analyzed by AnalytiKEM, Inc., Cherry Hill, New Jersey, laboratory certification # 04012. The May 1994 samples were analyzed by Envirotech, Inc., Edison, New Jersey, laboratory certification # 12543. The third set of samples were analyzed by Industrial Environmental Analysts (IEA), Whippany, New Jersey, laboratory certification #14530.

All three sets of data were validated by ENSR's data validation group in Acton, Massachusetts. In general the April 1994 and the December 1994 data were found to be valid and may be used for decision making purposes. The June 1993 data was found to have significant errors; therefore, the data is presented for informational purposes only, and was not used to evaluate the progress of the bioremediation process.

Tables 4-3 and 4-4 present a summary of the TCL and TAL analytical results of the sludge and aqueous samples collected in June 1993; Tables 4-5 and 4-6 present a summary of the TCL and TAL analytical results of the aqueous and sludge samples collected in May 1994; and Tables 4-7 and 4-8 present a summary of TCL and TAL analytical results of the samples collected in December 1994. Table 4-9 presents a summary of the TPH results for all three sampling events, and Table 4-10 presents a summary of average yearly TPH concentrations from 1989 through the end of the 1994 operating season. The validated laboratory analytical sumary pages for the June 1993 results are provided in Appendix B; April 1994, Appendix C; and December 1994, Appendix D.

The TCL organic and TAL metals data indicate very little difference in individual compound concentrations from the start to the end of the 1994 operating season. This is most likely attributable to the abbreviated operating season. However, the data does indicate that there are hot spots of contamination within the sludge. As expected, sludge sample TPH concentrations

Table 4-4
June 1993 Aqueous Samples Results Summary
Paltty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organics	Sample ID	
	Y9-ESI-SW-01**	Y9-ESI-SW-02**
1,2-Dichloroethane	1.0U	0.87J
Toluene	0.40J	0.46J
Chlorobenzene	1.0U	0.30J
Semi-Volatile Organics		
2-Methylnaphthalene	10U	6.0J
Acenaphthene	10U	8.2J
Fluorene	10U	20
Phenanthrene	10U	44
Dibutyl phthalate	2.2J	10U
Fluoranthene	10U	18
Pyrene	1.7J	47
Benzo(a)anthracene	10U	14
Chrysene	10U	24
bis(2-Ethylhexyl)phthalate	10U	410
Dioctyl Phthalate	10U	19
Metals		
Aluminum	16UJ	890J
Arsenic	12	14
Barium	51.5J	51.5J
Beryllium	0.50U	0.50U
Cadmium	4.4	7
Calcium	120,000	160,000
Chromium	27.8	46.7
Cobalt	9.4J	13.2J
Copper	15.2U	224J
Iron	2.5UJ	1,510J
Lead	7.9J	270J
Magnesium	282,000J	428,000J
Manganese	184	245
Nickel	13	26.9
Potassium	102,000	130,000
Sodium	2,490,000	3,880,000J
Vanadium	3.3	13
Zinc	81J	535J

All values expressed in parts per billion (ppb).
J = Estimated value due to QC nonconformance, or values less than reporting limits.
U = Undected at the reporting limit.
** = Duplicate samples.

TABLE 4–5
April 1994 Sludge Sample Results Summary
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organics	Sample ID				
	Y9–ESI–SLU–06	Y9–ESI–SLU–07	Y9–ESI–SLU–08	Y9–ESI–SLU–09**	Y9–ESI–SLU–10**
1,2–Dichloroethane	6.2U	16	790	2.5U	2.5U
Benzene	54	14	22	32	36
Toluene	560	300	980	8.3	8.5
Chlorobenzene	4.4J	21	26	420	460
Ethylbenzene	100	60	58	52	57
Xylene (Total)	280	320	220	180	200
Semi–Volatile Organics					
4–Methylphenol	500U	7J	99U	25U	25U
1,3–Dichlorobenzene	500U	4.5J	99U	17J	17J
1,4–Dichlorobenzene	500U	8.6J	99U	28	27
1,2–Dichlorobenzene	500U	9J	99U	5.5J	5.2J
Naphthalene	1300	170	180	100	120
2–Methylnaphthalene	1400	440	770	250	280
Acenaphthylene	120J	25U	99U	25U	25U
Acenaphthene	110J	41	100	27	30
Dibenzofuran	44J	25	44J	14J	14J
Fluorene	180J	62	99	37	40
Phenanthrene	620	140	180	97	110
Anthracene	120J	35	21J	17J	20J
Carbazole	500U	39	99U	25U	25U
Di–n–butylphthalate	500U	8.9J	21J	25U	25U
Fluoranthene	150J	30	8J	19J	23J
Pyrene	330J	45	21J	41	53
Benzo(a)anthracene	81J	18J	8.3J	14J	17J
Chrysene	70J	23J	12J	24J	33
bis(2–Ethylhexyl)phthalate	500U	60	240	200	260
Di–n–octylphthalate	500U	12J	99U	79	100
Benzo(b)fluoranthene	500U	13J	99U	7.7J	11J
Benzo(k)fluoranthene	500U	4.4J	99U	3J	4.2J
Benzo(a)pyrene	500U	16J	99U	11J	13J
Indeno(1,2,3–cd)pyrene	500U	5.6J	99U	2.8J	3.5J
Benzo(g,h,i)perylene	500U	9.7J	99U	6.2J	8.7J
Metals					
Aluminum	3170	3120	1700	4110	3780
Arsenic	288J	512J	43.2J	90.6J	80.6J
Barium	R	R	R	R	R
Beryllium	0.92	0.72	0.05	0.91	0.91
Cadmium	3.7U	3.7U	0.76	3.7U	3.7U
Calcium	8710	4800	1340	4580	4940
Chromium	140	86.3	109	90.1	98.4
Cobalt	19.6	15.8	4.9	13.5	13.5
Copper	509	1970	1190	802	1380
Iron	66900	44900	8970	65700	60900
Lead	4070	16200	1100	1540	1830
Magnesium	3180	2530	1240	3850	3740
Manganese	263	218	33.7	285	267
Mercury	1.9	1.3	1.3	1.6	1.7
Nickel	70.5	52.1	40.3	78.8	67.5
Potassium	344J	347J	379J	683J	505J
Selenium	1.2J	2.0J	0.69J	1.1J	0.96J
Silver	0.45UJ	1.2J	1.2J	0.76J	0.53
Sodium	2820J	2710J	3220J	2370J	2090J
Thallium	0.48UJ	0.16U	0.48J	0.16UJ	0.63J
Vanadium	66.4	54.8	48.7	65.5	62.1
Zinc	396	497	176	411	393

All values expressed in parts per million (ppm).
J = Estimated value due to QC nonconformance, or values less than reporting limits.
U = Undetected at reporting limit.
R = Rejected due to failure to meet QC criteria.
UJ = Undetected, the reporting limit is estimated due to QC nonconformance
** = Duplicate samples

Table 4–3
June 1993 Sludge Samples Result Summary
Platty Kill Pond Bioremediation
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organics	Sample ID				
	Y9–ESI–SLU–01**	Y9–ESI–SLU–02	Y9–ESI–SLU–03	Y9–ESI–SLU–04	Y9–ESI–SLU–05**
1,2–Dichloroethane	730	344	224	204	140
Benzene	25J	47	14J	18J	10J
Toluene	600	220	16J	14J	110
Chlorobenzene	130	350	48	200	44
Ethylbenzene	220	110	50	40	78
m–Xylene	190	140	16J	36	35
o, p–Xylene	240	130	28	58	79
Semi–Volatile Organics					
1,3–Dichlorobenzene	4.7	91	2.2J	22	4U
1,4–Dichlorobenzene	8.7	170	5.1	32	9.7
1,2–Dichlorobenzene	6.9	510	1.1J	13	4U
Naphthalene	36	590	61	510	300
2–Methylnaphthalene	650	770J	230	750J	590
Acenaphthylene	13	36	4.7UJ	3.9UJ	6.9J
Acenaphthene	61	110	10J	97	18J
Dibenzofuran	39	3.5U	5.5J	14J	11J
Fluorene	71	120	22J	28	42J
N–Nitrosodiphenylamine	4.1U	3.5UJ	4.7UJ	50J	4UJ
Phenanthrene	210	310	61J	270	230
Anthracene	43	72	7.6J	26J	32J
Fluoranthene	42	94J	14J	57J	52J
Pyrene	70	95J	15J	110J	70J
Benzo(a)anthracene	35	43J	4.6J	22J	31J
Chrysene	51	52J	9.2J	34J	44J
bis(2–Ethylhexyl)phthalate	13	22J	24J	15J	30J
Benzo(b)fluoranthene	12	19J	ND	9.3J	4UJ
Benzo(k)fluoranthene	11	30J	6.1J	17J	4UJ
Benzo(a)pyrene	23	39J	7J	24J	4UJ
Indeno(1,2,3–cd)pyrene	5.1	3.5UJ	4.7UJ	3.9UJ	4UJ
Dibenz(a,h)anthracene	2.1J	3.5UJ	4.7UJ	3.9UJ	4UJ
Benzo(g,h,i)perylene	9.9	3.5UJ	4.7UJ	3.9UJ	4UJ
Metals					
Aluminum	5,290	3,150	12,500	5,030	4,360
Arsenic	310	64	230	680	370
Barium	840	536	275	1,060	877
Beryllium	0.33	0.25	0.68	0.29	0.23
Cadmium	20.2	13.5	9.3	24.6	20.3
Calcium	200	8,740	7,650	7,810	15,900
Chromium	174	194	160	415	243
Cobalt	29.7	17.5	15.8	19.4	30.5
Copper	1,490	1,490	4,640	811	2,230
Iron	132,000	86,700	52,700	55,200	140,000
Lead	5,620	3,580	4,090	24,800	5,300
Magnesium	5,830	4,850	10,700	4,230	5,260
Manganese	589	407	205	235	543
Mercury	2.5	2.6	1.6	3.8	2.4
Nickel	96.7	95.7	155	83.3	95.9
Potassium	1,130	772	2,230	1,060	837
Selenium	1.7	2.0	1.1J	2.6	1.8
Silver	2.1J	1.3J	3.0J	1.8J	1.8J
Sodium	6,490	6,790	10,900	7,530	5,660
Vanadium	72.9	75.0	78.6	101	67.6
Zinc	835	524	670	991	796

All values expressed in parts per million (ppm).
J = Estimated value due to QC nonconformance, or values less than reporting limits.
U = Undetected at the reporting limit.
UJ = Undetected, the reporting limit is estimated due to QC nonconformance.
** = Duplicate samples

TABLE 4-6
April 1994 Aqueous Sample Results Summary
Platty kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organics	Sample ID			
	Y9-ESI-SW-03**	Y9-ESI-SW-04**	FB-1	TB-1
Methylene Chloride	1U	1U	1U	1.5
Acetone	7.1U	5U	26	5U
1,2-Dichloroethane	5.1	5.4	1U	1U
Toluene	0.7J	1U	1U	1U
Semi-Volatile Organics				
2-Methylnaphthalene	10U	0.3J	10U	NR
Phenanthrene	10U	0.5J	10U	NR
Anthracene	10U	0.6J	10U	NR
Fluoranthene	0.7J	1.2J	10U	NR
Pyrene	5.4J	7.4J	10U	NR
Benzo(a)anthracene	1.4J	2.2J	10U	NR
Chrysene	2.5J	3.4J	10U	NR
bis(2-Ethylhexyl)phthalate	47	62	10U	NR
Di-n-octylphthalate	9.7J	13	10U	NR
Benzo(b)fluoranthene	0.9J	1.4J	10U	NR
Benzo(k)fluoranthene	0.3J	10U	10U	NR
Benzo(a)pyrene	1J	1.4J	10U	NR
Metals				
Aluminum	R	R	R	NR
Antimony	8.0	5.6	3.1U	NR
Arsenic	26.6J	26.5J	2.3UJ	NR
Barium	83.5B	85.3B	0.63UB	NR
Calcium	134000	135000	72.2JB	NR
Chromium	15.2	15.6	3.9U	NR
Copper	328	348	5.3U	NR
Iron	4140	4420	20.9U	NR
Lead	R	R	R	NR
Magnesium	336000	330000	38.9UB	NR
Manganese	233	238	0.7U	NR
Mercury	0.26J	0.27J	).10U	NR
Nickel	29.6	32.4	12.7U	NR
Potassium	104000J	100000J	756UJ	NR
Silver	R	R	R	NR
Sodium	2770000J	2790000J	858UB	NR
Thallium	4.4	3.2U	1.6U	NR
Vanadium	15.7JB	17.1JB	3.9U	NR
Zinc	58.4	60.0	14.1U	NR

All values expressed in parts per billion (ppb).
J = Estimated value due to QC nonconformance, or values less than reporting limits.
B = Analyte also found in the blank (laboratory blank or field blank).
U = Undetected at reporting limit.
UJ = Undetected, the reporting limit is estimated due to QC nonconformance.
R = Rejected due to failure to meet QC criteria.
NR = Analysis not required.
** = Duplicate samples

Table 4–7
December 1994 Sludge Sample Results Summary
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organics	Sample ID				
	Y9–ESI–SLU–11	Y9–ESI–SLU–12	Y9–ESI–SLU–13	Y9–ESI–SLU–14**	Y9–ESI–SLU–15**
Acetone	21U	19U	25U	150UB	35UB
Benzene	34	20	8.5J	150	140
Chlorobenzene	250	16	18	3300	3900
Ethylbenzene	90	87	46	190	180
Methylene Chloride	11U	9.7U	13U	67U	12U
Toluene	69	8.3J	13U	160	230
Total Xylenes	260	190	19	560	640
Semi–Volatile Organics					
1,3–Dichlorobenzene	4.5J	12J	21U	18J	120
1,4–Dichlorobenzene	7.6J	20	21U	30	220
1,2–Dichlorobenzene	5.9J	5J	21U	7.5J	56J
Isophorone	17U	16U	6.3J	3.4J	100U
Naphthalene	210	61	60	93	500
2–Methylnaphthalene	250	130	130	200	420
Acenaphthylene	13J	4.2	21U	6.4J	22J
Acenaphthene	47	18	16J	27	120
Dibenzofuran	17U	5.8J	21U	8.8J	25J
2,4–Dinitrotoluene	17U	16U	21U	22U	18J
Fluorene	39	17	23	28	89J
Phenanthrene	130	50	72	89	280
Anthracene	26	9.8J	12J	17J	67J
Fluoranthene	34	10J	14J	17J	72J
Pyrene	59	26	36	40	190
Benzo(a)anthracene	21	7.5J	10J	12J	53J
Bis(2–ethylhexyl)phthalate	31B	73B	33B	100B	41JB
Di–n–octylphthalate	19	18	20J	31	60J
Chrysene	23	9.8J	14J	15J	50J
Indeno(1,2,3–cd)pyrene	4.3J	1.7J	2.6J	22U	12J
Dibenz(a,h)anthracene	17U	16U	21U	22U	100U
Benzo(g,h,i)perylene	6.4J	3J	4.6J	5.7J	16J
Benzo(b)fluoranthene	9.6J	2.2J	4.2J	5.1J	19J
Benzo(k)fluoranthene	7.6J	2.2J	3J	3.3J	17J
Benzo(a)pyrene	14J	4.1J	5.5J	6.6J	38J
Metals					
Aluminum	5430	6860	12300	9850	7150
Antimony	13.3	8.3U	14.6	12.6	10.6U
Arsenic	226B	582B	489B	335B	458B
Barium	650B	563B	447B	502B	747B
Beryllium	1.0J	0.76J	0.82J	0.85J	0.62J
Cadmium	3.8B	1.8B	3.4B	5.9B	5.3B
Calcium	18400B	8640B	9140B	8150B	15800B
Chromium	163	244	218	381	346
Cobalt	26.6	37.0	25.8	21.2	29.0
Copper	1740B	1580B	2310B	3810B	1870B
Iron	148000B	119000B	82800B	66200B	114000B
Lead	2900	7480	6120	7490	10600
Magnesium	6010B	6380B	11900B	6300B	6400B
Manganese	556B	529B	328B	268B	518B
Mercury	0.81B	1.4	3.1	1.5	1.6
Nickel	142B	130B	145B	99.8B	118B
Potassium	830	1140	2220	1440	1290
Selenium	1.9J	2.3J	3.1J	2.4J	2.4J
Silver	1.2U	1.1U	1.9	3.2	1.8
Sodium	4780B	3840B	7690B	6330B	6580B
Thallium	0.23J	0.34J	0.44J	0.54J	0.65J
Vanadium	326J	117J	128J	165J	146J
Zinc	623B	740B	590B	885B	888B

All results expressed in parts per million (ppm).
J = Estimated value due to QC nonconformance, or values less than reporting limits.
B = Analyte also found in the blank (laboratory blank or field blank).
U = Undetected at the reporting limit.
** = Duplicate samples

Table 4–8
December 1994 Aqueous Sample Results Summary
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organic Compounds	Y9–ESI–SW–05	Y9–ESI–SW–06**	Y9–ESI–SW–07**	FB12/14	TB
Acetone	50U	10U	10U	10U	10J
Benzene	25U	2	42	5U	5U
Chlorobenzene	22J	16	14	5U	5U
Ethylbenzene	25U	7	6	5U	5U
Methylene Chloride	26U	5U	5U	5U	3J
Toluene	8J	140	120	5U	5U
Total Xylenes	25U	12	10	5U	5U
Semi–Volatile Organics Compounds					
Bis(2–ethylhexyl)phthalate	0.004J	0.003J	0.002J	ND	NR
Metals					
Aluminum	731	108	82.8	32.6U	NR
Antimony	71.3	85.1	102	53U	NR
Arsenic	10.8U	7J	9.1B	1.1U	NR
Barium	35.2B	37.5B	42B	0.96U	NR
Cadmium	3.3U	3.3U	3.3U	3.3U	NR
Calcium	233000B	138000B	127000B	81.9J	NR
Chromium	9.8	7.6U	7.6U	7.6U	NR
Copper	348B	20.5B	16.1UB	3.5U	NR
Iron	7220B	933B	937B	12.5UB	NR
Lead	123	12.6	12	0.31U	NR
Magnesium	520000B	284000B	249000B	65.2UB	NR
Manganese	175	152	163	1.3U	NR
Mercury	0.20	0.20U	0.20U	0.2U	NR
Potassium	138000J	66900J	62600J	550U	NR
Selenium	27.1J	4.6B	3.8UB	0.83UB	NR
Sodium	5590000B	3060000B	2450000B	699B	NR
Vanadium	6.1J	5.24J	5.2UJ	5.2UJ	NR
Zinc	23.3UB	31.2UB	7.4UB	10.5UB	NR

All results expressed in parts per million (ppm).
J = Estimated value due to QC nonconformance, or values less than reporting limits.
B = Analyte also found in the blank (laboratory blank or field blank).
U = Undetected at the reporting limit.
UJ = Undetected, the reporting limit is estimated due to QC nonconformance.
UB = Undetected due to blank contamination.
NR – Analysis not required.
** = Duplicate samples.

Table 4-9
1993/1994 Sludge Sample TPH Results Summary
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Date	Sample ID	TPH Concentration
June 1993	Y9-ESI-SLU-01**	170,000
	Y9-ESI-SLU-02	120,000
	Y9-ESI-SLU-03	210,000
	Y9-ESI-SLU-04	190,000
	Y9-ESI-SLU-05**	170,000
	AVERAGE	**172,000**
April 1994	Y9-ESI-SLU-06	135,000
	Y9-ESI-SLU-07	113,000
	Y9-ESI-SLU-08	198,000
	Y9-ESI-SLU-09**	143,000
	Y9-ESI-SLU-10**	134,000
	AVERAGE	**144,600**
December 1994	Y9-ESI-SLU-11	41,000
	Y9-ESI-SLU-12	66,000
	Y9-ESI-SLU-13	17,000
	Y9-ESI-SLU-14**	76,000
	Y9-ESI-SLU-15**	61,000
	AVERAGE	**52,200**

All results expressed in parts per million (ppm)
** – denotes duplicate samples

Table 4–10
Average Yearly TPH Concentrations (1989–1994)
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Date	Average TPH Concentration
1989	230,000
June 1992	160,000
September 1992	135,000
June 1993	172,000
April 1994	144,600
December 1994	52,200
All concentrations are expressed in parts per million (ppm)	

in April 1994 were similar to TPH concentrations at the end of the 1992 operating season. The TPH concentrations of the sludge samples collected in December 1994, at the end of the operating season, indicate a significant reduction in TPH concentration. These results appear encouraging; however, since the system only operated for 78 days over two operating seasons under less than optimal conditions, this may not be an accurate reflection of the TPH concentration in the sludge. Daily and weekly monitoring data indicate that the system was still building biomass and that it was also shearing and mixing limited. The December 1994 TPH results may suggest an error during sample collection or with the laboratory. Results of sludge samples that will be collected at the beginning of the 1995 operating season should confirm whether the results of the December 1994 samples are anomalies or are an accurate reflection of the TPH concentrations.

4.5 Waste Characterization Sample Results

One composite sludge sample was collected from the Platty Kill Pond in December 1994, and submitted for waste classification analysis, which included toxicity characteristic leaching procedure (TCLP) volatile and semi-volatile organics, and TCLP metals. A summary of the results of these analyses are presented in Table 4-11. Results of these analyses indicate that all TCLP semi-volatile compounds and metals are below their regulatory limits. Analyses for the TCLP volatile fraction indicated the presence of 1,2-dichloroethane at a concentration of 260 mg/L which is significantly above the regulatory limit of 0.5 mg/L. 1,2-Dichloroethane was not detected in the volatile fraction of any of the five sludge samples collected and analyzed in December 1994, and was detected in one of the five sludge samples collected in April 1994. This 1,2-dichloroethane result once again suggests a laboratory or sample collection error. As a result of the high concentration of 1,2-dichloroethane the detection limits for the other TCLP volatile compounds were raised above their respective regulatory limits, with the exception of methyl ethyl ketone and chlorobenzene. Results for both of these compounds were below their regulatory limits. Results of all other TCLP volatile compounds are inconclusive because the detection levels were above their respective regulatory limits.

Table 4-11
December 1994 TCLP Sample Results Summary
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organics	PKPWC-1214	Regulatory Limits
Vinyl Chloride	<5*	0.2
1,1-Dichloroethene	<2.5*	0.7
Chloroform	<2.5	6.0
1,2-Dichloroethane	260	0.5
Methyl Ethyl Ketone	<5	200
Carbon Tetrachloride	<2.5*	1.0
Benzene	<2.5*	0.5
Tetrachloroethene	<2.5*	0.7
Trichloroethene	<2.5*	0.5
Chlorobenzene	23	100
Semi-Volatile Organics		
1,4-Dichlorobenzene	0.03J	7.5
Hexachlorothane	<0.04	3.0
Nitrobenzene	<0.04	2.0
Hexachlorobutadiene	<0.04	0.5
2,4,6-Trichlorophenol	<0.04	2.0
2,4,5-Trichlorophenol	<0.20	400
2,4-Dinitrotoluene	<0.04	0.13
Hexachlorobenzene	<0.04	0.13
Pentachlorophenol	<0.20	100
Total Cresols	0.30	200
Pyridine	<0.04	5.0
Metals		
Arsenic	1.37	5.0
Barium	5.00	100
Cadmium	<0.25	1.0
Chromium	<0.10	5.0
Lead	0.513	5.0
Mercury	<0.0002	0.2
Selenium	<0.20	1.0
Silver	<0.025	5.0

All results expressed in micrograms per liter (ug/L)
J = Result is less than the specified quantitation limit
* – Quantitation limit exceeds regulatory limit

5.0 CONCLUSIONS AND RECOMMENDATIONS

The results from the period covered in this report indicate that the bioremediation system remains capable of degrading hydrocarbons in the sludge. However, the almost two year suspension of operations due to the air permit approval process has had a negative affect on the system. The abbreviated 1994 season, under less than optimal conditions, does not appear to have furthered the bioremediation process significantly. ENSR believes that operation for an additional full season will produce an additional reduction in hydrocarbon content, but that the remediation will eventually reach a point of diminishing returns for costs. The system should be operated aggressively and early in the 1995 season to re-develop an active biomass.

There are three operating concerns for the 1995 operations:

- TPH measurements using EPA Method 418.1 will become increasingly difficult to perform as this test method is phased out. ENSR believes that the EPA proposed method 1664 should be run parallel to method 418.1 on sludge samples at the commencement of the 1995 operating season to provide a basis for comparing previous results with those obtained in the future.

- The critical issue for completion of the remediation is the ability to get access to the sludges that are within 25 feet of the bulkheads. A revised cabling system and possibly an additional piece of mixing equipment to move this sludge will be required to properly address all the sludge in the pond. If the cabling and additional mixer are not used, a boom-arm mounted centrifugal pump could be used to pump the perimeter sludge from at least two sides of the pond into the central treatment area on a monthly basis. This may be the only effective way to move this sludge without mounting a dredge in the pond.

- As described in Section 4, the system appears to be significantly shear-limited under the previous operating methodology, as evidenced by the low TSS, BOD/COD, and OUR. This problem is also likely to be partially due to the reworking of the same solid mass, since the sludge at the perimeter of the pond has not been aggressively treated.

When all of the sludge in the pond has been effectively treated, there are two operational scenarios which may be considered:

- Use the pond to treat the sludge in the Platty Kill Creek, with the same equipment already in place (with one possible addition). This procedure will present some difficult material handling problems (particularly in efficiently transferring sludge from the creek to the pond, and managing the additional water and solids in the pond), but the method would permit continued treatment without interruption for process changes.

- Relocate the existing operating equipment to the creek and commence remediation in-situ. This would be supplemented by a redesign of the system and acquisition of additional equipment. This procedure would simplify water and solids management considerably, but may require an additional round of permitting and potential electrical modifications to support the relocated equipment. This approach will also require approval by EXXON since they own half the creek.

In each case, the creek would be amenable to a similar approach as was used for the pond, and barring regulatory delays, should be completed in a considerably more expeditious fashion.

The approach to closure of the pond has been outlined in the Platty Kill Pond Closure Strategy Document, dated February 1995. The closure approach requires further discussions with Bayonne Industries prior to submittal and discussions with the NJDEP. Regardless of the closure approach selected, it is extremely important to investigate and understand the subsurface environment surrounding the pond prior to selecting the final closure approach.

ENSR recommends the following for the 1995 operating season:

- Reconfigure the sludge pump cable system to allow the sludge pump to access the areas closest to the bulkheads. Automate or semi-automate the system to allow the sludge pump to continuously traverse the pond 24-hours/day seven days/week.

- Have IMTT personnel repair the utility pole that fell down at the end of the 1994 season and restore the power to the north side aerator.

- Collect one aqueous and four sludge samples (plus duplicates) at the beginning, middle, and end of the 1995 operating season, and submit samples to the laboratory for TPH, TCL organic compounds, and TAL metals. In addition, one composite sample will be collected at the beginning of the season and one at the end of the season, and be submitted to the laboratory for TCLP organics and metals analysis. Samples will be collected using the same sampling strategy used in 1994.

- Continue the aggressive mixing approach that was implemented in 1994, until the system can be automated or semi-automated. This will include having an ENSR technician on-site eight hours a day, five days a week, to move and operate the sludge pump for more complete mixing of the sludge. Once the system can be automated, an ENSR technician will visit the site each day to monitor the system.

- Remove sludge from, and close off, the various inactive pipes that pond.

- Implement the groundwater investigation around the pond as outlined in the Platty Kill Pond Closure Strategy Document.

ENSR believes that one more full, aggressive operating season is needed to complete bioremediation of the sludge material. The proposed schedule for the 1995 Operating season is provided below.

- April 1995 - Complete repairs on sludge pump and restore electrical power to the north side aerator. Reconfigure the sludge pump cable system to allow it to access sludge material near the bulkheads. Determine the equipment needed to automate the sludge pump system. Close off inactive pipes entering the pond.

- May 1995 - Conduct baseline sludge profile and collect initial round of sludge and aqueous samples for TPH, TCL organics, TAL metals, and TCLP analysis. Activate bioremediation system.

- June 1995 - Complete automation of sludge pump system. Initiate the groundwater investigation around the pond.

- July 1995 - Conduct mid-season sludge profile, and aqueous and sludge sampling.

- October 1995 - Conduct final sludge profile, and aqueous and sludge sampling for TPH, TCL organics, TAL metals,and TCLP analysis.

- November 1995 - Equipment shutdown, decontamination and storage.

ATTACHMENT A

PLATTY KILL POND BIOREMEDIATION PROJECT SUMMARY
BAYONNE INDUSTRIES, INC.

FORM VEM-003

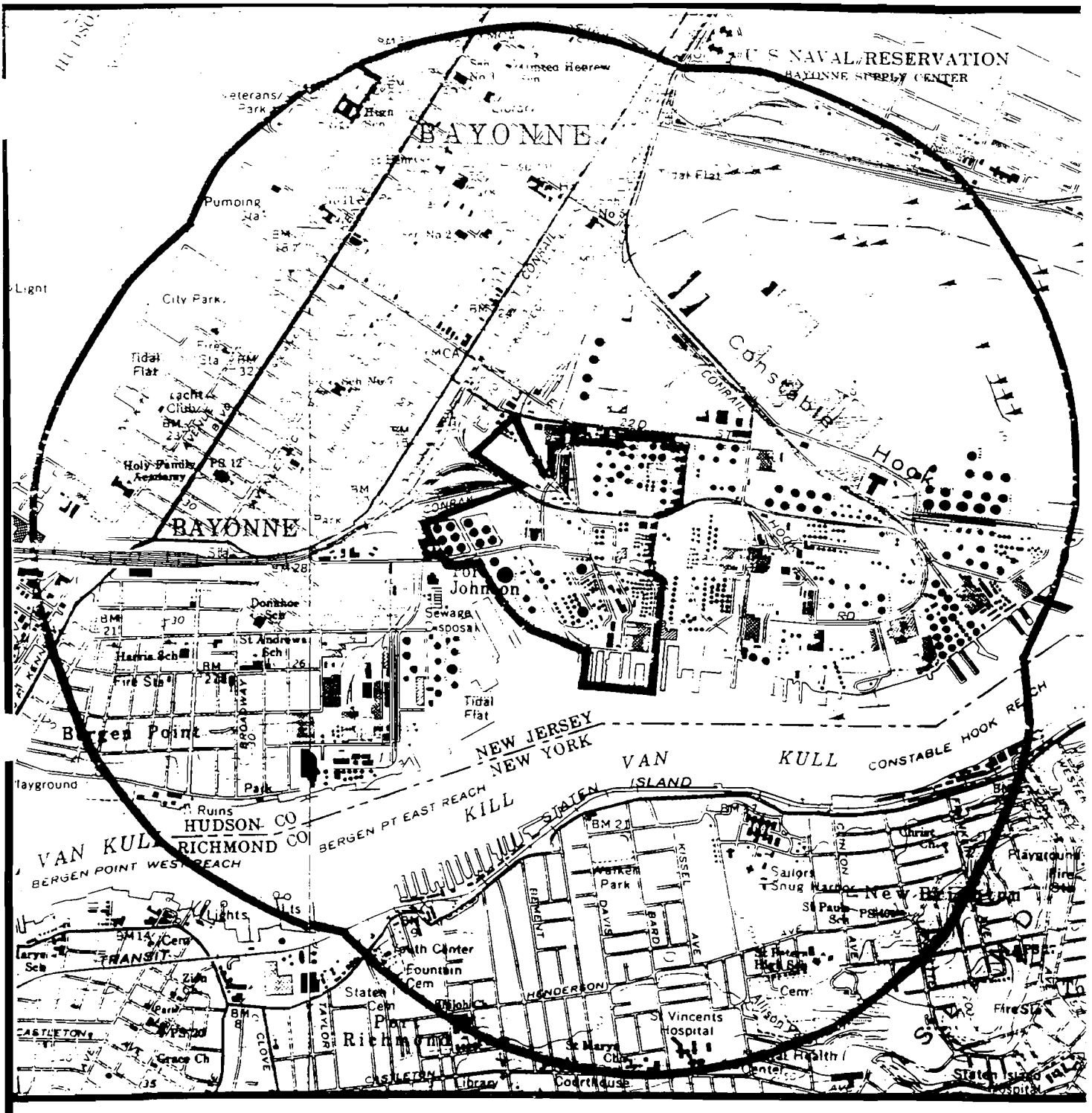
1.0 PLATTY KILL POND BIOREMEDIATION PROJECT SUMMARY

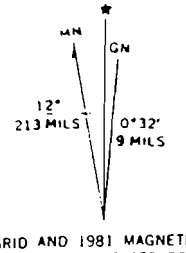
1.1 Site History

The Bayonne Industries, Inc. site is a bulk liquid petroleum storage facility located in the Constable Hook area of Bayonne, Hudson County, New Jersey. Figure 1 provides a Site Location Map, and Figure 2 provides a Site Map for the Bayonne Industries, Inc. site. From the 1870s to approximately 1956, the site operated as a major petroleum refinery. Refinery operations ceased in approximately 1956; from that time forward, the site operated as a bulk storage terminal. Twenty-eight groundwater monitoring wells have been installed on site as a requirement of Bayonne Industries' New Jersey Pollutant Discharge Elimination System (NJPDES) permit. Bayonne Industries has entered into a voluntary Memorandum of Agreement (MOA) with the NJDEPE to conduct a site-wide remedial investigation with NJDEPE oversight.

In context of the remedial investigation that is being conducted at the site, the Platty Kill Pond is located in Yard 9. Yard 9 includes the Platty Kill Pond and the Platty Kill Creek located along the southeast boundary of the property. The Platty Kill Pond location is depicted on the Yard 9 Map provided as Drawing L-6. This yard is bordered to the east by the former Exxon property, to the south by the Kill Van Kull, to the west by Yard 2, and to the north and west by Yard 3. The size of the Platty Kill Pond is approximately 140 feet wide by 250 feet long by 15 feet deep. It is enclosed by wooden bulkheads on three sides, and an earthen dike on the fourth side that separates the Platty Kill Pond from the Platty Kill Creek. The middle of the earthen dike contains an impermeable liner. The pond forms the headwaters of the Platty Kill Creek. The pond is known to contain water and petroleum sludge. Approximately 8 to 10 feet of sludge has been reported at the bottom of the pond prior to startup of bioremediation activities.

Until the mid-1950s, the Platty Kill Pond received stormwater runoff and process water from the refinery and other tenants at the facility. When the refinery operations ceased in the mid-1950s, the only discharge from the facility to the pond was stormwater runoff. In 1978, a wastewater treatment unit was installed by Bayonne Industries to treat stormwater runoff prior to discharge to the pond. In 1986, all discharges to the pond were discontinued and re-routed to the Platty Kill Creek. ENSR began bioremediation of the pond in the late summer of 1990. The progress of this program is discussed in the Bayonne Industries, Inc., Platty Kill Pond Bioremediation, Revised Final Progress Report 1992 Season, dated June 1993. This report was submitted to the NJDEPE Case Manager on June 6, 1993.





UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

BAYONNE INDUSTRIES, INC.

Site Location Plan / 1-Mile Vicinity Map

Bayonne, Hudson County, NJ

USGS Jersey City, NJ-NY Quadrangle
7.5 Minute Series (Topographic)

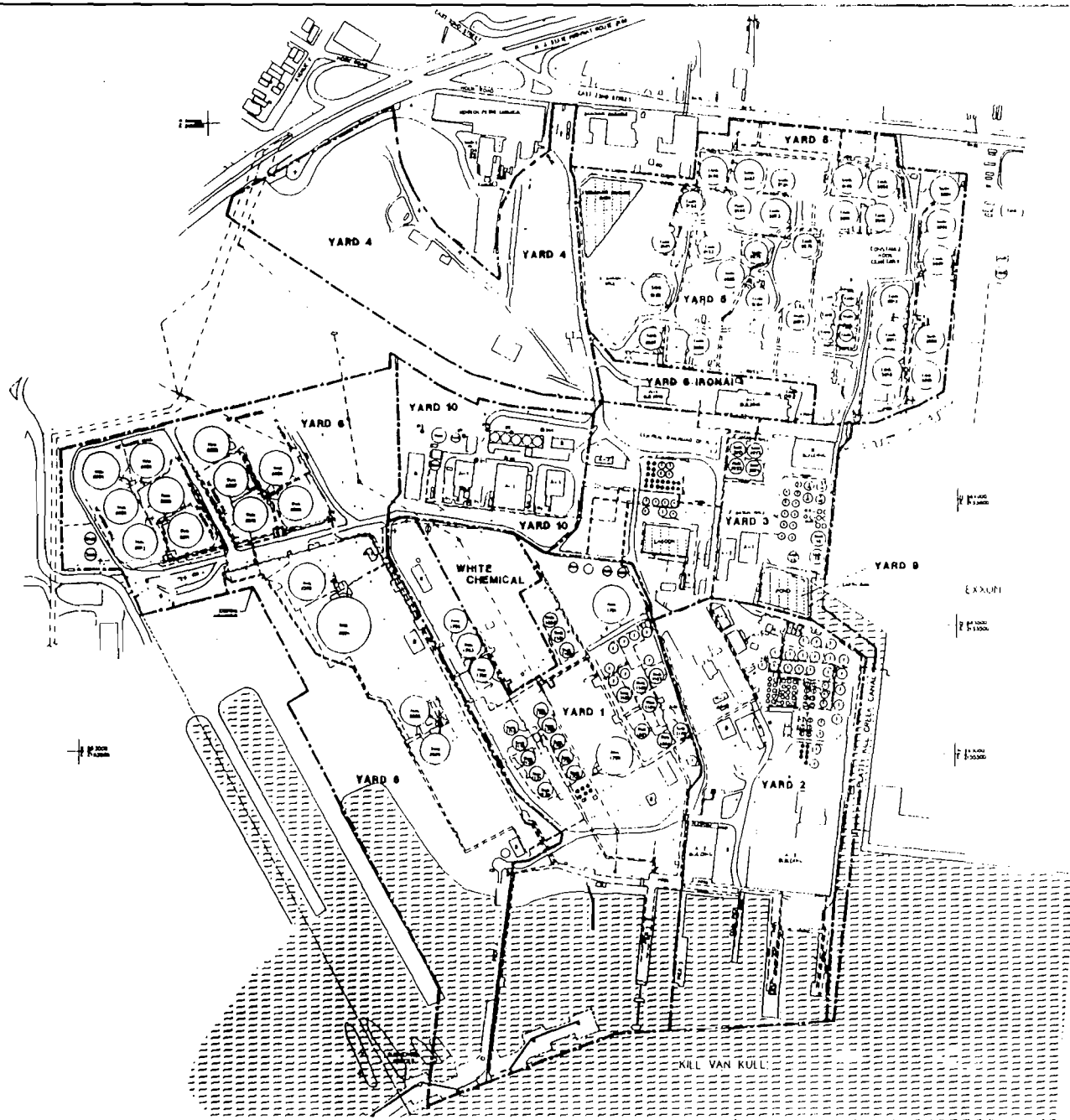
Date: 1967, photorev. 1981

QUADRANGLE LOCATION

Figure: 1
Scale: 1" = 2000'

Prepared by:

ENSR



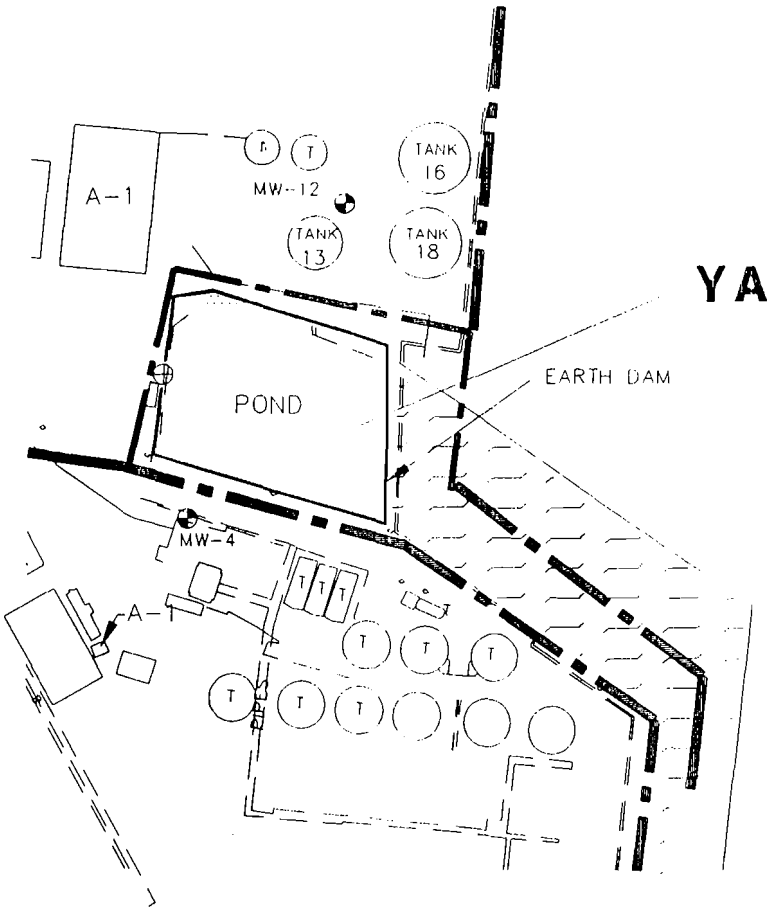
ENSR

ENSR CONSULTING & ENGINEERING

SITE PLAN

BAYONNE INDUSTRIES, INC
BAYONNE, NEW JERSEY

DESIGN:	DG	DATE:	MAY 1993	DRAWING NUMBER
DRAWN:	MJH/TAG	SCALE:	AS NOTED	1-1



YARD 9

0 100 200 300

SCALE: 1" = 100'

ENSR CONSULTING & ENGINEERING

YARD 9 MAP

BAYONNE INDUSTRIES, INC
BAYONNE, NEW JERSEY

DESIGN: DG	DATE: MAY 1993	DRAWING NUMBER: L 6
DRAWN: WJH/TAG	SCALE: AS NOTED	
CHECKED:	APPROVED:	PROJECT NUMBER: REV. NO.

1.2 Equipment Operation

The bioremediation system is composed of four pieces of equipment: two 60-hp Framco aerators (Framco Nos. 1 and 2), one Crisafulli 7.54-hp sludge pump, and a 7.5-hp Oxygun aerator. The two Framco aerators are stationary and located in opposite corners of the approximately rectangular lagoon. The oxygun aerator is mounted on pontoon floats for ease of placement and movement. The Crisafulli sludge pump, which can reach a depth of eight feet, is pontoon mounted, and is connected to the shore via a traversing cable system which bisects the lagoon. A diagram of the bioremediation system equipment configuration is provided as Drawing 3-1.

During each site visit the sludge pump is moved by remote control along the long axis of the impoundment through a control system operated from the shore. Once or twice each month the sludge pump is manually moved laterally across the lagoon. The pump impeller is also remotely raised and lowered from the control box. The purpose of traversing the sludge pump across the impoundment is to suspend the sludge in the water. By placing more sludge in suspension, the surface area required for microbial attachment is increased significantly, consequently, bioremediation of the impoundment sludge is enhanced and accelerated. Based on collected data, movement of the pump appears to have significantly enhanced the efficiency of the system.

1.3 Sludge Volume Estimates

Initial sludge volume estimates were calculated by ENSR to be approximately 6,000 yd^3 in the 1989 Biotreatment Feasibility Study that was conducted on the Platty Kill Pond. This calculation was based on sludge thickness measurements collected at six locations in the impoundment. Sludge thicknesses ranged from two to eight feet.

In September 1992, ENSR conducted a more detailed sludge thickness profile. A grid with cells measuring approximately 20 feet by 20 feet was established and suspended above the top of the lagoon surface. The sludge profile was performed on the grid at 70 grid node locations using a flat bottom boat. A total estimated sludge volume of 4,250 yd^3 was calculated. Drawing 3-1 provides cross-sections and sludge volume calculations for the Platt Kill Pond as of October 1992.

1.4 Summary of Data

Table 2-1 through 2-4 summarizes laboratory analytical results for all samples collected from 1990 through the 1992 operating season. The 1992 TPH results were compared to the 1989 Feasibility Study results. It should be noted that no sludge samples were collected for laboratory analyses during the 1990 and 1991 operating season. The 1989 results indicated a TPH concentration of 230,000 ppm in a composite sample of the sludge collected from the lagoon. This comparison indicates that the TPH concentration of the sludge has been reduced by approximately 34 percent.

TABLE 2-1
Total Petroleum Hydrocarbon (TPH)
Platty Kill Pond Sludge Samples
Bayonne Industries, Inc., Bayonne, New Jersey

Sample ID	Date	TPH Concentration
S-1	June 9, 1992	170,000
S-2	June 9, 1992	150,000
A-6	September 17, 1992	100,000
B-5	September 17, 1992	150,000
C-4	September 17, 1992	150,000
D-3	September 17, 1992	140,000
E-2	September 17, 1992	150,000
F-1	September 17, 1992	120,000

All values expressed in parts per million (ppm).

TABLE 2-2
Toxicity Characteristic Leaching Procedure (TCLP) Analytical Data Summary
Platty Kill Pond Sludge Sample
Bayonne Industries, Inc., Bayonne, New Jersey
September 23, 1992

Compound	CSS-1	Regulatory Limit
Volatile Organics		
Benzene	0.51	0.50
Chlorobenzene	0.45	100.00
Semi-Volatile Organics		
o-Cresol	0.0084J	200.00
TCLP Metals		
Arsenic	0.47J	5.00
Barium	1.0J	100.00
Lead	1.9	5.00
Mercury	0.0017J	0.20

NOTE:
All values expressed in milligrams / liter (mg/l).
CSS indicates composite sludge sample.
J - Estimated value; compound detected below practical quantitation limit.

TABLE 2-3
Sludge Sample Comparison Summary May 1990 / October 1992
Platty Kill Pond
Bayonne Industries, Inc., Bayonne, New Jersey

	1990						1992
Compounds	IM-LS1	IM-LS11	IM-LS2	IM-LS3	IM-LS4	IM-LS5	CSS-2*
Volatile Organic Analysis							
Benzene	99	110	32	64	9.1	87	
Chlorobenzene	2000	1500	72	84	32	240	1
Ethylbenzene	240	230	46	61	42	190	1
Toluene	570	690	250	32	1.8	570	3
Total Xylenes	810	720	67	98	20	570	4
1,1,1-Trichloroethane	---	3.1J	---	---	---	---	--
Tetrachloroethene	---	---	5.8	---	---	---	--
Methylene Chloride	---	---	---	---	---	---	
Semi-Volatile Organics							
1,3-Dichlorobenzene	880	840	23J	---	880	35J	
1,4-Dichlorobenzene	1600	1500	46J	---	1600	61J	
Hexachloroethane	1600	---	---	---	1600	---	
1,2-Dichlorobenzene	6100	4700	22J	---	6100	110	
Naphthalene	1500	1400	550	340	98J	620	
Acenaphthylene	84J	100	---	200	32J	---	
Acenaphthene	240	190	160	240	240	120	
Fluorene	250	230	170	210	250	160	
Phenanthrene	720	690	460	480	120	440	
Anthracene	170	160	79J	58J	13J	67J	
Fluoranthene	160	160	93J	46J	12J	69J	
Pyrene	260	270	150	110	26J	150	
Bis(2-ethylhexyl)phthalate	44J	37J	85J	210	34J	140	
Chrysene	100	110	74J	50J	13J	66J	
Benzo(b)fluoranthene	74J	76J	47J	74J	74J	33J	
Benzo(a)pyrene	69J	60J	38J	69J	7.5J	33J	
Metals							
Barium	1.4	2	1.3	1.37	1.4	1	
Lead	0.72	3.5	---	1.7	0.72	5.2	4
Arsenic	---	---	---	0.25	---	2.39	
Antimony	---	---	---	---	---	---	
Beryllium	NR	NR	NR	NR	NR	NR	
Cadmium	---	---	---	---	---	---	
Chromium	---	---	---	---	---	---	
Copper	NR	NR	NR	NR	NR	NR	2
Nickel	NR	NR	NR	NR	NR	NR	
Zinc	NR	NR	NR	NR	NR	NR	
Cyanide	1.9	1.5	1.8	1.3	---	1.7	
Phenols	267	232	40	42	---	51	0

--- Not detected.
J Estimated value, compound detected below the quantification limit. Concentration is approximate.
* CSS indicates composite sample.
** Compound not detected above practical quantitation limit.
All results expressed in parts per million (ppm).
NR -- Not reported.

TABLE 2-4
Analytical Data Summary May 1990
Platty Kill Pond Aqueous Sample
Bayonne Industries, Inc., Bayonne, New Jersey

Compounds	IM-LW1
Volatile Organic Analysis	
Carbon Tetrachloride	0.0015J
Chloroform	0.0087
1,2-Dichloroethane	0.0042
1,1,1-Trichloroethane	0.0012
1,1,2-Trichloroethane	0.001
Trichloroethene	0.0066
Vinyl Chloride	0.0061J
Total Xylenes	0.0031
Base/Neutrals	
Isophorone	0.043
Dibutyl phthalate	0.014
Metals	
Lead	0.011
Arsenic	0.0097
Zinc	0.034
Phenols (total)	0.052

All results expressed in parts per million (ppm).
J - Estimated value, compound detected below the quantification limit.

1.5 Air Monitoring Study

Air monitoring was conducted using open-path Fourier-Transform infrared (FTIR) Spectroscopy. Measurement data were collected for 15 separate 10-minute events over an approximate 3.5 hour period. Ethylbenzene was detected in five of the 15 events, four of these detected concentrations were considered J values (estimated concentrations defined as less than twice the method detection limit [MDL]). O-xylene was also detected as a J value in one out of the 15 monitoring events. No other target compounds were detected. Emission rates were determined for ethylbenzene and o-xylene based on the actual concentrations detected. Emission rates for the remaining eight target compounds were estimated based on their respective MDLs.

Bayonne Industries, Inc.

Bayonne, New Jersey

ENSR

Platty Kill Pond Bioremediation Project 1995 Operating Season Report

ENSR Consulting and Engineering

April 1996

Document Number 3782-007(2)\95OPSEA\IMT.RPT

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1.0 INTRODUCTION

This report summarizes activities associated with bioremediation of the Platty Kill Pond during the 1995 operating season. Due to major malfunctions in the three main pieces of operating equipment, the operating season spanned only 67 days, from May 15 to July 20, 1995. Activities conducted in this operating season included:

- Operation of the bioremediation system from May 15 to July 20, 1995.
- Daily and weekly monitoring of parameters to assess remediation system performance.
- Repair and maintenance of the operating system equipment.
- Collection and analysis of aqueous and sludge samples at the beginning and at the end of the operating season.
- Collection of sludge profile data in August, 1995 at the end of the operating season.

Section 2 of this report provides historical background information on the Platty Kill Pond and a brief summary of the bioremediation project. Section 3 provides a summary of activities conducted in 1995 operating season. Section 4 provides a summary of the analytical data collected, and Section 5 provides conclusions and recommendations for continuation of this project.

2.0 BACKGROUND SUMMARY

The Bayonne Industries, Inc. site is a bulk liquid petroleum storage facility located in the Constable Hook area of Bayonne, Hudson County, New Jersey. From the 1870s to approximately 1956, the site operated as a major petroleum refinery. Refinery operations ceased in approximately 1956. Since then the site operated as a bulk storage terminal. Until the mid-1950s, the Platty Kill Pond, an on-site surface impoundment, received all stormwater runoff and process water from the refinery and other tenants at the facility. When the refinery operations ceased in the mid-1950s, the only discharge from the facility to the pond was stormwater runoff. In 1978, a wastewater treatment unit was installed by Bayonne Industries to treat stormwater runoff prior to discharge to the pond. In 1986, all discharges to the pond were discontinued and re-routed to the Platty Kill Canal.

In 1989 ENSR conducted a treatability study of the sludge in the Platty Kill Pond to determine the feasibility of bioremediation as an alternative remediation technology for the pond. ENSR conducted a primary screen and a scaled-up confirmation study on the pond sludge. Results from these studies indicated that bioremediation of the pond sludge was a feasible alternative, and that a 43 percent reduction in organic content, as measured by total petroleum hydrocarbons (TPH) could be expected. Analytical results from samples of the sludge at the completion of the study indicated that the volatile and semivolatile compounds detected in the sludge prior to initiation of the test were not detected at the end of the test period, and that metal concentrations generally increased. Results of this study were provided to Bayonne Industries in a document titled Bioremediation Feasibility Study for the Platty Kill Pond and Wemco Lagoon, April 1989.

ENSR began bioremediation of the sludge in the pond in the fall of 1990. The system operated for approximately two months in 1990 (October-November) using two Framco aerators and an Oxygun as sources of oxygen to the pond water. In 1991 the system was operated from mid-April to the beginning of November. The short operating season in 1990 identified the need to increase the amount of sludge suspended in the water column; therefore, a sludge pump was added in August 1991 to lift and shear the sludge. In 1992, the system was operated from early June to early November. To further enhance the sludge suspension in the water column, the sludge pump was routinely moved to different locations on the pond. At the end of the 1992 operating season, the two Framco aerators were removed and overhauled by the manufacturer.

In May 1993, the overhauled aerators were mounted on newly acquired floating platforms and reinstalled with a newly configured cable system. The sludge pump was anchored on a separate cable system which allowed manual traversing of the sludge pump in the pond in a step-wise fashion. A high visibility fence was erected around the pond to clearly mark the work zone, and limited access of floating debris to the pond. The equipment, however, was not operated during the 1993 season and the first four months of the planned 1994 operating season due to the NJDEP's request for an air permit for the bioremediation project, and the associated delays in acquiring the same. The system operated for a total of 78 days in 1994. The abbreviated operating season, coupled with less than optimal equipment performance and weather conditions, did not further the bioremediation process significantly. At the end of the operating season it was determined that the bioremediation system needed to be operated aggressively for at least one more full season for significant additional reduction in hydrocarbon content.

2.1 Sludge Volume Reduction through 1994

Initial sludge volume estimates were calculated to be approximately 6,000 yd^3 in the 1989 Biotreatment Feasibility Study that was conducted on the Platty Kill Pond. This calculation was based on sludge thickness measurements collected at six locations in the impoundment. Sludge thicknesses ranged from two to eight feet with an average thickness of approximately five feet. The average thickness was multiplied by the impoundment dimensions to arrive at the original 6,000 yd^3 volume calculation.

In 1991, depth to top of sludge measurements were collected from 15 locations on the impoundment. These measurements indicated the presence of two holes in the sludge layer in the vicinity of the two Framco aerators. These holes extended to the bottom of the impoundment, with depths measured up to 12 feet below the water surface. Depth to the top of the sludge layer in undisturbed portions of the impoundment measured approximately four feet below water surface. Based on this data the original average sludge thickness was recalculated to be approximately eight feet and the original sludge volume was recalculated to be 10,000 yd^3. This recalculation of the original sludge volume is further supported based on a 1979 report prepared by Roy F. Weston, entitled Evaluation of Control Alternatives for the Separator Pond. Field work documented in this report includes the installation of five borings in the pond that estimate the "oily sludge layer" to be 11 to 15 feet thick. The 1991 sludge volume was calculated to be approximately 8,300 yd^3.

In September 1992, ENSR conducted a more detailed sludge thickness profile. Using a grid system suspended over the pond, sludge thickness data were collected at 70 locations, and a sludge volume of approximately 4,600 yd^3 was calculated at the end of the 1992 operating

season. The reduction in sludge volume has been estimated to be approximately 57 percent from the beginning of the project in 1990 through the 1992 operating season.

Two sets of sludge volume estimate data were collected during the 1993/1994 operating seasons. The first set of data was collected on May 4, 1993 and the second set of data on December 22, 1994. For each measurement, sludge profile data were collected at 70 points on the pond utilizing the 1992 measurement technique. The sludge volume was estimated to be 5,400 yd^3 in April 1993, and 5,500 yd^3 in December 1994. There was essentially no change in sludge volume during the shortened 1994 operating season. Differences in sludge volume estimates between these results and those obtained at the end of the 1992 season, which indicated an estimated sludge volume of approximately 4,600 yd^3, are attributed to variability in the measurement technique used. The estimated sludge volume reduction since initiation of the bioremediation system in the fall of 1990 was approximately 55 percent.

2.2 Contaminant Reduction Through 1994

Analytical results from a composite sludge sample collected in 1989, at the initiation of the bioremediation feasibility study, indicated TPH concentrations of 23 percent or 230,000 parts per million (ppm), along with the presence of elevated concentrations of volatile, semi-volatile, and inorganic compounds. This data was initially used for baseline contaminant concentrations; however, the NJDEP rejected this data in 1990, and required re-sampling of the pond sludge. It is assumed that the reason the 1989 data was rejected is because the results reflected contaminant concentrations in a composite sample, rather than from discrete sample locations in the pond. In April 1990, five sludge samples plus a duplicate were collected from discrete locations in the pond and submitted for laboratory analysis of priority pollutant volatile, semi-volatile and pesticide/PCB analysis; TCLP metals; cyanide; phenols; and total organic carbon (TOC). This re-sampling did not include TPH as one of the analytical parameters. Therefore the 230,000 ppm TPH concentrations specified at the initiation of the treatability study will be used as a baseline for evaluation purposes.

Two samples for TPH analysis were collected from the pond in June 1992, and six samples in September 1992. TPH concentrations averaged 160,000 ppm for the June samples and 135,000 ppm for the September samples.

During the 1993/94 operating season, sludge samples were collected on three different occasions - June 1993, May 1994, and December 1994. For each sampling event, five samples were collected, one each from four discrete locations in the pond, and one duplicate. As expected, since the system had not been operated in 1993, sludge sample TPH concentrations in April 1994 were similar to TPH concentrations at the end of the 1992 operating season, and

those collected in June 1993. TPH concentrations in sludge samples collected in December 1994 indicated a significant reduction. Average TPH concentrations for the April 1994 samples were 144,600 ppm (ranging from 113,00 ppm to 198,000 ppm), average TPH concentrations for the December 1994 samples were 52,200 ppm (ranging from 17,000 ppm to 76,000 ppm). Table 2-1 presents a summary of the TPH results from the 1989 treatability study through the end of the 1994 season.

To further evaluate the bioremediation process, the average individual contaminant concentrations of six sludge samples collected in April 1990, prior to the startup of the bioremediation system, were compared to average contaminant concentrations of sludge samples collected in December 1994, at the end of the 1994 operating season. This comparison is presented in Table 2-2, along with the percent reduction of each contaminant concentration. This comparison clearly illustrates that the bioremediation process has resulted in significant reductions in targeted contaminant concentrations.

Table 2-1
Average Yearly TPH Concentrations (1989-1994)
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Date	Average TPH Concentration
1989	230000
June 1992	160000
September 1992	135000
June 1993	172000
April 1994	144600
December 1994	52200
All concentrations are expressed in parts per million (ppm)	

Figure 2-1
Average Yearly TPH Concentrations (1989-1994)
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

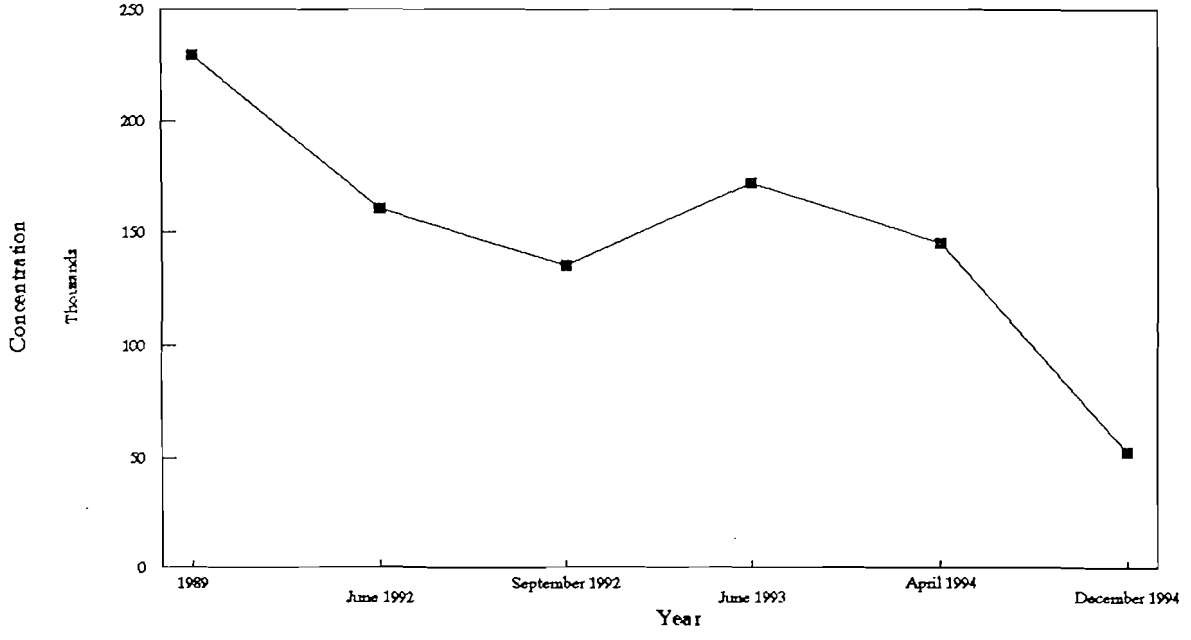


Table 2-2
May 1990/December 1994 Sludge Sample Comparison
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organic Compounds	May 1990*	December 1994**	% Reduction
Benzene	66.85	70.5	-5.46
Chlorobenzene	654.67	1496.8	-128.63
Ethylbenzene	134.83	118.6	12.04
Toluene	352.3	95.0	73.05
Total Xylenes	380.83	333.8	12.35
1,1,1-Trichloroethane	0.52	ND	100.00
Tetrachloroeyhene	0.97	ND	100.00
Semi-Volatile Organic Compounds			
1,2-Dichlorobenzene	2839	17.0	99.40
1,3-Dichlorobenzene	443	33.0	92.55
1,4-Dichlorobenzene	801	57.6	92.81
2-Methylnaphthalene	NR	226.0	---
Acenaphthene	198	44.0	77.78
Acenaphthylene	69	11.2	83.74
Anthracene	91	26.4	71.03
Benzo(a)Anthracene	ND	20.7	-100.00
Benzo(a)Pyrene	46	13.6	70.35
Benzo(b)Fluoranthene	63	8.0	87.27
Benzo(g,h,i)Perylene	ND	7.1	-100.00
Benzo(k)Fluoranthene	ND	6.6	-100.00
Bis(2-Ethylhexyl)Phthalate	92	55.6	39.57
Butylbenzylphthalate	ND	ND	0.00
Chrysene	69	22.4	67.59
Di-n-Octylphthalate	ND	29.6	-100.00
Dibenzofuran	NR	11.7	---
Fluoranthene	90	29.4	67.33
Fluorene	212	39.2	81.51
Hexachloroethane	533	ND	100.00
Indeno(1,2,3-cd)Pyrene	ND	6.3	-100.00
Isophorone	ND	15.2	-100.00
N-Nitrosodiphenylamine	ND	ND	0.00
Naphthalene	751	184.8	75.39
Phenanthrene	485	124.2	74.39
Pyrene	161	70.2	56.40
Inorganics			
Aluminum	NR	8318.0	---
Antimony	NR	10.0	---
Arsenic	NR	418.0	---
Barium	NR	581.8	---
Beryllium	NR	0.8	---
Cadmium	NR	4.0	---
Calcium	NR	12026.0	---
Chromium	NR	270.4	---
Cobalt	NR	27.9	---
Copper	NR	2262.0	---
Iron	NR	106000.0	---
Lead	NR	6918.0	---
Magnesium	NR	7398.0	---
Manganese	NR	439.8	---
Mercury	NR	1.7	---
Nickel	NR	127.0	---
Potassium	NR	1384.0	---
Selenium	NR	2.4	---
Silver	NR	1.6	---
Sodium	NR	5844.0	---
Thallium	NR	0.4	---
Vanadium	NR	176.4	---
Zinc	NR	745.2	---

** Average Concentration of Five Sludge Samples, Including Duplicate
* Average Concentration of Six Sludge Samples, Including Duplicate
All results are Reported in Parts Per Million
NR - Compound not reported
ND - Compound not detected
Metals reported as total concentration, not leachable concentration

3.0 SUMMARY OF OPERATIONS

This section summarizes operations at the pond for the abbreviated 1995 operating season which spanned 67 days, from May 15, to July 20, 1995.

3.1 Bioremediation System Operations

The bioremediation operating system at the Platty Kill Pond consists of five pieces of equipment:

- two Framco aerators - to deliver oxygen to the pond water
- one Framco oxygun - to provide a localized source of oxygen to the pond water
- one Crisafulli sludge pump - to facilitate the dispersion and shearing of sludge and mixing of nutrients
- one nutrient delivery system - to facilitate delivery of nutrients in solution form. (Urea and phosphate)

The oxygun was not operated during the 1994/1995 operating seasons, and will be removed at the start of the 1996 season.

ENSR representatives monitored the bioremediation operations eight hours a day, five days a week. The monitoring included daily field testing of the pond water; weekly sampling of the pond water for laboratory analysis; and operation and maintenance of equipment, including movement of the sludge pump to suspend sludge material in the water column. In addition, sludge profile data was collected in August 1995 to determine sludge volume reduction.

3.1.1 Equipment Operation and Maintenance

This section summarizes the operation and maintenance of the bioremediation system components, including the aeration units, sludge pump, and the nutrient delivery system. Due to equipment failure the system only operated from mid-May through mid-July. In reading this section, it should be kept in mind that this operating environment is intentionally highly oxygenated and very abrasive, neither of which is conducive to ease of equipment operation. After several seasons in place, some of which were spent idle, it is not surprising that equipment maintenance is a problem.

3.1.1.1 Framco Aeration Units

At the end of 1994 operating season, the two Framco aeration units were located at the northeast and southwest perimeters of the pond and positioned approximately diagonally opposite to each other. These locations promoted the maximum circulation of the pond water. The pontoon mounted aerators were connected to the perimeter cable via 5/16-inch steel cable.

On May 15, at the beginning of the 1995 operating season, both aerators functioned satisfactorily. However, within two days of start-up, the north aerator stopped working. The aerator was removed from the pond to troubleshoot the problem. The starter box internals of this aerator were found to be weathered, probably due to corrosion, and the motor was shorted, requiring the unit to be rebuilt. The aerator and motor were shipped in July 1995 to an outside contractor for shop testing and to carry out necessary repairs.

From May 17 on, the south aerator was the only aerator operating in the pond. On July 19, the south aerator stopped working. The aerator was removed from the pond to troubleshoot the problem. As with the north side aerator, the internals of this aerator were found to be weathered and the transformer needed to be replaced, requiring the unit to be rebuilt. The south aerator was shipped out for repairs on July 31.

The refurbished north aerator was delivered to the site on August 18, 1995. The refurbished south aerator was delivered to the site in mid-September, 1995. Since both aerators were inoperable and the sludge pump also had mechanical problems at the same time (as described below), a decision was made not to restart the system in 1995 because by the time all of the equipment was operational it would be well into autumn and would be under less than optimal operating conditions. All rebuilt operating equipment will be installed at the beginning of the 1996 operating season.

3.1.1.2 Sludge Pump

The function of the sludge pump is to facilitate the dispersion of sludge in the water column and the mixing of nutrients in the pond water. In order to achieve adequate dispersion of sludge across the pond, the sludge pump was traversed aggressively in both east-west and north-south directions.

Toward the end of the prior operating season in October 1994, the sludge pump malfunctioned. Upon inspection, the screen around the impeller was found to be missing, and the impeller came off the shaft very easily. The sludge pump was removed from the pond to make the necessary

repairs. By the time ENSR received the parts the 1994 seasonal activities had ended, and the pump repair was postponed until the beginning of the 1995 operating season.

At the beginning of the 1995 operating season in May, the sludge pump replacement parts were installed with the assistance of IMTT personnel. Also, the discharge pipe on the pump was repaired. After making these repairs, the sludge pump functioned satisfactorily and the pump was moved aggressively on a daily basis.

Most of the maintenance problems associated with the sludge pump rig in the 1995 operating season were due to less than satisfactory performance of the hoist and traverse mechanisms. On June 15, 1995, a D-ring connecting the pump to the hoist cable snapped, and the pump fell to a vertical position in the lagoon. The damaged parts were replaced and the pump was started satisfactorily. On June 29, the east-west traverse cables encountered problems. Shear pins broke on the southwest and northeast grip-hoists due to "frozen" hoist mechanisms which resisted movement. These pins were replaced and temporary measures were taken to avoid the jamming of the mechanisms. On July 17, ENSR noted that the hoist cable was disconnected from the pump. The pump was still functioning with the discharge in a downward direction. The pump stopped functioning a day later. Efforts to reactivate the pump were unsuccessful. The pump rig was removed from the pond and evaluated for damage. The pump agitator, impeller, and shaft bolt were missing. The damaged and missing parts were replaced and the cable system was reconfigured. After one day of operation after the repairs, the pump malfunctioned again. Inspection of the pump revealed that all the newly installed pump parts were once again missing. Upon closer inspection it was determined that the impellar shaft was bent, and was vibrating the impeller bolt loose. This pump will be replaced at the beginning of the 1996 season.

3.1.1.3 Nutrient Delivery System

The nutrient solution was made in a 55-gallon open top steel drum with piping arranged so that water was pumped from the pond into the bottom of the drum, and overflowed back into the pond from the top. Water was drawn from the pond with a sump pump and circulated through the drum, thereby dissolving the nutrients. A 3-foot settling section in the drum (bottom to top) minimized the amount of solid nutrient carried into the pond. A nutrient increment (one half bag) was dumped into the drum and the water flow was continued until complete dissolution of the nutrient was achieved. The sump pump was turned off when there was no more solid nutrient material left in the drum. The dissolved nutrient solution was directed to the vicinity of the south Framco aeration unit, where it was picked up by the pond water circulation pattern and distributed throughout the water column.

In the 1995 operating season, the sump pump circuitry failed once in May and had to be replaced. Apart from this problem, the nutrient delivery system worked satisfactorily throughout the season.

3.1.2 Daily Monitoring Operations

Daily monitoring operations started on May 15, 1995 and ended on July 20, 1995. During each site visit, the ENSR representative conducted field testing of the impoundment water for pH, nitrogen measured as ammonia (NH_3), phosphate (PO_4), dissolved oxygen (DO), oxygen uptake rate (OUR), and temperature. These parameters were measured using portable pH, temperature, and dissolved oxygen meters, and colorimetric field test kits for NH_3 and PO_4. A summary and discussion of the results of these measurements is provided in Section 4.0 of this report. ENSR collected 71 sets of field test data during the 1995 operating season. Field test data were collected twice a day. The first set was collected upon arrival at the site, and the second set was collected after traversing the sludge pump through the pond, typically towards the end of the day. Results of the field tests were used to monitor biological activity and to determine when nutrients needed to be added to the pond to enhance the bioremediation process.

The phosphate concentration was adjusted by adding 0-40-0 super triple phosphate to the pond. The goal was to maintain a PO_4 concentration of 2 ppm. Approximately 1600 lbs of 0-40-0 were added to the lagoon during the 1995 season.

The nitrogen concentration was adjusted by adding urea to the pond, in an effort to maintain an NH_3 concentration of 50 ppm. During the 1995 operating season the 50 ppm concentration of nitrogen could not be attained. The nitrogen content generally ranged from 10 to 20 ppm, even with the addition of significant amounts of urea. A total of approximately 1,750 lbs of urea were added to the pond in 1995.

3.1.3 Weekly Monitoring Operations

In addition to the collection of daily field monitoring data, ENSR collected 14 sets of weekly water samples from the pond for laboratory analysis. An analytical parameter set consisted of biological oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), total suspended solids (TSS), volatile suspended solids (VSS), nitrate, ammonia, ortho-phosphate, and chloride. Results of these analyses were used to monitor the biological activity in the impoundment.

ENSR collected two aqueous samples from the pond for each weekly laboratory analysis. A summary and discussion of the weekly laboratory results is provided in Section 4.0 of this progress report.

3.1.4 Collection of Sludge and Aqueous Samples

To monitor and evaluate the change in TPH and individual compound concentrations, aqueous and sludge samples were collected in May at the beginning of the operating season and August at the end of the abbreviated season.

The aqueous samples were collected from approximately the center of the pond. A flat bottom boat was used to get to the center of the pond. The sample bottles were filled by submerging them approximately two inches below the water surface.

The sludge sample locations were determined by dividing the pond into four approximately equal quadrants. From the approximate mid-point of each quadrant, one sludge sample was collected. The location of each sample was identified using the same grid system used for the collection of the sludge profile measurements. The sludge samples were collected from a flat bottom boat by lowering a length of 2-inch PVC pipe through the water into the sludge at the bottom of the pond. As the pipe penetrated the sludge, a vacuum was created by raising an internal plunger equipped with a gasket at its lower tip. The PVC pipe with the sludge core inside was then removed from the water. Each core was extruded into a decontaminated stainless steel bowl, prepared in accordance with the May 1992 NJDEPE Field Sampling Procedures Manual. Using a decontaminated stainless steel trowel, the sample bottles were filled by transferring sludge material from the bowl to the sample bottle. The sample bottles for volatile organic compound analyses were filled first, prior to any homogenization of the sludge. The remaining sludge in the bowl was homogenized prior to filling the remaining sample bottles.

3.1.5 Determination of Sludge Profile

Sludge profile data was collected in August 1995, at the end of the operating season. This data was collected using the same method employed in the 1992 operating season. This included the use of a grid system that was suspended over the pond, and the collection of sludge thickness data at 70 locations. At each of the locations, the top of the sludge was determined using a 10-foot long, 1-inch PVC pipe which was ruled and notched at six inch intervals, with a round 1-foot diameter plate at the end. The pipe was lowered into the water-sludge mix until the plate contacted the sludge surface, at which point the depth was recorded. The approximate sludge thickness was determined by inserting a 15 foot long, 1/2-inch diameter steel rod through the PVC pipe and manually pushing through the sludge until refusal, at which point a thickness

measurement was collected. All top-of-sludge measurements were referenced to a fixed point on the bulkhead to account for fluctuations in the top of the water surface. Based on the field measurements, sludge volume estimates were calculated using AutoCAD version 12.0 (1992 AutoDesk, Inc.). Sludge volume estimates are summarized in Section 4.1.

4.0 DATA SUMMARY

This section summarizes the sludge volume estimate data; daily field monitoring data; weekly monitoring data; and aqueous and sludge sample analytical data for the 1995 operating season.

4.1 Sludge Volume Estimates

The sludge volume in the pond was estimated on September 9, 1995 at the end of operating season. The sludge profile measurements were taken at 70 points in the pond in accordance with the method outlined in Section 3.1.5. Sludge volume was then estimated using AutoCad version 12.0 (1992 AutoDesk, Inc.).

The sludge volume in September, 1995 was estimated to be 3,733 yd^3. The sludge profile data and volume calculations are presented in Figure 4-1. The sludge profile data collected in December 1994 was used as a baseline for the 1995 operating season. Figure 4-2 presents the December 1994 sludge profile data and volume calculations. The estimated reduction in sludge from the end of the 1994 season to the end of the abbreviated 1995 season was 1,767 yd^3, or approximately 32 percent. The estimated reduction in sludge volume since the bioremediation startup in the fall of 1990 is approximately 63 percent. The sludge volume reduction since 1990 is graphically represented in Figure 4-3. This reduction in sludge volume is encouraging in light of the fact that the system operated under far less than optimal equipment performance in 1995 operating season. Table 4-1 provides a summary of the estimated sludge volumes from 1990 through 1995. The actual sludge volume reduction is likely represented by the average slope of the line in Figure 4-3, given the uncertainty of the measurement method.

4.2 Daily Field Monitoring Results

A total of 71 sets of daily field monitoring data were collected during the 1995 operating season. Typically two sets of aqueous samples were collected and field tested each day to evaluate the effect the aggressive movement of the sludge pump had on the bioremediation system over the course of each day. Each set of samples was analyzed for pH, nitrogen, measured as ammonia (NH_3), phosphate (PO_4), dissolved oxygen (DO), oxygen uptake rate (OUR), and temperature. Results of the daily testing are presented in Table 4-2.

Table 4–1
1990 – 1995 Estimated Sludge Volume Reduction
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

DATES	CUBIC YARDS
1990	10000
1991	8300
September 1992	4600
May 1993	5400
December 1994	5500
September 1995	3700

Figure 4–3
1990 – 1995 Estimated Sludge Volume Reduction
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

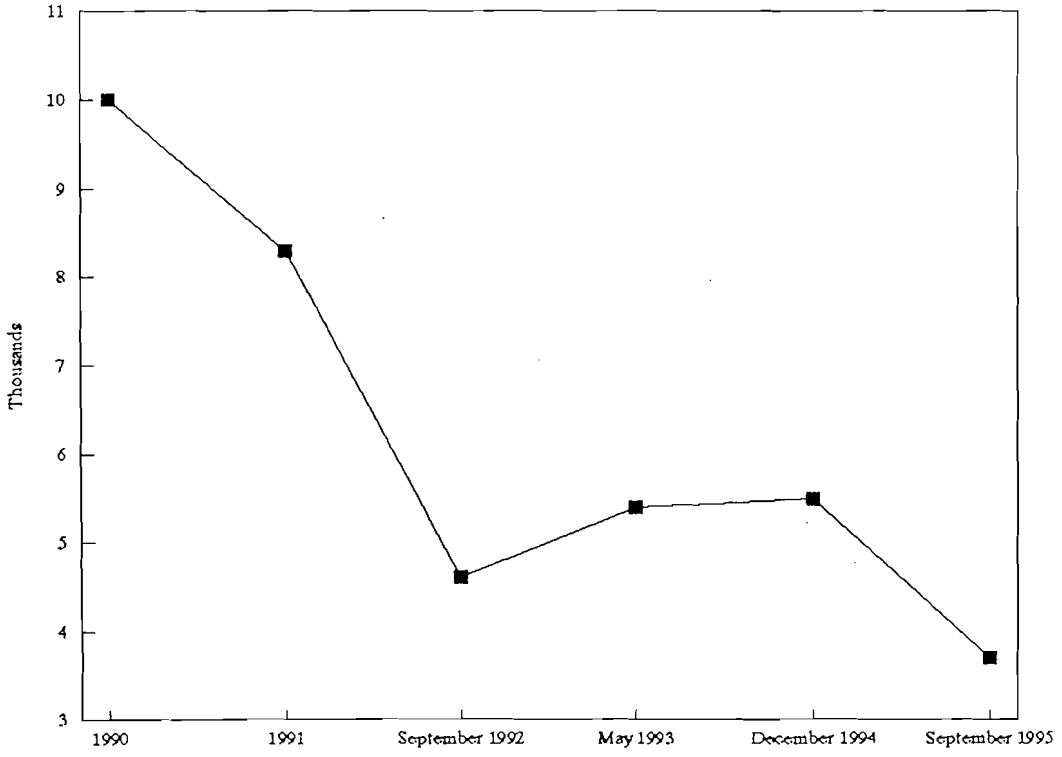


TABLE 4-2
1995 Daily Monitoring Field Measurements
Platty Kill Pond Bioremediation Porject
Bayonne Industries, Inc.
Bayonne, New Jersey

Event	Time	Date of Sampling	pH	Water Temperature (Deg C)	Dissolved Oxygen (mg/L)	Ammonia (mg/L)	Phosphate (mg/L)	Oxygen Uptake Rate (mg/L/hr)
1	1130	5/18/95	7.2	21.7	5.69	2.0	0.90	0.210
2	1520	5/19/95	7.2	18.5	5.94	2.0	0.32	0.160
3	0920	5/22/95	7.2	22.2	5.80	3.0	0.28	0.075
4	1510	5/22/95	7.2	---	5.25	4.0	0.68	0.143
5	0940	5/23/95	7.2	27.2	5.90	3.0	0.98	0.113
6	1455	5/23/95	7.2	24.5	5.96	3.0	0.28	0.720
7	1055	5/24/95	7.2	24.0	4.20	4.0	0.99	0.203
8	1515	5/24/95	7.2	'26.8	3.82	3.0	0.20	0.293
9	1050	5/25/95	7.2	24.4	4.52	5.8	0.30	0.323
10	1515	5/25/95	7.2	24.1	3.21	6.0	0.28	0.530
11	0930	5/30/95	7.2	21.7	4.82	5.0	0.10	0.202
12	1515	5/30/95	7.2	22.4	4.26	10.0	0.40	4.300
13	1050	5/31/95	7.2	23.7	4.74	8.0	0.04	3.600
14	1500	6/1/95	7.2	26.0	3.19	12.0	4.20	4.280
15	1155	6/2/95	7.2	24.5	5.26	4.5	3.40	1.880
16	1445	6/2/95	7.2	25.3	3.84	11.0	1.50	3.830
17	0740	6/5/95	7.2	23.9	4.97	12.0	0.05	3.750
28	0915	6/6/95	7.2	25.6	3.11	13.0	1.30	3.350
19	1512	6/6/95	7.2	27.7	2.41	16.0	3.30	3.600
20	0830	6/7/95	7.2	23.3	5.01	15.0	1.50	2.870
21	1430	6/7/95	7.2	24.9	2.62	18.0	0.05	3.770
22	1015	6/8/95	7.2	26.1	3.13	16.0	2.80	4.130
23	1505	6/8/95	7.2	25.1	2.49	17.0	2.10	7.430
24	1020	6/9/95	7.2	24.4	3.29	16.0	1.40	2.250
25	1457	6/9/95	7.2	25.3	3.22	19.0	1.10	9.980
26	1502	6/12/95	7.2	23.9	5.89	14.0	2.60	8.630
27	0810	6/13/95	7.2	20.9	6.36	12.0	0.50	2.100
28	1505	6/13/95	7.2	22.1	3.40	21.0	1.00	3.300
29	0940	6/14/95	7.2	21.4	6.07	19.0	0.08	1.730
30	1508	6/14/95	7.2	23.1	3.06	17.0	1.90	3.600
31	1015	6/15/95	7.2	23.2	3.62	1.7	0.10	3.530
32	1410	6/15/95	7.2	23.3	3.89	20.0	3.90	2.480
33	1120	6/20/95	7.2	27.2	---	1.9	1.30	1.570
34	1525	6/20/95	7.2	27.0	1.34	20.0	4.00	3.900
35	1045	6/21/95	7.2	24.9	5.04	20.0	3.20	5.700
36	1640	6/21/95	7.2	24.3	---	23.0	3.30	---
37	0815	6/22/95	7.3	22.2	6.22	20.0	0.10	3.150
38	1500	6/22/95	7.2	23.3	4.25	21.0	3.60	4.870
39	0640	6/23/95	7.4	21.9	6.66	18.0	3.50	1.800
40	1430	6/23/95	7.3	23.4	4.03	21.0	3.40	3.600
41	0943	6/26/95	7.8	25.4	6.12	18.0	1.70	2.320
42	1520	6/26/95	7.8	25.5	6.28	19.0	1.50	1.800
43	0700	6/27/95	7.8	23.1	7.37	18.0	1.20	4.650

TABLE 4-2
1995 Daily Monitoring Field Measurements
Platty Kill Pond Bioremediation Porject
Bayonne Industries, Inc.
Bayonne, New Jersey

Event	Time	Date of Sampling	pH	Water Temperature (Deg C)	Dissolved Oxygen (mg/L)	Ammonia (mg/L)	Phosphate (mg/L)	Oxygen Uptake Rate (mg/L/hr)
44	1439	6/27/95	7.7	24.8	5.19	16.0	1.40	3.520
45	0815	6/28/95	7.2	21.7	3.59	18.0	0.50	2.330
46	1600	6/28/95	7.2	23.1	3.05	20.0	5.00	4.280
47	0830	6/29/95	7.2	22.4	4.96	20.0	4.30	3.300
48	1530	6/29/95	7.2	24.4	4.52	15.0	0.50	4.820
49	0930	6/30/95	7.2	23.6	4.01	18.0	0.00	4.230
50	1445	6/30/95	7.3	26.4	3.29	18.0	4.50	3.830
51	0625	7/5/95	7.3	24.9	6.37	15.0	1.40	2.770
52	1410	7/5/95	7.3	27.4	4.29	14.0	1.30	2.620
53	0745	7/6/95	7.2	25.5	4.83	12.0	4.00	2.780
54	1635	7/6/95	7.2	26.8	1.48	12.0	0.50	4.930
55	0810	7/7/95	7.2	25.3	1.20	11.0	3.30	4.650
56	1435	7/7/95	7.2	24.5	1.10	17.0	2.00	3.750
57	0830	7/10/95	7.2	23.0	3.85	18.0	5.00	3.680
58	1540	7/10/95	7.3	25	1.87	20.0	2.80	3.080
59	0905	7/11/95	7.2	24.7	4.09	16.0	1.50	3.000
60	1430	7/11/95	7.2	25.9	1.63	18.0	1.40	3.450
61	1110	7/12/95	7.2	25.2	4.44	21.0	2.20	2.250
62	1432	7/12/95	7.2	26.8	3.50	16.0	1.70	2.630
63	0730	7/13/95	7.2	25.0	3.77	21.0	trace	3.450
64	1000	7/14/95	7.2	27.5	1.59	16.0	1.20	3.550
65	1430	7/14/95	7.2	28.2	1.61	1.7	2.60	4.850
66	0735	7/17/95	7.1	25.2	0.62	16.0	4.50	3.300
67	1410	7/17/95	7.2	27.0	1.32	14.0	4.50	3.000
68	0720	7/18/95	7.2	25.2	5.50	12.0	4.50	2.250
69	1445	7/18/95	7.2	27.9	3.05	18.0	4.50	2.550
70	1305	7/19/95	7.2	26.5	4.46	11.0	1.20	4.730
71	0900	8/3/95	7.2	26.9	---	9.0	1.00	---

--- measurement not recorded

4.2.1 pH Measurements

The solution pH has long been known to affect the growth rate of microbial cultures. Most cultures display a region in which growth rate is insensitive to pH. The band of insensitivity is relatively small, generally covering a range of 2 or 3 pH units. Typically, a sharp decrease in the bacterial growth rate is noted on either side of this region. For most aerobic bacteria the region of pH insensitivity is centered around 7. It is, therefore, important to observe pH values carefully.

During the 1995 operating season, the pH of the water remained relatively constant, without the need for chemical adjustment. Figure 4-4 graphically presents the daily pH measurements. pH values ranged typically between 7.1 and 7.3. There were no notable changes in pH over the course of the operating day, as measured by the two sets of samples collected daily.

4.2.2 Nutrient Measurements

Three essential nutrients must be provided when an aerobic microbial culture degrades organic matter: oxygen, nitrogen and phosphorus. The stoichiometry of the microbial system determines the total quantity of each which will be needed for cell growth. Each nutrient's target concentrations and actual measurements are discussed below.

4.2.2.1 DO and OUR Measurements

Due to the maintenance problems described in Section 3, the system operated for only 67 days and only one aerator was in operation during this abbreviated season. This limitation did have an adverse impact on the Dissolved Oxygen (DO) concentration levels in the pond. During the operating season, DO levels were much lower than the theoretical saturation concentration seen in previous seasons when both aerators were operating. The Oxygen Uptake Rate (OUR), a measure of the rate at which oxygen is consumed during microbial degradation of the dissolved organic matter in water, showed results better than in the 1993/94 operating season. For the first two weeks of operation, the OUR readings were low (less than 1 mg/L) indicating that the microbial system was in the development phase. Once the system was stabilized, OUR showed a definite increase and throughout the operating season they were typically in the expected range of 2 to 5 mg/L, with a few in the 7-9 range. This is attributed to the more aggressive operation of the sludge shear pump, which provided more "food." Figure 4-5 graphically presents the daily DO and OUR measurements.

FIGURE 4-4 PLATTY KILL POND BIOREMEDIATION
PH FIELD RESULTS (MAY - JUNE 1995)
BAYONNE INDUSTRIES, INC, BAYONNE, NEW JERSEY

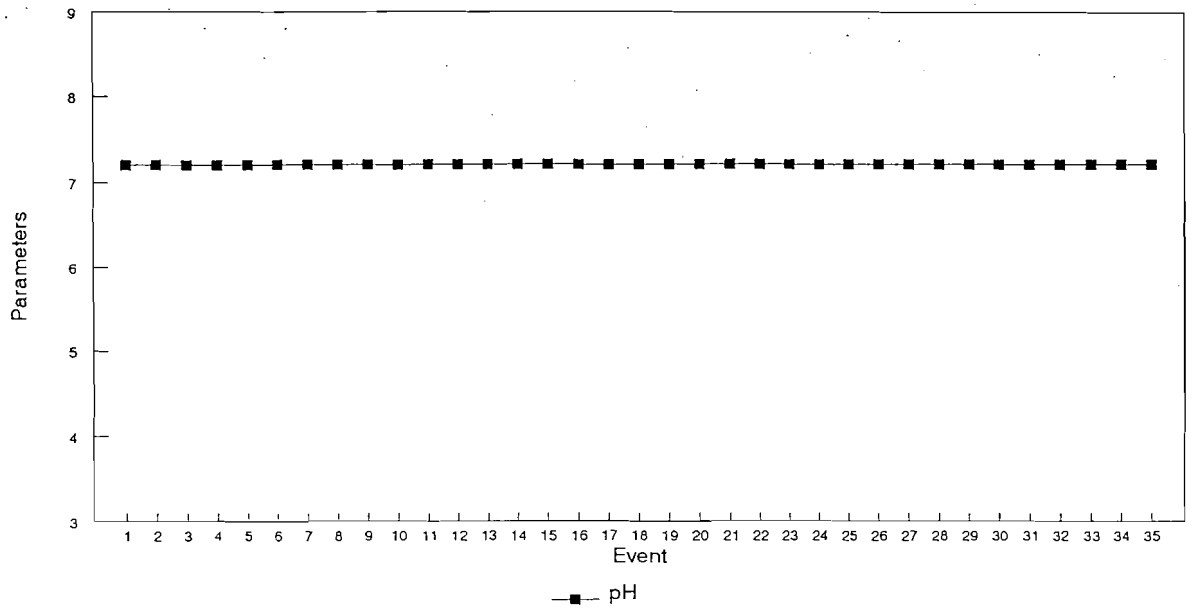


FIGURE 4-4 PLATTY KILL POND BIOREMEDIATION
pH FIELD RESULTS (JUNE - JULY 1995)
BAYONNE INDUSTRIES, INC, BAYONNE, NEW JERSEY

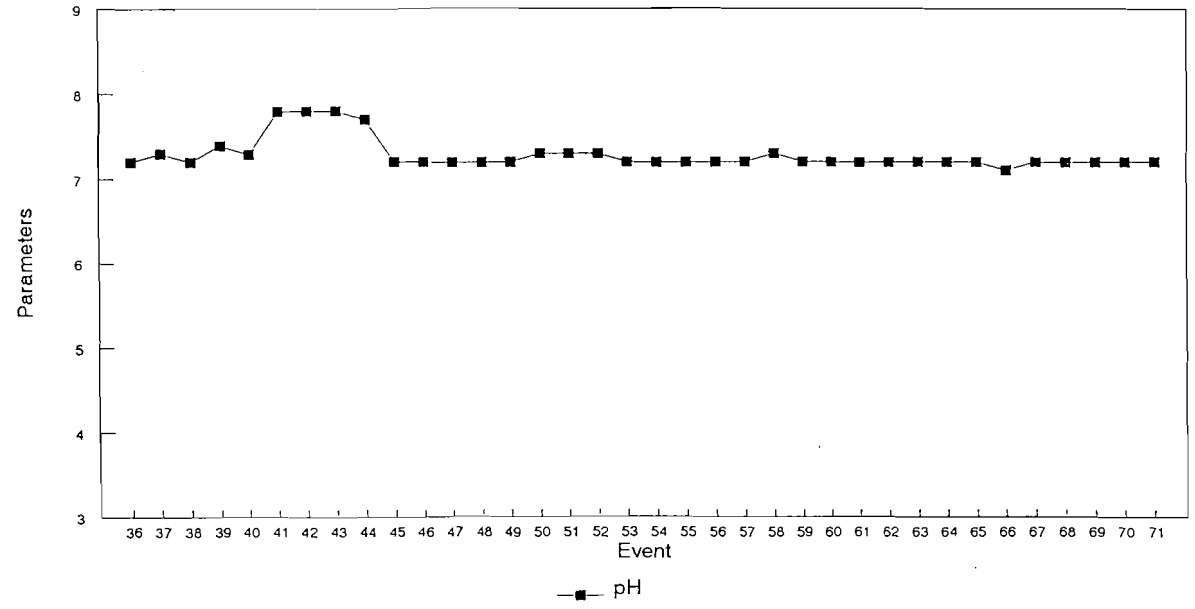


FIGURE 4-5 PLATTY KILL POND BIOREMEDIATION
DISSOLVED OXYGEN AND OXYGEN UPTAKE RESULTS (MAY-JUNE 1995)
BAYONNE INDUSTRIES, INC, BAYONNE, NEW JERSEY

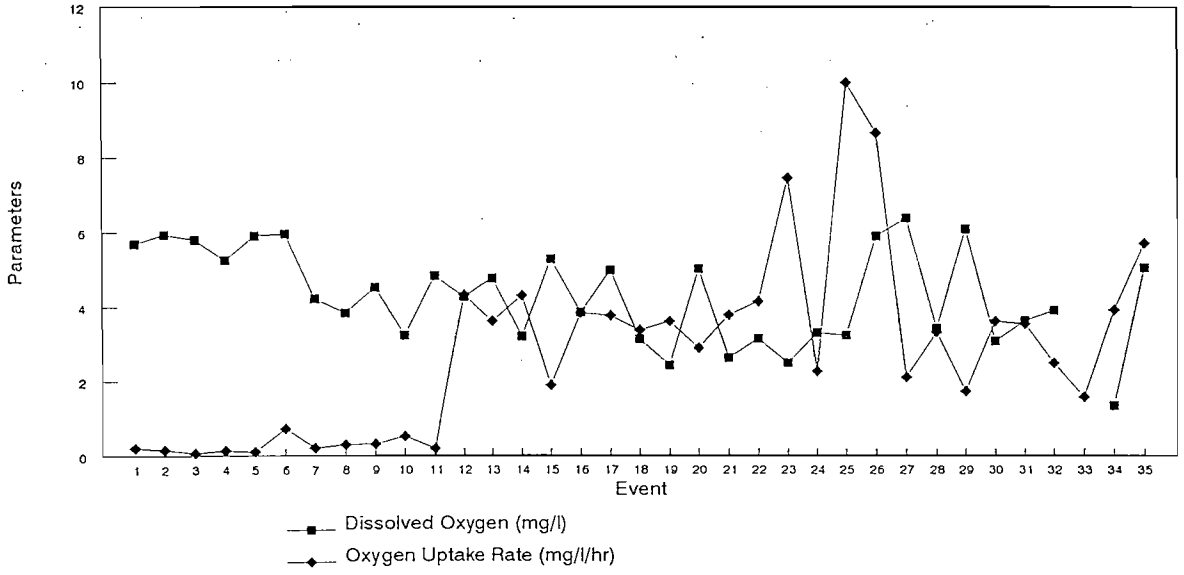
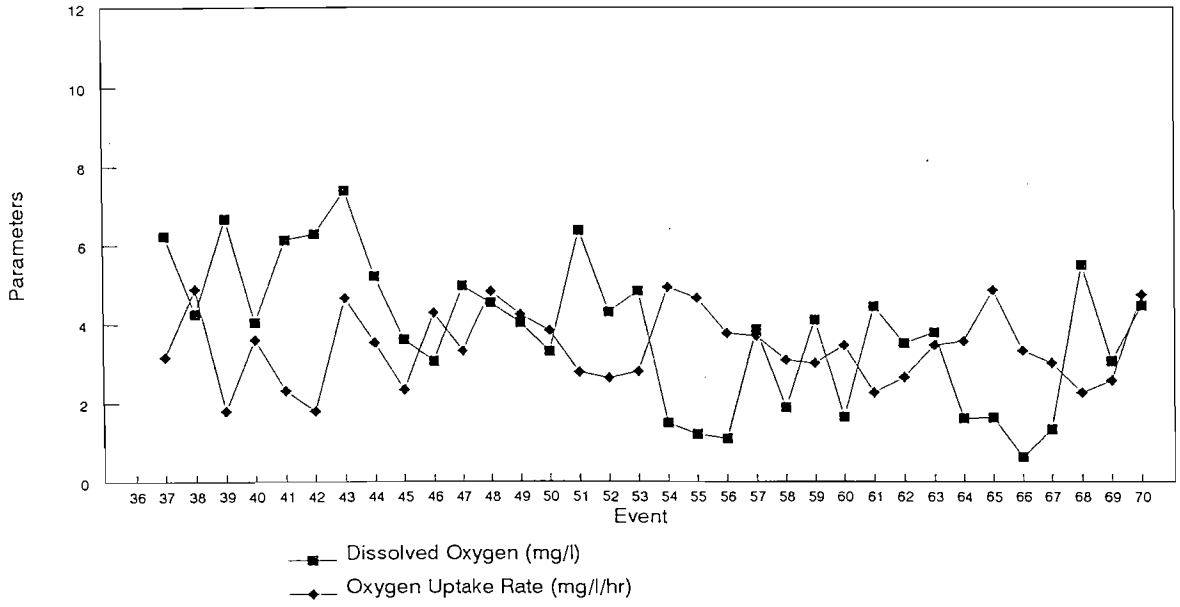


FIGURE 4-5 PLATTY KILL POND BIOREMEDIATION
DISSOLVED OXYGEN AND OXYGEN UPTAKE RESULTS (JUNE-JULY 1995)
BAYONNE INDUSTRIES, INC, BAYONNE, NEW JERSEY



4.2.2.2 Nitrogen Measurements

Historically, the addition of urea to the pond has been limited because the pond water was high in ammonium. In 1994, for the first time since the implementation of bioremediation system, low levels of ammonium in the water (less than 20 mg/L) were noted, indicating that the original ammonium had been converted to nitrates and/or biomass. Since then urea has been used to increase the level of ammonium in the pond water.

In the 1995 operating season, the ammonia-nitrogen levels increased gradually from 2 mg/L on May 18, at the beginning of the operating season, to a seasonal high of 23 mg/L on June 21. For most of the operating season, ammonia levels remained fairly consistent, ranging between 10 and 20 mg/L. Figure 4-6 graphically presents the daily ammonia-nitrogen measurements. The ammonia-nitrogen field test results were noted to be consistent with the weekly laboratory results. The target concentration of 50 mg/L was not attained in the 1995 operating season, even with significant additions of urea. This may be indicative of either appreciable microbial activity or the formation of nitrates. However, the weekly laboratory results do not show a significant increase in the nitrate formation. This corroborates the increased OUR values as evidence of the positive impact of increased shearing.

4.2.2.3 Phosphate Measurements

In the first two weeks of operation, phosphate levels remained less than 1 mg/L, even with the addition of phosphate. Later in the season, the phosphate concentration ranged typically from 1 to 5 mg/L, frequently exceeding the goal of 2 mg/L. Figure 4-7 graphically presents the daily phosphate measurements. Daily field test results for phosphate were consistent with weekly laboratory results. Generally, phosphate concentrations were higher than those measured during the 1994 operating season. On some days, notable differences in phosphate concentrations in the 8-hour operating period were observed. This has been observed in prior seasons, and is likely due to calcium precipitation of the phosphate.

4.3 Weekly Laboratory Monitoring Results

ENSR collected 14 sets of weekly water samples for laboratory analysis, encompassing 11 weekly sampling events. Samples were collected from a sampling system installed by ENSR in the 1994 operating season. This sampling system allows for the collection of samples diagonally across the pond. Two sets of aqueous samples from two different locations on the pond were collected each week and submitted to the laboratory for analysis. An analytical parameter set consisted of biological oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), total suspended solids (TSS), volatile suspended solids (VSS), nitrate, ammonia,

FIGURE 4-6 PLATTY KILL POND BIOREMEDIATION
AMMONIA FIELD RESULTS (MAY – JUNE 1995)
BAYONNE INDUSTRIES, INC, BAYONNE, NEW JERSEY

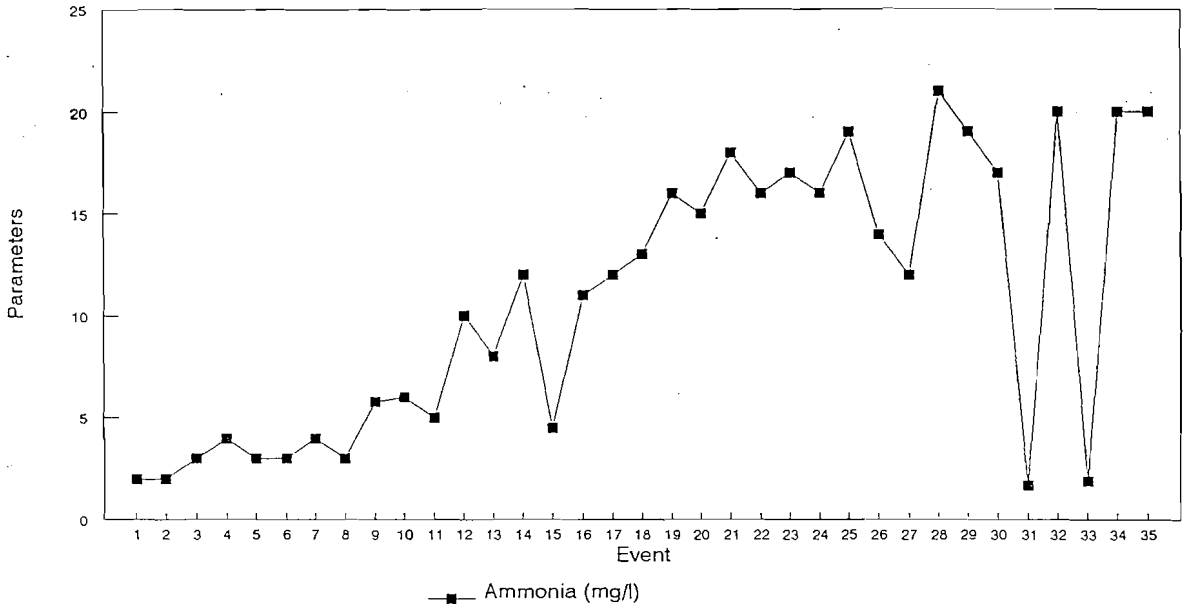


FIGURE 4-6 PLATTY KILL POND BIOREMEDIATION
AMMONIA FIELD RESULTS (JUNE-JULY 1995)
BAYONNE INDUSTRIES, INC, BAYONNE, NEW JERSEY

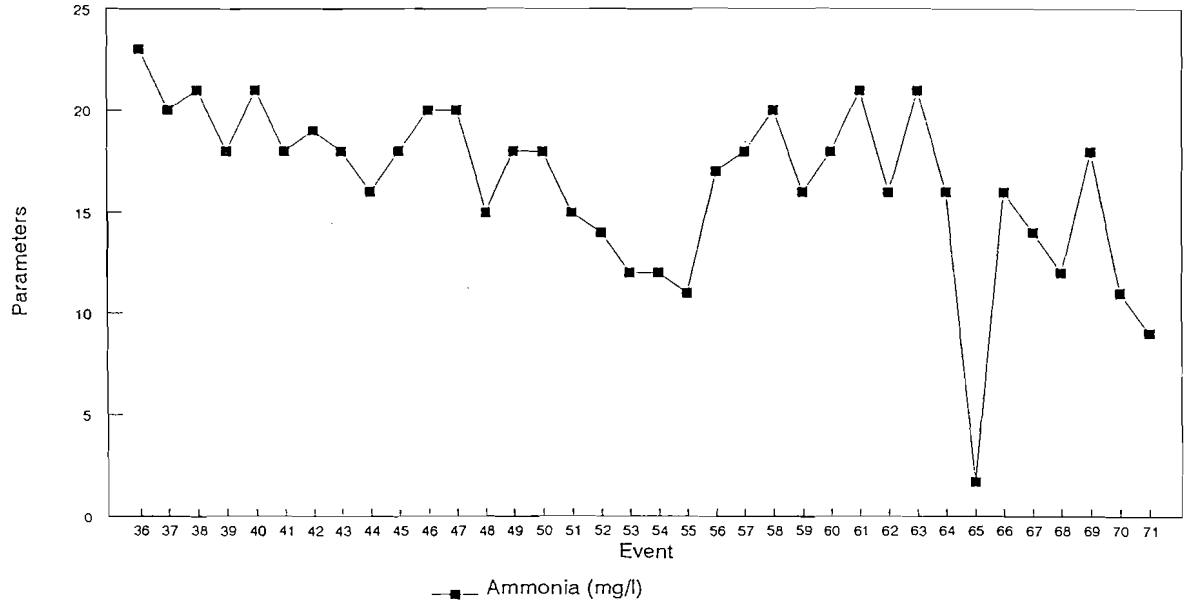


FIGURE 4–7 PLATTY KILL POND BIOREMEDIATION
PHOSPHATE FIELD RESULTS (MAY – JUNE 1995)
BAYONNE INDUSTRIES, INC, BAYONNE, NEW JERSEY

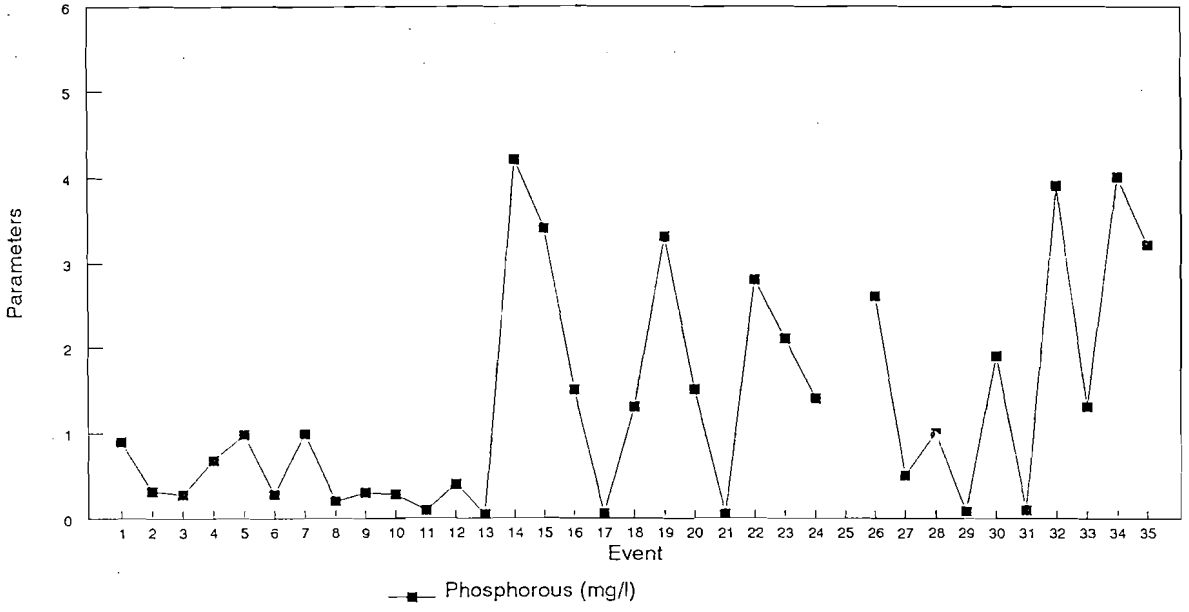
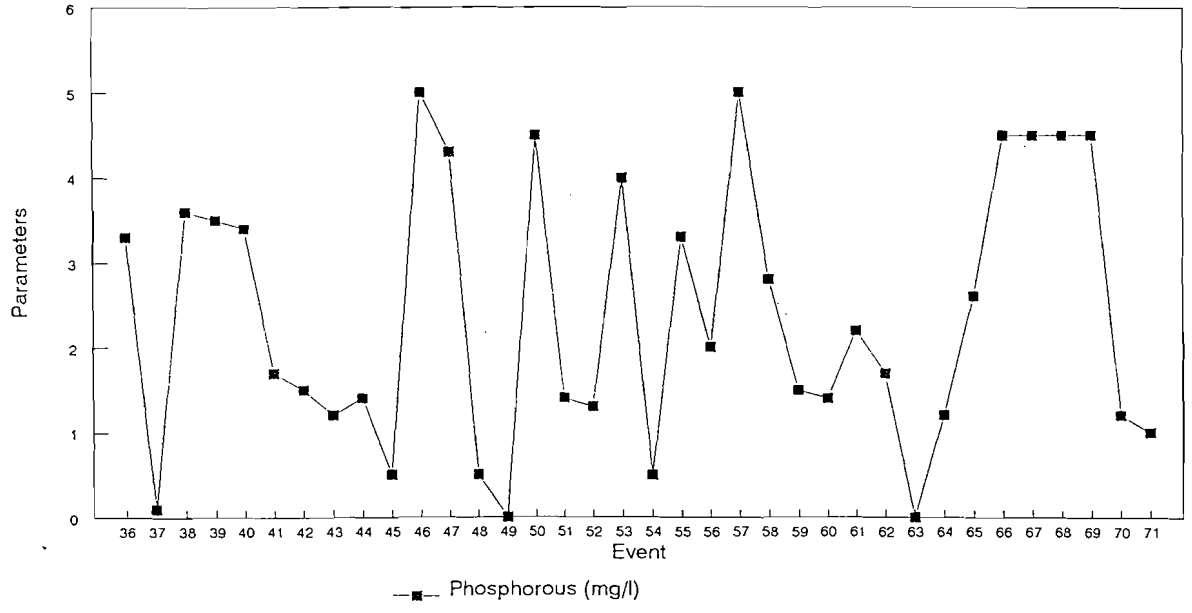


FIGURE 4–7 PLATTY KILL POND BIOREMEDIATION
PHOSPHATE FIELD RESULTS (JUNE–JULY 1995)
BAYONNE INDUSTRIES, INC, BAYONNE, NEW JERSEY



ortho-phosphate, and chloride. A summary of weekly laboratory results is presented in Table 4-3. Results of these analyses were used to monitor the biological activity in the pond.

4.3.1 Dissolved Solids and Chloride Measurements

The TDS concentrations remained fairly constant during the 1995 operating season, ranging from a low of 1,300 to high of 19,000 mg/L, with the majority of results falling in the 12,700 to 17,700 mg/L range. High TDS concentrations are believed to derive from the time when the pond was hydraulically connected to the Platty Kill Canal and thus the Kill Van Kull. These TDS results were somewhat lower on average than those seen in the 1994 operating season. In the past, precipitation (rain) events have been observed to significantly reduce the TDS concentrations in the pond.

The chloride concentrations were fairly consistent through out the abbreviated season. The chloride results for the June 13, and June 26, samples show considerable deviations from the other chloride concentrations measured, and are therefore questionable. The remaining are similar to those seen in previous seasons. Although the results are variable, the chloride and TDS results indicate a gradual drop in concentrations over the shortened season. Figure 4-8 graphically presents the TDS and chloride measurements.

4.3.2 Suspended Solids Measurements

Suspended solids in the water column are made up of micro-organisms, biodegradable suspended solids, and inert suspended solids. The results of the TSS measurements should therefore be the sum of all of these factors. In the Platty Kill Pond, the biodegradable and inert suspended solids concentration is dependent primarily on the shearing action of the sludge pump.

The TSS levels measured in the 1995 operating season ranged from 68 to 240 mg/L, and VSS levels ranged 28 to 85 mg/L. An upswing in the TSS levels were noted between sampling event numbers 5 and 8. The results of the VSS measurements also show an upswing at approximately the same timeframe. The increase in VSS does not account for the overall increase in TSS, suggesting that an increase in biomass is not the only effect. OUR did not show a notable increase in this timeframe, so the primary increase in TSS was likely due to an increase in inert solids concentrations due to increased sludge loading. Figure 4-9 graphically presents the weekly TSS and VSS measurements.

TABLE 4-3
1995 Weekly Monitoring Results
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Event	Date	TSS	TDS	TOC	COD	BOD	VSS	Nitrate	Ortho-Phosphate	Ammonia	Chloride
1	6/13/95	97.0	17,300	32	227	16	37	0.29	2.00	7.6	180
2	6/13/95	115.0	17,200	36	224	14	41	0.34	2.00	6.7	170
3	6/20/95	87.0	17,700	40	285	14	40	0.10	0.74	20	9,200
4	6/20/95	88.0	16,900	37	220	14	40	0.11	0.56	21	9,600
5	6/26/95	240.0	18,800	70	477	34	57	0.39	1.20	17	185,000
6	6/26/95	230.0	19,000	46	370	32	78	0.38	1.10	14	150,000
7	7/10/95	177	16,600	35	246	25	85	0.52	2.90	7.9	8,700
8	7/10/95	167	16,100	31	240	25	79	0.49	5.30	18	8,700
9	7/14/95	85	12,980	26	172	6	46	0.30	0.35	16	6,820
10	7/14/95	75	12,760	28	159	3	41	0.35	0.35	16	6,820
11	7/18/95	84	9,600	46	177	22	46	0.49	0.36	8.8	5,050
12	7/18/95	108	13,100	30	250	206	52	0.53	0.25	8.9	5,140
13	7/28/95	100.0	1300	29	186	15	44	0.30	1.9	15	6640
14	7/28/95	68.0	9100	27	167	48	28	0.26	2.0	15	6560

TSS – Total Suspended Solids.
TDS – Total Dissolved Solids.
COD – Chemical Oxygen Demand.
BOD – Biochemical Oxygen Demand.
VSS – Volatile Suspended Solids.
Note: All results expressed in parts per million (ppm).

Figure 4–8
1995 Weekly TDS/Chloride Monitoring Results
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

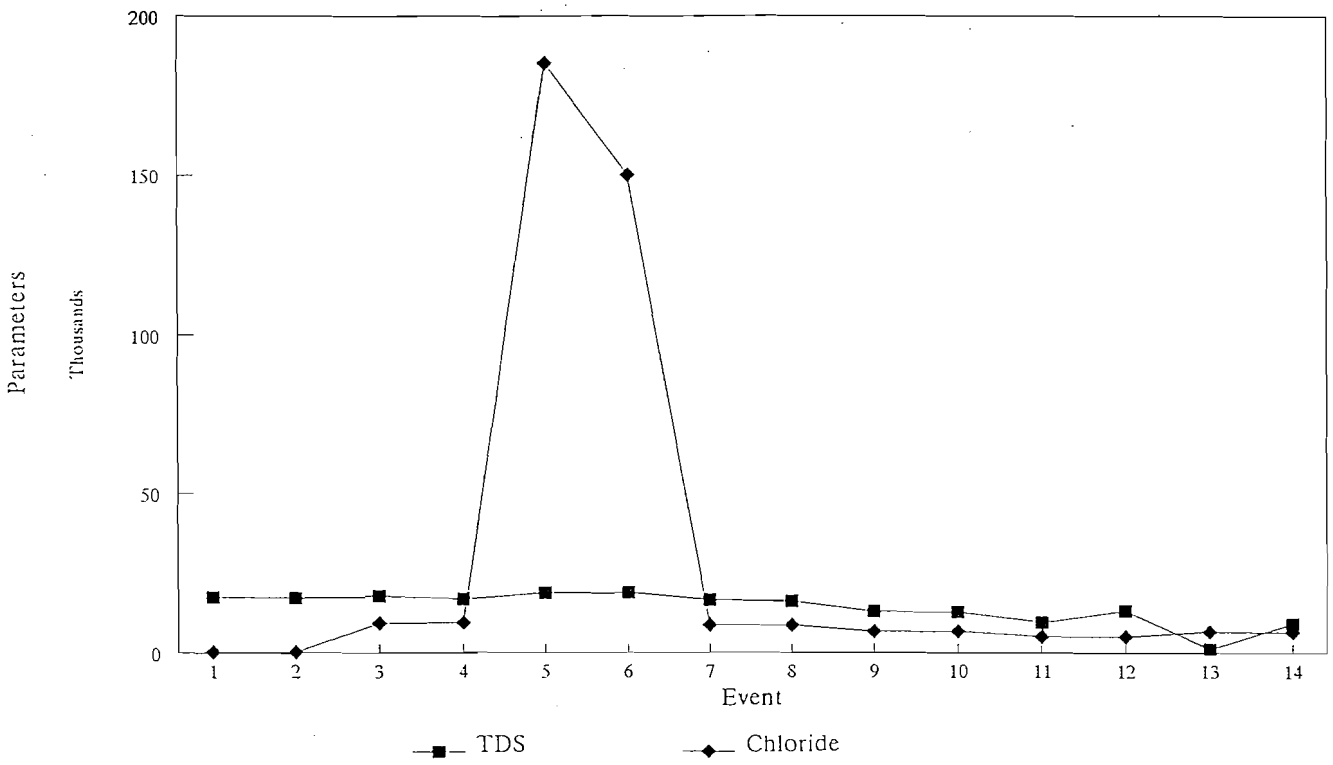
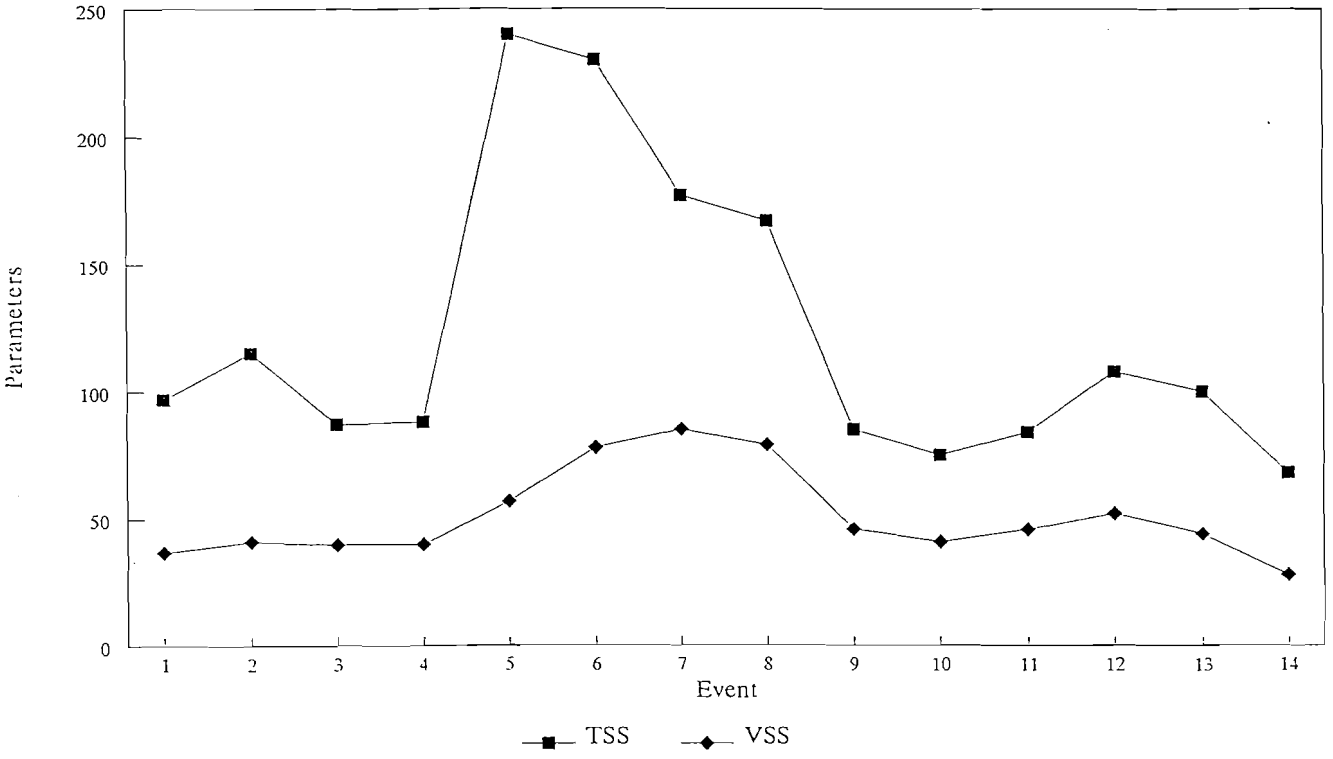


Figure 4–9
1995 Weekly TSS/VSS Monitoring Results
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey



4.3.3 TOC, BOD and COD Measurements

TOC results provide a quantitation of organic carbon while BOD and COD are indirect indicators of carbon based on oxygen consumption during biological and chemical oxidation respectively.

During the 1995 operating season, TOC levels ranged from 26 to 70 mg/L, with the majority of in the 26 to 46 mg/L range. These were slightly higher than those in the 1994 operating season. The COD levels ranged from 159 to 477 mg/L, typically ranging between 200 to 300 mg/L. The BOD levels ranged from 3 to 206 mg/L with the majority of the measurements ranging from 14 to 34 mg/L. The BOD value of 206 mg/L corresponds to a TOC reading on the same sample of 30 mg/L, so the accuracy of the BOD value for that sample is questionable. Both BOD and COD measurements were in approximately the same range as in 1994. Figure 4-10 graphically presents the weekly TOC, BOD, and COD measurements.

For the most part in 1995, these indicators did not show any major trends. This is potentially caused by a more aggressive sludge shearing program at the outset of the season, with sufficient organic material lifted into the water column that the loss of the sludge pump did not impact the biomass until after the system was shut down for the season.

As further evidence of this possibility, the OUR showed that the bioremediation system stabilized after the first two weeks of operation, resulting in moderately enhanced microbial activity. Since this activity did not reflect a substantial lowering of BOD values, it is reasonable to deduce that the shearing action provided by the sludge pump resulted in partitioning of organic matter in the aqueous phase.

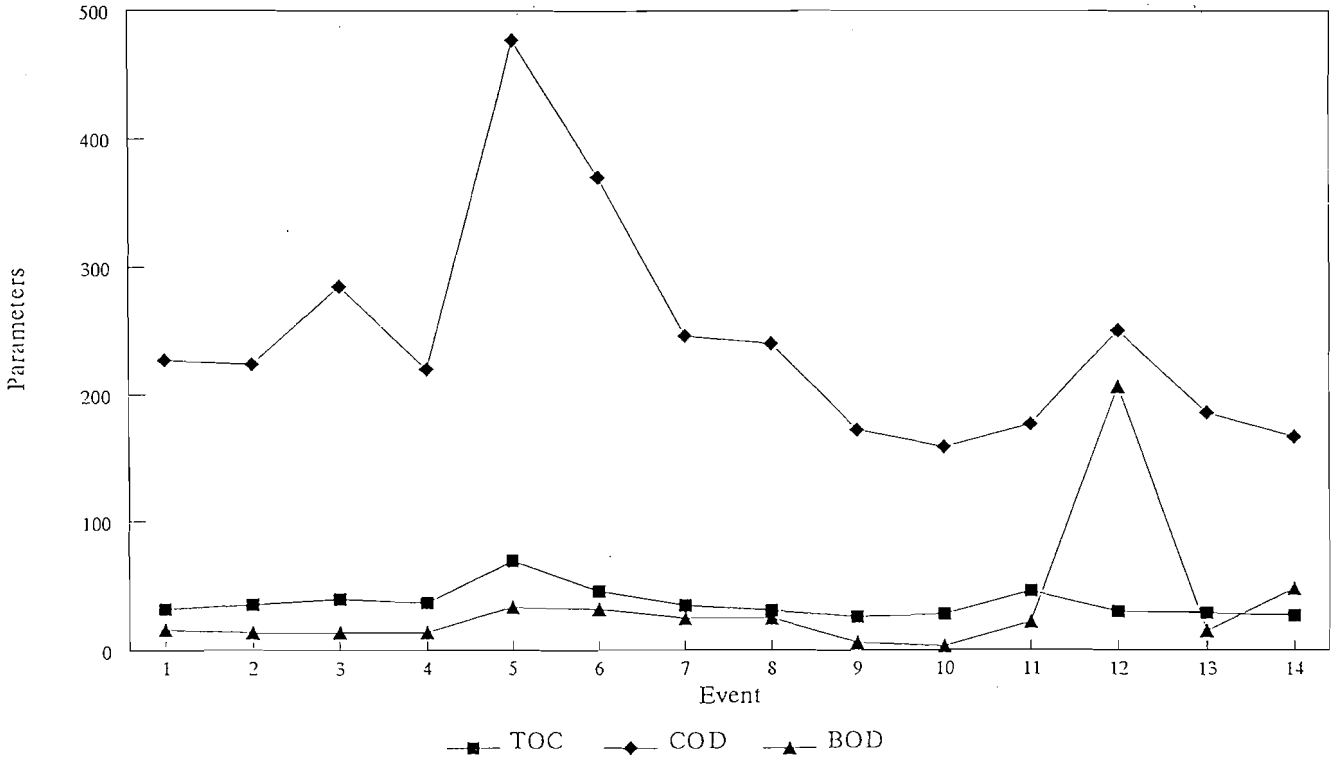
4.4 Aqueous and Sludge Analytical Results

ENSR collected two sets of aqueous and sludge samples during the abbreviated 1995 operating season. The first set of samples was collected in May 1995 at the beginning of the operating season, and the second set was collected in August 1995 at the end of the abbreviated operating season. The collection procedures are described in Section 3.1.3.

Each set of samples were analyzed for target compound list (TCL) volatile and semi-volatile organic compounds, target analyte list (TAL) metals, and TPH. These samples were analyzed by Industrial Environmental Analysts (IEA), Whippany, New Jersey, laboratory certification #14530.

Both sets of data were validated by ENSR's data validation group in Acton, Massachusetts. In general the data were found to be valid and may be used for decision making purposes. The

Figure 4–10
1995 Weekly TOC/COD/BOD Monitoring Results
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey



validated laboratory analytical summary pages for the May 1995 data are provided in Appendix A; and August 1995 in Appendix B.

Tables 4-4 and 4-5 present a summary of the TCL and TAL analytical results of the sludge and aqueous samples collected in May 1995 at the start of the operating season; and Tables 4-6 and 4-7 present a summary of data for the samples collected in August 1995 at the end of the operating season. For evaluation purposes we have provided the NJDEP Impact to Soil Criteria on the August 1995 sludge sample analytical summary table (Table 4-6). Table 4-8 provides a comparison of the December 1994 and August 1995 average sludge sample contaminant concentrations and the percent reduction of each compound. Table 4-9 provides a comparison of the May 1990 and August 1995 average sludge sample contaminant concentrations and the percent reduction of each compound. Table 4-10 presents a summary of the TPH results for all sampling events from June 1993 through August 1995. Figure 4-11 graphically presents the average TPH concentrations from 1989 through August 1995.

The TCL organics and TAL inorganics data for the sludge samples indicate very little difference in individual contaminant concentrations from the start of the 1995 season to the end of the abbreviated season in July. This is once again most likely attributable to the abbreviated operating season, and the fact that the system operated with only one aeration unit during that time. The data strongly suggests the existence of hot spots within the sludge, and that the sludge is not uniformly mixed or treated. Good progress has been made in some areas, but others require additional treatment.

A comparison of the August 1995 results to the New Jersey Impact to Groundwater Soil Clean-up Criteria, as presented in Table 4-6, indicate that most contaminants at each of the four sample locations are below their respective clean-up criteria, for those contaminants that have criteria. A comparison of the December 1994 and August 1995 average contaminant concentrations, as presented in Table 4-8, indicate very little change between the end of the 1994 and 1995 seasons. However, a comparison of the May 1990 and August 1995 average contaminant concentrations, as presented in Table 4-9, indicates a significant reduction in average compound concentrations over the lifetime of the project. The persistence of the volatile organic compounds suggests poor mixing of the sludge or the presence of a continuing source (i.e. free-phase product).

Average TPH concentrations of sludge samples collected in May 1995 at the beginning of the season, were similar to TPH concentrations at the end of the 1994 season. The 1995 results basically confirm the results indicated at the end of the 1994 season. Average TPH concentrations of the sludge samples collected in August at the end of the abbreviated season were essentially the same, although slightly higher than those collected in May. Once again the

Table 4-4
MAY 1995 SLUDGE SAMPLE RESULTS SUMMARY
PLATTY KILL POND BIOREMEDIATION PROJECT
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

	SAMPLE ID				
VOLATILE ORGANICS	Y9-ES1-SLU-16	Y9-ESI-SLU-17	Y9-ESI-SLU-18	Y9-ESI-SLU-19	Y9-ESI-SLU-20
Benzene	41	12J	8.8J	4.1	50
Chlorobenzene	600	8.9J	4.2J	28	160
Ethylbenzene	70	41	33	24	47
Toluene	91	16U	16U	2.4J	4.3
Total Xylenes	250	8.8J	20	63	130
SEMIVOLATILE ORGANICS					
1,3-Dichlorobenzene	140	26U	26U	4.1J	14J
1,4-Dichlorobenzene	240	26U	26U	7.8J	28
1,2-Dichlorobenzene	220	4J	26U	20U	41
Naphthalene	720	100	120	82	690
2-Methylnaphthalene	700	250	280	130	610
Acenaphthene	170	34	40	30	170
Acenaphthylene	56	26U	14J	20U	46
Anthracene	88	29	34	28J	93
Benzo(a)Anthracene	50	20J	21J	20	48
Benzo(a)Pyrene	36J	13J	14J	14J	38J
Benzo(b)Fluoranthene	24J	9.3J	26UJ	20UJ	29J
Benzo(g,h,i)Perylene	9.5J	26UJ	7.3J	4.2J	11J
Benzo(k)Fluoranthene	12J	4.4J	26UJ	20UJ	14J
Bis(2-Ethylhexyl)Phthalate	74	100	120J	200	100
Butylbenzylphthalate	5J	26U	3.5J	20U	7.8J
Chrysene	65	32	32J	35	62
Di-n-Octylphthalate	44J	82J	96J	270J	100J
Dibenzofuran	43	26	29	14J	35
Fluoranthene	70	23J	27	30J	87
Fluorene	160	57	65	44	120
Indeno(1,2,3-cd)Pyrene	5.7J	26UJ	26UJ	20UJ	20UJ
Isophorone	20U	26U	26U	20U	22
N-Nitrosodiphenylamine	86	26U	26U	20UJ	81
Phenanthrene	370	170	200	130J	340
Pyrene	150	63	71	60	150
INORGANICS					
Aluminum	5750	10300	7180	7680	4940
Antimony	15.6	10.1	9.4	13.3	10.2
Arsenic	329	490	833	261	168
Barium	994	648	490	285	512
Beryllium	0.51	0.78	0.68	0.59	0.4
Cadmium	1.8	4.6	4	2	1.3
Calcium	15300	10800	9470	8250	8440
Chromium	265	364	273	196	165
Cobalt	40	61.4	63.4	21.2	24.4
Copper	1580	3130	2420	4010	1690
Iron	102000	76500	77100	62700	85400
Lead	6670	16900	26600	4480	3360
Magnesium	6850	8120	6960	6800	5740
Manganese	496	403	392	323	406
Mercury	2.8	6.4	8.5	3.4	3.4
Nickel	167	128	175	86.7	206
Potassium	1240	2250	1580	1160	1040
Selenium	0.95	3.9	3.2	0.86 B	0.86
Silver	0.42	1.9	1.8	0.21U	0.21
Sodium	5960	9350	8440	5130	6970
Vanadium	90.3	164	136	110	72.6
Zinc	1110	913	836	641	518

All results expressed in parts per million (ppm)
* = Duplicate samples
J = Estimated value due to QC nonconformance, or values less than reporting limits.
B = Analyte also found in the blank (laboratory blank or field blank).
U = Undetected at the reporting limit.
Neg = Negated Value

TABLE 4-5
MAY 1995 AQUEOUS SAMPLE RESULTS SUMMARY
PLATTY KILL POND BIOREMEDIATION PROJECT
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

Volatile Organics	Y9-ESI-SW-08*	Y9-ESI-SW-09*
Benzene	120	120
Chlorobenzene	600	640
Ethylbenzene	120	130
Toluene	94	110
Total Xylenes	140	170
Semivolatile Organics		
1,2-Dichlorobenzene	10 J	10U
1,3-Dichlorobenzene	28	11
1,4-Dichlorobenzene	57	12
2-Methylnaphthalene	9 J	10U
Acenaphthene	7 J	10U
Anthracene	2 J	10U
Benzo(a)Anthracene	2 J	10U
Bis(2-Ethylhexyl)Phthalate	21	29
Carbazole	2 J	10U
Chrysene	2 J	2 J
Di-n-Octylphthalate	8 J	6 J
Diethylphthalate	10U	1 J
Fluoranthene	2 J	10U
N-Nitrosodiphenylamine	2 J	1 J
Naphthalene	5 J	2 J
Phenanthrene	9 J	2 J
Pyrene	6 J	4 J
Inorganics		
Aluminum	2020	1910
Antimony	17	15.4
Arsenic	79.4	78.4
Barium	165	163
Beryllium	1.6	1.5 JB
Calcium	207000	205000
Chromium	52.6	52.2
Cobalt	3.1 JB	3.2 JB
Copper	1130	1120 J
Iron	6960	6780
Lead	682	672
Magnesium	651000	648000
Manganese	336	333
Mercury	4.8	0.77
Nickel	31	29.1
Potassium	257000	257000
Sodium	7020000 J	7020000 J
Thallium	7.8 B	9.2 B
Vanadium	24.7	24
Zinc	94.4 J	99.8 J

All results expressed in parts per billion (ppb).
* = Duplicate samples
J = Estimated value due to QC nonconformance, or values less than reporting limits.
B = Analyte also found in the blank (laboratory blank or field blank).
U = Undetected at the reporting limit.
Neg = Negated Value

Table 4–6
August 1995 Sludge Sample Results Summary
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

	Sample ID					NJ Impact To GW
Volatile Organics	Y9–ESI–SLU–21	Y9–ESI–SLU–22	Y9–ESI–SLU–23	Y9–ESI–SLU–24	Y9–ESI–SLU–25	Soil Criteria
Benzene	56	14	25	39	43	1
Chlorobenzene	140	33	41	180	220	1
Ethylbenzene	190	90	64	53	100	100
Toluene	430	13U	330	150	460	500
Total Xylenes	610	54	86	140	290	10
Semi–Volatile Organics						
1,3–Dichlorobenzene	20J	3.0J	23U	19	11J	100
1,4–Dichlorobenzene	30	5.4J	23U	32	20	100
1,2–Dichlorobenzene	23	5.6J	4.9J	34	27	50
Naphthalene	340	140	98	650	460	100
2–Methylnaphthalene	360	330	300	850	650	NS
Acenaphthylene	31	21U	4	80	46	NS
Acenaphthene	96	28	30	87	53	100
Dibenzofuran	22U	21U	16J	18U	19U	NS
Fluorene	79	49	44	140	79	100
Phenanthrene	240	140	92	490	260	NS
Anthracene	58	27	23U	84	56	500
Di–n–Butylphthalate	22U	21U	10J	18U	19U	100
Fluoranthene	61	24	9.2J	79	54	500
Pyrene	130	76	28	230	150	500
Benzo(a)anthracene	40	24	76J	71	46	500
Bis(2–ethylhexyl)phthalate	110	65	100	66	63	100
Di–n–octylphthalate	30	28	16J	25J	21J	100
Chrysene	34	25	10J	62	34	500
Indeno(1,2,3–cd)pyrene	6.1J	2.9J	23U	12J	96U	500
Benzo(g,h,i)perylene	11J	5.4J	23U	26J	15J	500
Benzo(b)fluoranthene	21J	13J	4.2J	46J	26J	500
Benzo(k)fluoranthene	608J	4J	23U	9.3J	96U	500
Benzo(a)pyrene	23	12J	4.7J	58J	30J	100
Metals						
Aluminum	6680	7160	9150	5640	5360	NS
Antimony	7.3	7.3	8.4	9.1	7.1	NS
Arsenic	266	507	264	214	222	NS
Barium	588	687	336	731	604	NS
Beryllium	0.57JB Neg	0.59JB Neg	0.68JB Neg	0.50JB Neg	0.51JB Neg	NS
Cadmium	5.5	5.4	3.6	5.5	7.9	NS
Calcium	11500	8620	11300	9410	10100	NS
Chromium	227	255	242	168	177	NS
Cobalt	30.9	35.6	22.4	37.8	41.3	NS
Copper	2530	2510	5140	1590	1290	NS
Iron	88700	69500	63600	100000	119000	NS
Lead	5130	12700	4050	4700	4440	NS
Magnesium	5790	6840	7460	4900	4470	NS
Manganese	446	337	288	450	499	NS
Mercury	1.7	1.4	0.23U	0.18U	0.19U	NS
Nickel	113	234	164	106	144	NS
Potassium	1420	1700	1730	997	973	NS
Selenium	3.6	5.5	3.2	3.1	3.6	NS
Silver	2.2JB	2.2JB	3.1	1.6JB	1.6JB	NS
Sodium	6490	7080	6120	4040	4440	NS
Thallium	3.1B Neg	2.4B Neg	2B Neg	2.4 B Neg	2.4B Neg	NS
Vanadium	109	114	101	116	97.1	NS
Zinc	626J	789J	598J	575J	634J	NS

All results expressed in parts per million (ppm)
** = Duplicate Samples
J = Estimated value due to QC nonconformance, or values less than reporting limits.
B = Analyte also found in the blank (laboratory blank or field blank).
U = Undetected at the reporting limit.
Neg = Negated Value

Table 4-7
August 1995 Aqueous Sample Results Summary
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organic Compounds	Y9-ESI-SW-10*	Y9-ESI-SW-11*
Acetone	10U	11
Benzene	2J	5U
Carbon Disulfide	1J	5U
Chlorobenzene	54	5U
Ethylbenzene	12	5U
Methylene Chloride	5U	5U
Toluene	3J	2J
Total Xylenes	28	5U
Semi-Volatile Organics Compounds		
Fluorene	5J	10U
1,4 Dichlorobenzene	50U	1J
Phenathrene	15J	10U
Bis(2-ethylhexyl)phthalate	73	1JB Neg
Fluoranthene	7J	10U
Chrysene	6J	10U
Di-n-Octylphthalate	16J	10U
Metals		
Aluminum	293B Neg	142B Neg
Arsenic	60.2	58.3
Barium	54.4	57.3
Beryllium	2.0JB Neg	2.3JB Neg
Calcium	206000	231000
Chromium	3.4B Neg	0.65U
Copper	113	10.8J
Iron	1140	409BJ
Lead	85.8	31.4U
Magnesium	724000	733000
Manganese	164	178
Nickel	32.2	3.4B Neg
Potassium	356000	368000
Sodium	5740000	5910000
Vanadium	5.8	4.2

All results expressed in parts per million (ppm).
* = Duplicate samples
J = Estimated value due to QC nonconformance, or values less than reporting limits.
B = Analyte also found in the blank (laboratory blank or field blank).
U = Undetected at the reporting limit.
Neg = Negated Value

Table 4–8
December 1994/August 1995 Sludge Sample Comparison
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organic Compounds	December 1994*	August 1995*	% Reduction
Benzene	70.5	35.4	49.79
Chlorobenzene	1496.8	122.8	91.80
Ethylbenzene	118.6	99.4	16.19
Toluene	95.0	274.0	-188.54
Total Xylenes	333.8	236.0	29.30
Semi-Volatile Organic Compounds			
1,2-Dichlorobenzene	17.0	18.9	-11.31
1,3-Dichlorobenzene	33.0	10.6	67.88
1,4-Dichlorobenzene	57.6	17.5	69.66
2-Methylnaphthalene	226.0	498.0	-120.35
Acenaphthene	44.0	58.8	-33.64
Acenaphthylene	11.2	32.2	-186.99
Anthracene	26.4	45.0	-70.71
Benzo(a)Anthracene	20.7	51.4	-148.31
Benzo(a)Pyrene	13.6	25.5	-87.24
Benzo(b)Fluoranthene	8.0	22.0	-174.81
Benzo(g,h,i)Perylene	7.1	11.5	-60.78
Benzo(k)Fluoranthene	6.6	4.0	39.27
Bis(2-Ethylhexyl)Phthalate	55.6	80.8	-45.32
Butylbenzylphthalate	ND	ND	---
Chrysene	22.4	33.0	-47.58
Di-n-Butylphthalate	ND	2.0	-100.00
Di-n-Octylphthalate	29.6	24.0	18.92
Dibenzofuran	11.7	3.2	72.70
Fluoranthene	29.4	45.4	-54.56
Fluorene	39.2	78.2	-99.49
Indeno(1,2,3-cd)Pyrene	6.3	4.2	33.54
Isophorone	15.2	ND	100.00
N-Nitrosodiphenylamine	ND	ND	---
Naphthalene	184.8	337.6	-82.68
Phenanthrene	124.2	244.4	-96.78
Pyrene	70.2	122.8	-74.93
Metals			
Aluminum	8318.0	6798.0	18.27
Antimony	10.0	7.8	21.60
Arsenic	418.0	294.6	29.52
Barium	581.8	589.2	-1.27
Cadmium	0.8	5.6	-588.89
Calcium	12026.0	10186.0	15.30
Chromium	270.4	213.8	20.93
Cobalt	27.9	33.6	-20.34
Copper	2262.0	2612.0	-15.47
Iron	106000.0	88160.0	16.83
Lead	6918.0	6204.0	10.32
Magnesium	7398.0	5892.0	20.36
Manganese	439.8	404.0	8.14
Mercury	1.7	0.6	63.10
Nickel	127.0	152.2	-19.88
Potassium	1384.0	1364.0	1.45
Selenium	2.4	3.8	-57.02
Silver	1.6	1.5	7.41
Sodium	5844.0	5634.0	3.59
Thallium	0.4	2.1	-368.18
Vanadium	176.4	107.4	39.10
Zinc	745.2	644.4	13.53

* Average Concentration of Five Sludge Samples Including Duplicate
All Values are Reported in Parts Per Million

Table 4-9
May 1990/August 1995 Sludge Sample Comparison
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Volatile Organic Compounds	May 1990*	August 1995**	% Reduction
Benzene	66.85	35.4	47.05
Chlorobenzene	654.67	122.8	81.24
Ethylbenzene	134.83	99.4	26.28
Toluene	352.3	274.0	22.23
Total Xylenes	380.83	236.0	38.03
1,1,1-Trichloroethane	0.52	ND	100.00
Tetrachloroeyhene	0.97	ND	100.00
Semi-Volatile Organic Compounds			
1,2-Dichlorobenzene	2839	18.9	99.33
1,3-Dichlorobenzene	443	10.6	97.61
1,4-Dichlorobenzene	801	17.5	97.82
2-Methylnaphthalene	NR	498.0	---
Acenaphthene	198	58.8	70.30
Acenaphthylene	69	32.2	53.33
Anthracene	91	45.0	50.55
Benzo(a)Anthracene	ND	51.4	-100.00
Benzo(a)Pyrene	46	25.5	44.48
Benzo(b)Fluoranthene	63	22.0	65.02
Benzo(g,h,i)Perylene	ND	11.5	-100.00
Benzo(k)Fluoranthene	ND	4.0	-100.00
Bis(2-Ethylhexyl)Phthalate	92	80.8	12.17
Chrysene	69	33.0	52.17
Di-n-Butylphthalate	ND	2.0	-100.00
Di-n-Octylphthalate	ND	24.0	-100.00
Dibenzofuran	ND	3.2	-100.00
Fluoranthene	90	45.4	49.51
Fluorene	212	78.2	63.11
Hexachloroethane	533	0	100.00
Indeno(1,2,3-cd)Pyrene	ND	4.2	-100.00
Naphthalene	751	337.6	55.05
Phenanthrene	485	244.4	49.61
Pyrene	161	122.8	23.73
Metals			
Aluminum	NR	6798.0	---
Antimony	NR	7.8	---
Arsenic	NR	294.6	---
Barium	NR	589.2	---
Beryllium	NR	0.0	---
Cadmium	NR	5.6	---
Calcium	NR	10186.0	---
Chromium	NR	213.8	---
Cobalt	NR	33.6	---
Copper	NR	2612.0	---
Iron	NR	88160.0	---
Lead	NR	6204.0	---
Magnesium	NR	5892.0	---
Manganese	NR	404.0	---
Mercury	NR	0.6	---
Nickel	NR	152.2	---
Potassium	NR	1364.0	---
Selenium	NR	3.8	---
Silver	NR	1.5	---
Sodium	NR	5634.0	---
Thallium	NR	2.1	---
Vanadium	NR	107.4	---
Zinc	NR	644.4	---

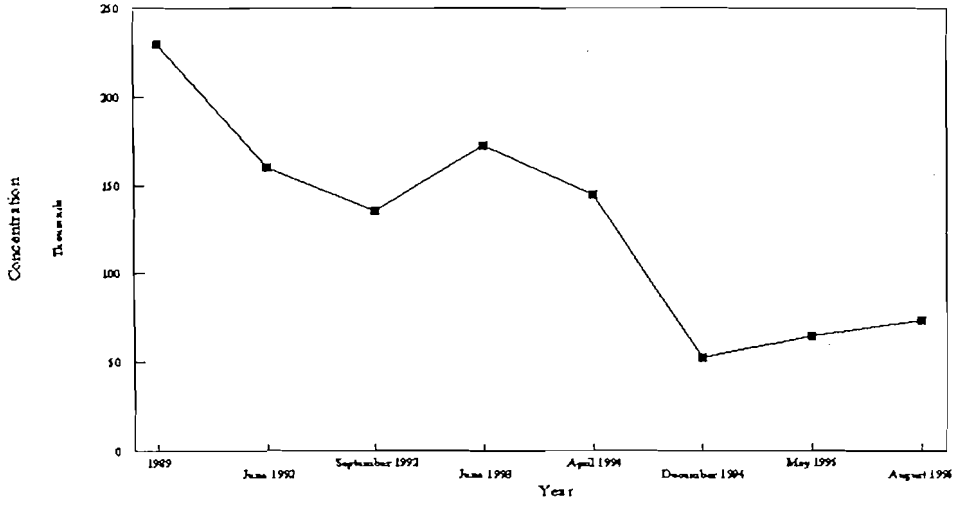
* Average Concentration of Five Sludge Samples Including Duplicate
** Average Concentration of Six Sludge Samples including Duplicate
All values are Reported in Parts Per Million
ND - Compound Not Detected
NR - Compound Not Reported

Table 4-10
1993/1994/1995 Sludge Sample TPH Results
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey

Date	Sample ID	TPH Concentration
June 1993	Y9-ESI-SLU-01**	170,000
	Y9-ESI-SLU-02	120,000
	Y9-ESI-SLU-03	210,000
	Y9-ESI-SLU-04	190,000
	Y9-ESI-SLU-05**	170,000
	AVERAGE	172,000
April 1994	Y9-ESI-SLU-06	135,000
	Y9-ESI-SLU-07	113,000
	Y9-ESI-SLU-08	198,000
	Y9-ESI-SLU-09**	143,000
	Y9-ESI-SLU-10**	134,000
	AVERAGE	144,600
December 1994	Y9-ESI-SLU-11	41,000
	Y9-ESI-SLU-12	66,000
	Y9-ESI-SLU-13	17,000
	Y9-ESI-SLU-14**	76,000
	Y9-ESI-SLU-15**	61,000
	AVERAGE	52,200
May 1995	Y9-ESI-SLU-16	139,000
	Y9-ESI-SLU-17	124,000
	Y9-ESI-SLU-18	9,100
	Y9-ESI-SLU-19	40,400
	Y9-ESI-SLU-20	10,300
	AVERAGE	64560
August 1995	Y9-ESI-SLU-21	60,000
	Y9-ESI-SLU-22	53,000
	Y9-ESI-SLU-23	78,000
	Y9-ESI-SLU-24	100,000
	Y9-ESI-SLU-25	74,000
	AVERAGE	73,000

All results expressed in parts per million (ppm)
** - denotes duplicate samples

Figure 4-11
1990 - 1995 Sludge Sample TPH Results
Platty Kill Pond Bioremediation Project
Bayonne Industries, Inc.
Bayonne, New Jersey



variability of the TPH concentrations between each sample location for each set of data collected strongly suggest poor mixing of the sludge.

Aqueous results from samples collected in May at the beginning of the season were significantly higher than those indicated in the samples collected in August at the end of the season. These differences in results are attributable to the system being operational in May when the samples were collected, and the system having been shut down in July and the pond allowed to settle for approximately one month prior to collection of the samples at the end of the abbreviated season.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The results from the abbreviated 1995 operating season indicate that the bioremediation system remains capable of degrading hydrocarbons; however, the abbreviated 1995 season coupled with the almost two years the system remained inactive due to the air permit process, has allowed the system to operate for only a total of 141 days over a three year period. The operating equipment sitting idle in the brackish pond water for the majority of the three year period resulted in the failure of the three main pieces of operating equipment.

In general it can be concluded that the bioremediation process has achieved the goals predicted during the treatability study and that the system can be potentially shut down. However, the sample results indicate a significant variability in the contaminant concentrations indicating that there is not a homogenous mix of the sludge in the pond, and possible inconsistency in sampling technique. In addition the configuration of the bioremediation equipment over the last two operating seasons has not allowed sludge along the bulkhead walls of the pond, and from behind the former baffles that were present in the pond, to be moved into the center of the pond for effective treatment.

The results indicate at least one more operating season is required to further reduce the contaminant levels and get a more homogenous mix of the sludge in the pond. To address these issues the following is recommended to be implemented over the course of the 1996 operating season:

- A small portable dredge and operator will be contracted to move sludge from the perimeter of the pond into the center and mix the sludge prior to starting treatment for the season. The sludge will be permitted to resettle prior to initiating bioremediation activities, since an immediate start could cause toxicity concerns from overloading the water column. This activity will also serve to initially expose the bottom sludge to oxygen and simplify the initial seasonal conversion of the pond to aerobic conditions. This dredging operation will be repeated halfway through the operating season.

- Following the first dredging operation and at the end of the operating season, sludge samples will be collected from the pond using vibracoring techniques. This technique will allow for a full column of sludge, from the top of the sludge layer to the bottom of the pond, to be collected and analyzed, and will eliminate the potential inconsistency in the sampling technique.

- The repairs and reinstallation of the aerators and the sludge pump will be completed, and the system, particularly the movement of the sludge pump will be operated aggressively during the 1996 season.

ENSR believes operation of the bioremediation system for one more full season is needed to sufficiently reduce the remaining compounds of concern in the existing sludge to permit closure steps to commence for the pond. Closure activities for the pond, including a proposal for Alternate Clean-up Criteria and continued operation of the unit to treat sediments from the Platty Kill Canal, will be provided to the MOA Case Management Team in a separate document for review and approval.

Schedule

The proposed schedule for the 1996 operating season is provided below:

- April 1996 - Complete repairs on operating equipment and prepare to reinstall them into the pond. Perform sludge profile.

- May 1996 - Week one and two, subcontract the services of a portable dredge to uniformly mix the sludge in the pond. Week three, conduct sludge sampling using vibracore, re-install all of the operating equipment, and start up system. In addition to samples collected for TPH, TCL, and TAL analysis, collect one composite sample for TCLP analysis.

- July 1995 - Subcontract the services of the portable dredge to do mid-season mixing of the sludge (one week). Perform sludge profile following completion of dredge activities. Collect sludge samples for TPH analysis.

- November 1996 - Week one, shut down system. Perform end of year sludge profile, collect end of year sludge samples using vibracore. In addition to samples collected for TPH, TCL, and TAL analysis, collect one composite sample for TCLP analysis.

Bayonne Industries, Inc.

Bayonne, New Jersey

ENSR

Platty Kill Canal Interim Remedial Action Report

Volume I

ENSR Consulting and Engineering

November 1995

Document Number 3782-009-122

CCA000023

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1.0 INTRODUCTION

This Interim Remedial Action (IRA) Report was prepared by ENSR Consulting and Engineering (ENSR) on behalf of Bayonne Industries, Inc., to document investigation and interim remedial actions that were conducted to control petroleum seepage from the Bayonne Industries site, into the Platty Kill Canal and Kill Van Kull waterways at the southeast corner of the site. This IRA was implemented in accordance with the New Jersey Department of Environmental Protection (NJDEP) approved, Platty Kill Canal Interim Remedial Action Work Plan, dated April 1994. The impetus for this work was a directive issued in July 1993 by the United States Coast Guard (USCG) to Bayonne Industries to initiate petroleum seepage control measures.

This IRA Report includes a discussion on: (1) the reconstruction of the bulkhead along the Platty Kill Canal outside of the dam that separates the Platty Kill Canal from the Kill Van Kull, (2) an investigation to characterize the sediment of the Platty Kill Canal, (3) the installation of a subsurface retainage wall (curtain) to abate the migration of free-phase product into the Kill Van Kull, and implementation of an interim free-phase product recovery program in the area adjacent to the Platty Kill Canal, and (5) the installation of an air curtain barrier outboard of the sheetpile dam to control petroleum sheens and trash from floating out into the Kill Van Kull

2.0 SITE LOCATION AND BACKGROUND

The Bayonne Industries, Inc. site is a 200-acre, bulk liquid storage facility located on East 22nd Street in Bayonne, Hudson County, New Jersey. The site has a history as a refinery and bulk storage facility going back to the early part of the century. Currently, the facility maintains several hundred tanks containing various grades of petroleum and related products. Figure 2-1 presents a Site Location Map and Figure A-1 in Appendix A presents a Site Map. The Kill Van Kull borders the site on the south, while the Platty Kill Canal and Platty Kill Pond partially border the site on the east.

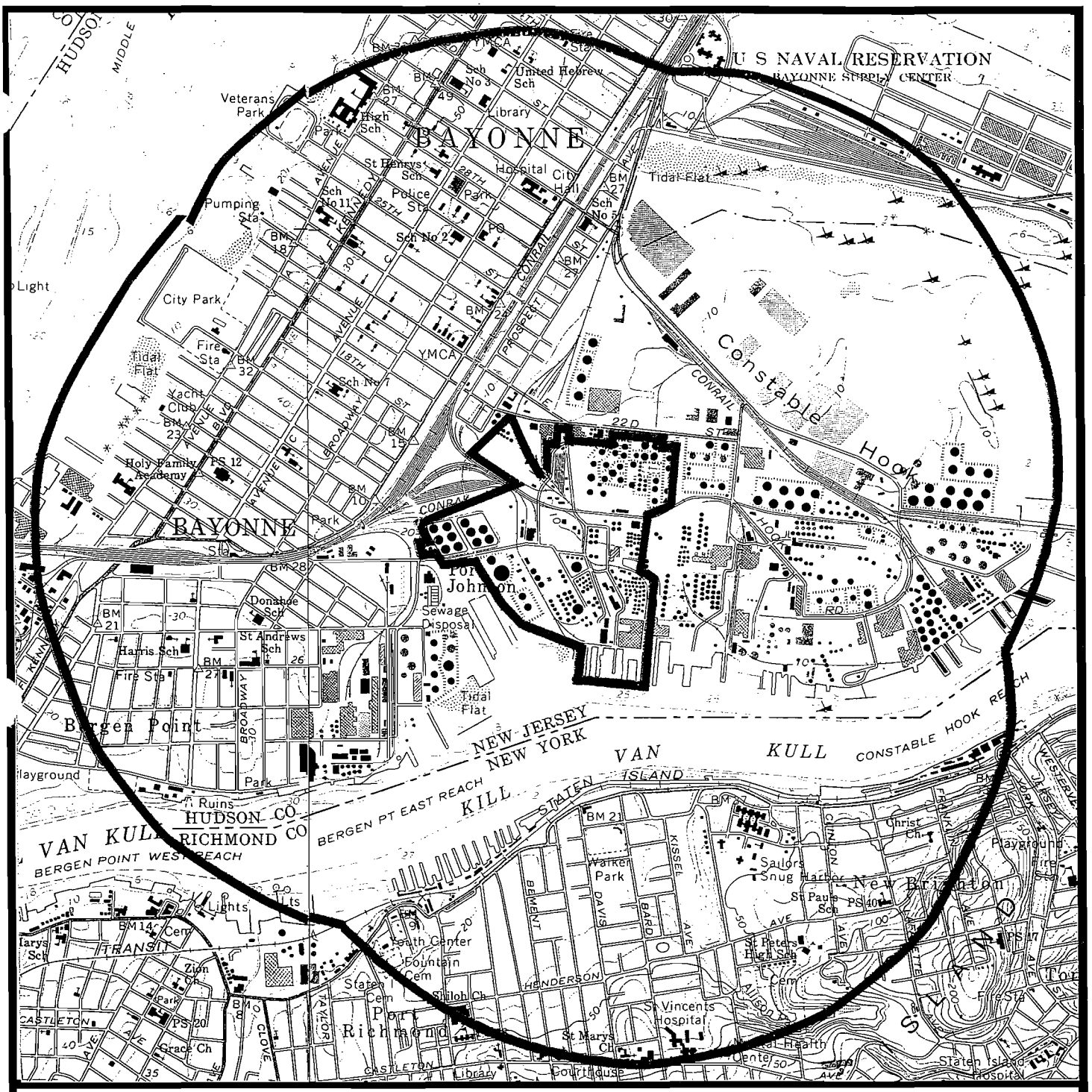
The Platty Kill Pond, which at one time was connected to the dredged Platty Kill Canal, is a former on-site surface impoundment that received the facility's stormwater until May 1978, at which time all site water was directed through an on-site wastewater treatment plant prior to its permitted discharge to open water. The Platty Kill Pond is now separated from the Platty Kill Canal by an earthen dam that has an impermeable barrier installed in its core. The Platty Kill Pond is currently undergoing a bioremediation treatment process that was initiated in 1990 to reduce the petroleum content of residual sludge.

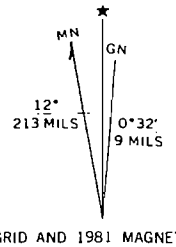
The length of the Platty Kill Canal, from the pond to its confluence with the Kill Van Kull, is approximately 1000 feet. It is now separated from the Kill Van Kull by a sheetpile dam that was installed in 1991 under permit from the U.S. Army Corps of Engineers. The canal has received discharges from the NJDEP-permitted water treatment facility on the Bayonne Industries Site and various outfall pipes which extend from the neighboring Exxon property.

Free-phase product accumulations have been observed in varying amounts in three of the groundwater monitoring wells (MW-5, MW-15 and MW-20) located near the Platty Kill Canal. Free-phase product accumulations in the vicinity of the canal have also been reported on the Exxon Property, which borders the site to the east.

2.1 Site Geology and Hydrogeology

Based on a review of historical soil boring and monitoring well construction logs, the site is known to be underlain by fill material composed of cinders, ash, wood and concrete which ranging in thickness from 3 to 17 feet. Silty clay (commonly referred to as the meadow mat) underlies the fill material and ranges in thickness from 6 to 10 feet. Beneath the silty clay, sand and gravel is reported to occur to the bedrock (approximately 70 feet below grade).





UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

BAYONNE INDUSTRIES, INC.

Site Location Plan / 1-Mile Vicinity Map

Bayonne, Hudson County, NJ

USGS Jersey City, NJ-NY Quadrangle
7.5 Minute Series (Topographic)

Date: 1967, photorev. 1981

QUADRANGLE LOCATION

Figure: 1
Scale: 1"=2000'

Prepared by:
ENSR

All existing monitoring wells at the site are screened above the meadow mat. The depth to groundwater across the site ranges from 1 to 18 feet below grade with an average hydraulic gradient of 0.0029 (based on January 1995 data), generally toward the south-southwest, except in the immediate vicinity of the canal.

3.0 SUMMARY OF FIELD ACTIVITIES

This section summarizes the field activities and presents the procedures and methodologies used during the implementation of the IRA field program. All activities were conducted in accordance with the NJDEP approved Platty Kill Canal IRA Work Plan, dated April 1994. The results for each of these activities are presented in Section 4.0.

3.1 Bulkhead Reconstruction and Curtain Installation

3.1.1 Platty Kill Canal Bulkhead Reconstruction

From July to November, 1994, Eastchester Towing, Inc., New York, reconstructed the Platty Kill Canal bulkhead south of the sheet pile dam separating the canal from the Kill Van Kull. The bulkhead is located in the southwestern corner of the property. Figure B-1 in Appendix B presents the location of the reconstructed bulkhead. The objective of the reconstruction was to replace the failing bulkhead while maintaining structural stability to the roadway adjacent to the Platty Kill Canal, and to provide a barrier to abate potential seepage of free-phase product from along the shoreline into the mouth of the Platty Kill Canal and Kill Van Kull. To further reduce the potential for the migration of free-phase product to the Platty Kill Canal and the Kill Van Kull, and to facilitate free-phase product recovery, a subsurface free-phase product curtain (subsurface retainage wall) was installed perpendicular to the bulkhead. During the excavation along the canal for the bulkhead reconstruction, very little visible hydrocarbon product accumulation were observed.

The new bulkhead consists of a series of 35-foot long interlocking metal sheetpiles that begin at the existing sheetpile dam and extend approximately 237 feet southward along the canal bank toward the Kill Van Kull. Figure B-2, in Appendix B, provides Bulkhead Reconstruction Detail. The sheetpiles were installed at a distance of approximately 2.5 feet outward from the existing bulkhead. The new sheetpile bulkhead is held in place in a configuration using existing tie-rods that have been extended to connect into the new sheetpile wall. The space between the existing bulkhead and the new sheetpile bulkhead was filled with a certified clean, clay-based fill to serve as structural support for the new bulkhead and as a low permeability barrier between the Platty Kill Canal and potential landside free-phase product plume. A copy of the clean fill certificate is provided in Appendix C.

3.1.2 Product Curtain Installation

In October, 1994, Eastchester installed the subsurface retainage wall (product curtain). The location of the product curtain is presented on Figure B-1, in Appendix B. The free-phase product curtain is connected to the south end of the reconstructed bulkhead and consists of a series of 4-foot wide by 8-foot long interlocking metal sheetpiles installed perpendicular to the reconstructed bulkhead. The bottom of each sheetpile was driven to a depth of approximately 10 feet below ground surface, leaving an approximate four to five foot gap between the bottom of the sheetpile and the meadow mat. This design is similar to an oil-water separator baffle which permits free-phase product to become trapped along the curtain for recovery purposes, and allows groundwater to continue to flow towards, and tidal backflow from, the Kill Van Kull. Construction details of the product curtain are provided on Figure B-2, in Appendix B.

3.2 Interim Free-Phase Product Recovery

Interim free-phase product recovery in the general vicinity of the Platty Kill Canal and eastside waterfront was implemented in four steps. Step 1 included free-phase product recovery from three existing ground-water monitoring wells adjacent to the Platty Kill Canal and on the downgradient edge of the free-phase product plume in Yard 2. Step 2 included a limited soil boring and groundwater monitoring well installation program to further define geology in the area and aid in the final design of the free-phase product recovery system. Step 3 included free-phase product sampling and analysis, and bail down tests, to identify the free-phase product type present on the water table, determine potential product recovery rates and estimate the actual thickness of the free-phase product plume. Step 4 included passive free-phase product recovery from recovery wells installed on the upgradient side of the product curtain.

3.2.1 Free-Phase Product Recovery From Existing Monitoring Wells

On March 21, 1994, Petrotrap® passive skimmers were installed in to three existing monitoring wells (MW-5, MW-15, and MW-20) located in the vicinity of the Platty Kill Canal. The location of these wells is presented on Figure B-1, in Appendix B. Historically; monitoring wells MW-5, MW-15 and MW-20 have displayed product accumulations ranging from 0.05 feet (7/13/93; MW-15) to 2.22 feet (7/13/93; MW-5). Passive skimmers have been operated in monitoring wells MW-5 and MW-20 since March 21, 1994 to present. Between March 21 and July 26, 1994, product accumulations in MW-15 were reduced to non-detectable levels. At the end of July 1994 the passive skimmer in MW-15 was transferred to monitoring well Y2-MW-39. Monitoring well Y2-MW-39 was installed in July 1994 and was expected to

accumulate product following installation. The passive skimmer remained in Y2-MW-39 from the end of July 1994 to November 1994; however, free-phase product has not observed in Y2-MW-39 to date. In November 1994, the passive skimmer was transferred from Y2-MW-39 to MW-4. Since May 1993, MW-4, which is located near the Platty Kill Pond, has displayed product accumulations ranging in thickness from 0.27 ft. (6/10/93) to 1.75 ft. (10/15/93).

The Petrotrap® is a skimming unit which consists of an active buoy assembly, a collection canister and an exterior housing. The buoy assembly contains a hydrophobic membrane which allows only product to enter the collection canister and can also reduce product accumulations. These skimmers were used to initiate free-phase product recovery in the southeast corner of the site. All product accumulations removed by the passive skimmers were collected from the wells on a bi-weekly basis (twice/month). The free-phase product was manually removed from the passive skimmers by a technician and transferred to 55-gallon drums to await disposal. The fluids contained in the drums are presently stored on site in an enclosed secondary containment system at MW-5 and MW-20 locations.

During each site visit, an ENSR technician recorded the quantity of product removed from each well, measured and recorded the groundwater and free-phase product elevations in each well, and measured and recorded the amount (i.e., inches) of accumulated product in the product storage drums.

3.2.2 Exploratory Soil Boring and Groundwater Monitoring Well Installation

Three shallow exploratory soil borings were completed in July 1994 to further define the geology in the area and to aid in the development of the final design of the free-phase product recovery system. These borings were installed prior to installation of the product curtain. The borings were advanced to the meadow mat in the area of the proposed product curtain. The NJDEP approved IRA Work Plan had proposed the installation of four exploratory soil borings; however several attempts to install the fourth soil boring met with refusal at less than 1 foot; therefore, installation of this soil boring was abandoned. In addition to the soil borings, three shallow groundwater monitoring wells, Y2-MW-39, Y2-MW-40, and Y2-MW-41, were installed to delineate and monitor free-phase product accumulations in the vicinity of the Platty Kill canal. Monitoring wells Y2-MW-39 and Y2-MW-41 were installed in July 1994. Due to bulkhead reconstruction activities in July 1994 the installation of monitoring well Y2-MW-40 was postponed until December 1994, at the same time as the installation of recovery wells. Liquid measurements collected from these wells will be discussed in Section 4.4. The location of these soil borings and monitoring wells are provided on Figure B-1 in Appendix B.

3.2.2.1 Exploratory Shallow Soil Boring Installation

In July 1994, three exploratory soil borings Y2-PKB-SS-01, Y2-PKB-SS-02, and Y2-PKB-SS-04 were drilled using the hollow-stem auger method in the area of the proposed product curtain. The fourth soil boring was abandoned due to refusal at less than one foot in depth. The drilling was performed by a New Jersey licensed driller employed by SJB Drilling Services, New Holland, Pennsylvania and supervised by an ENSR hydrogeologist. Continuous split-spoon sampling was conducted in each boring, in accordance with the New Jersey Department of Environmental Protection (NJDEP) Field Sampling Procedures Manual (FSPM) and the standard penetration test procedure (ASTM D1586).

Two soil borings Y2-PKB-SS-01 and Y2-PKB-SS-02, were advanced to the meadow mat, between 16 and 18 feet below grade. The third soil boring, Y2-PKB-SS-04 met with refusal at 6 feet below grade. The recovered soils in each split-spoon were initially field-screened with a photoionization detector (PID), characterized, and recorded on a soil boring log. In accordance with the NJDEP, Technical Requirements for Site Remediation (NJAC 7:26E-3.6(a)2ii), the Burmister soil classification system was used to describe the soils encountered during the investigation. Soil boring logs are provided in Appendix D.

Two samples were collected from these soil borings for geotechnical analysis: One was collected from the meadow mat (silty clay) at boring Y2-PKC-SS-01 and the second was collected from the overlying stratigraphic unit at boring Y2-PKC-SS-04. These samples were collected to determine the hydraulic conductivity and the grain size distribution for each stratigraphic unit. The sample of the meadow mat was collected by shelby tube and the sample of the overlying stratigraphic unit was collected by split-spoon. The geotechnical analysis was performed by Paulus, Sokolowski, and Sartor of Warren, New Jersey. Results of the geotechnical analysis are provided in Section 4.0.

At the completion of the soil boring installation, each borehole was tremi-grouted with a bentonite-concrete mixture, from the completion depth to ground surface. All contaminated soils were containerized on site.

3.2.2.2 Shallow Groundwater Monitoring Well Installation

In July and December 1994, three shallow monitoring wells, Y2-MW-39, Y2-MW-40, and Y2-MW-41 were installed to delineate and monitor the free-phase product accumulations in the area of the Platty Kill Canal. These wells were installed by a New Jersey certified driller from SJB Services, New Holland, Pennsylvania.

Soil borings completed for the installation of monitoring wells were advanced to total depths between 13 and 15 feet below grade using the hollow-stem auger method of drilling. The borings were completed as monitoring wells using 4-inch diameter flush-threaded schedule 40 PVC, 20-slot screen and solid casing with Morie grade No.2 sand pack. Approximately one foot of fine to very fine sand was overlain at the top of the sand pack. Overlying the sandpack, a grout mixture of Portland cement and high grade bentonite was tremi-grouted into the annular space to ensure a proper seal. Each well screen was installed to intersect the water table, taking into consideration tidal fluctuations. Monitoring Well Construction diagrams are provided in Appendix D.

Each groundwater monitoring well was developed for approximately one hour until the discharge water became relatively clear (removal of fine-grained materials). Development rates were high enough to remove the fines from the sand pack but low enough to avoid dewatering the well. The development water was containerized on site.

All drilling equipment used for the well installation was decontaminated with a high pressure steam clean wash followed by a potable supply water rinse. All fluids generated from decontamination were containerized and stored on site.

The ground surface and casing elevations of the monitor wells were surveyed by a certified Professional Land Surveyor, J. Peter Borbas, PLS, Boonton, New Jersey.

3.3 Free-Phase Product Recovery at the Curtain

As previously stated, to minimize the potential for free-phase product to enter the Platty Kill Canal and Kill Van Kull through the bulkhead, a product curtain was installed in the southeast portion of the site. Additionally, in December 1994, three shallow recovery wells, Y2-PKB-RW-1, Y2-PKB-RW-2, and Y2-PKB-RW-3 were installed to initiate free-phase product recovery on the upgradient side of the product curtain. The location of these wells are presented on Figure B-1 in Appendix B.

3.3.1 Recovery Well Installation

The recovery wells were drilled to a total depth of 9.5 feet below grade by a New Jersey certified driller, from SJB Services. The wells were installed with 5 feet of 6-inch I.D., flush-threaded, Type 304, wire-wrapped, stainless steel screen, and 4 feet of 6-inch I.D., solid, carbon steel casing, with the bottom of the well screen being capped by a 2-foot section of 6-inch I.D., solid, carbon steel casing to act as a sump. A sand pack for each recovery well was placed around the well screen, extending to approximately two feet above the top of the

screen. Approximately one foot of fine to very fine sand was placed at the top of the sand pack. A grout mixture of Portland cement and high grade bentonite was tremi-grouted into the annular space above the sand pack to ensure a proper seal. Recovery Well Construction diagrams are provided in Appendix D.

Following installation, each recovery well was developed for approximately one hour until the discharge water became relatively clear (removal of fine-grained materials). As with the monitoring wells, development rates were high enough to remove the fines from the sand pack but low enough to avoid dewatering the well. The development water was containerized and stored on site.

All drilling equipment used for the well installation was decontaminated with a high pressure steam clean wash followed by a potable supply water rinse. All fluids generated from decontamination were containerized and stored on site.

The ground surface and casing elevations of the recovery wells were surveyed by a certified Professional Land Surveyor, J. Peter Borbas, PLS, Boonton, New Jersey.

3.3.2 Free-Phase Product Characterization

3.3.2.1 Free-Phase Product Sampling and Analysis

In order to characterize the free-phase product in the area of the Platty Kill Canal, product samples were collected and analyzed for product type (GC fingerprint) and relative age (forensic). Free-phase product samples were collected from monitoring wells MW-5 and MW-20, and recovery wells Y2-PKB-RW-1 and Y2-PKB-RW-2. Samples were collected using disposable, bottom-filling PVC bailers. Prior to sample collection, the depth to product and water were measured in each well utilizing an oil/water interface probe, designed to detect the presence and thickness of light, non-aqueous phase liquids (LNAPL). For each product sample collected a dedicated polyethylene bailer was used to collect the free-phase product and underlying groundwater. The samples were directly transferred from the bailer to the laboratory-supplied sample jars.

Free-phase product samples were shipped to International Lubrication and Fuel Consultants (ILFC), in Rio Rancho, New Mexico, (New Jersey Laboratory Certification No. 71800) for analysis. Samples were analyzed in accordance with ILFC's hydrocarbon finger printing protocols which include modified EPA Methods 8015, 8260 and 8270.

3.3.2.2 Free-Phase Product Bail-Down Test

In order to estimate the volume of recoverable product within the subsurface formation and to determine the potential product recovery rate for the formation, product bail-down tests were performed on recovery wells Y2-PKB-RW-1 and Y2-PKB-RW-2, and monitoring well MW-20 in January 1995. Due to the high viscosity of the product in monitoring well MW-5, a fourth test was aborted. Product bail-down tests are performed to distinguish between the measured apparent product thickness in the well and the actual product thickness within the formation.

As originally described by Gruszczenski (1987)[1], the test procedure includes the removal of all free-phase product from the well with subsequent measurements of the water table interface and product accumulations at specific intervals (i.e., every 30 seconds). Following the completion of the test, the data points of depth-to-product and depth-to-water are graphically plotted against time. The point at which the depth-to-water curve changes from a positive slope to a negative slope is referred to as the inflection point. The negative slope (or increase in the product thickness) after the inflection point is the result of product draining from the capillary fringe. The distance between the inflection point and the measured stabilized top-of-product measurements is the sum of the capillary fringe and the actual formation thickness. For graphical determination of the actual product thickness in the formation, the "inflection point time" can be plotted on a graph depicting product thickness over time.

3.3.3 Passive Skimmer Installation - Recovery Wells

On January 4, 1995, two passive skimmers were transferred from existing monitoring wells MW-4 and MW-5 to recovery wells Y2-PKB-RW-1 and Y2-PKB-RW-2. In February 1995, a fourth skimmer was acquired and installed into monitoring well MW-5. To date, skimmers are being utilized in Y2-PKB-RW-1, Y2-PKB-RW-2, MW-5 and MW-20.

3.4 Platty Kill Canal Sediment Investigation

The sediment investigation of the Platty Kill Canal was conducted in two steps. The first step included a bathymetric survey to determine the elevation of the top of the sediment profile. The second step included the collection and analysis of sediment samples. The primary objective of the sediment investigation was to provide general delineation of any contaminated

[1] Gruszczenski, T.S. 1987. Determination of a Realistic Estimate of the Actual Formation Product Thickness using Monitor Wells: A Field Bailout Test. *In Proceedings of Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection and Restoration. NWWA, Houston, Texas.*

sediment in the Platty Kill Canal and Kill Van Kull, outward of the sheetpile dam, and to determine whether a contaminant concentration gradient exists with depth. For discussion purposes the Platty Kill Canal can be divided into three distinct sections. The northern most section includes the area from the earthen dam at the Platty Kill Pond to the bridge and baffle that span the canal. The mid-section includes the area from the bridge to the sheetpile dam at the mouth of the Platty Kill Canal. The third section includes the area outside of the sheetpile dam. The Platty Kill Canal is presented on Figure E-1 in Appendix E.

3.4.1 Bathymetric Survey

The bathymetric survey was conducted in November 1993. The survey was conducted by collecting a series of electronic soundings in the Platty Kill Canal and in the Kill Van Kull outward of the sheetpile dam. These soundings were used to establish a contour map of the top of the sediment. The top of sediment profile was used to determine actual sample locations. Figure E-1 in Appendix E provides the Bathymetric Survey Map of the Platty Kill Canal.

3.4.2 Sediment Sampling Program

From October 18 to 21, 1994, sixteen, 10-foot sediment cores were collected from the Platty Kill Canal using a portable vibratory corer mounted on a 22-foot, motorized pontoon work platform. Eight sediment cores were collected from outside of the sheetpile dam that separates the Platty Kill Canal and Kill Van Kull, and eight were collected from inside the sheetpile dam. Of the eight sediment cores that were collected from inside the sheetpile dam, four were from the northern section and four were from the mid-section. The time frame in which the sampling was conducted was selected since limited or no precipitation had occurred, so that the sediments sampled were not disturbed by natural surface runoff or dispersed by turbulent flow. Thirty-two samples (two per core) plus quality assurance/quality control (QA/QC) samples were submitted for laboratory analysis. Sediment Core locations are presented on Figure E-1 in Appendix E.

Prior to initiating the sampling activity, all work areas (where practical) were covered with plastic sheeting and all sampling equipment (core tubes, etc.) were steam cleaned. All field personnel handling the sediment cores or the sediment corer were in modified level C protection. A core sampling station was established in a central location onshore. A crane was used to place the floating work platform in the desired area (within the canal, within the Kill Van Kull). Once the work platform was placed in the water, it was mobilized to the selected sampling location and the position was stabilized for coring.

A vibratory corer (OSI Model 1000) fitted with a dedicated aluminum core tube was lowered into the water until the core sampling tube was positioned at the water-sediment interface (canal bed). Once at the interface, the vibratory coring process commenced until a full 10-foot core length of penetration was achieved or refusal was met. Upon completion of the coring, the vibratory corer was removed from the water and the tube ends were capped. The work platform was then mobilized to the shore and the core tube was transferred to field personnel at the onshore sampling station. The core tube was cut lengthwise into two halves using a hand-held electric clipper. The shallow blade of the clipper permitted that only the aluminum core tube was cut, yielding very little disturbance to the sediment core. After the core tube was opened, the sediment core was screened with a photoionization detector, sediment was sampled for analysis, the sediment core was logged and finally the core was photo-documented.

Samples were collected from each sediment core at two depth intervals; the 0- to 5-foot interval; and in 5- to 10-foot interval. The volatile organic fraction from each specified depth interval was collected first, using a stainless steel trowel. The remainder of each sample was transferred to a decontaminated, stainless steel bowl and homogenized, and then transferred to the appropriate sample jar for the remaining analytical fractions. To prevent cross-contamination, the laboratory cleaned sample containers remained sealed until the sample was removed from the core tube and homogenized. Disposable latex gloves were changed by the sample technician for each sample collected. After a sufficient amount of sample was placed in the container, the container was sealed and placed in a cooler at 4°C until final receipt at the laboratory. This procedure was repeated for each sediment core location. The coolers containing the samples and the chain-of-custody documentation were shipped daily from the site to IEA Laboratories in Whippany, New Jersey, laboratory certification no. 14530. Table 3-1 provides a summary of the samples collected and the analytical procedures used.

Environmental duplicate samples were collected at a frequency of one per twenty samples. Field blanks were collected at a frequency of one per day. Each QA/QC sample was analyzed for the same parameters as the sediment samples.

Following sampling of each core, all sampling equipment was decontaminated for reuse in accordance with the procedures specified in the NJDEP FSPM and Bayonne Industries RI work plan. The excess sediment not used during sampling was temporarily placed on plastic sheeting and later disposed of directly back into the Platty Kill Canal.

TABLE 3-1
SUMMARY OF SEDIMENT SAMPLE ANALYSES
PLATTY KILL CANAL
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

SAMPLE ID NUMBER	ANALYTICAL PARAMETERS
Y9-PKC-SED-01A	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-01B	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-02A	TPH, pH, TOC, GSZ
Y9-PKC-SED-02B	TPH, pH, TOC, GSZ
Y9-PKC-SED-03A	TPH, pH, TOC, GSZ
Y9-PKC-SED-03B	TPH, pH, TOC, GSZ
Y9-PKC-SED-04A	TPH, pH, TOC, GSZ
Y9-PKC-SED-04B	TPH, pH, TOC, GSZ
Y9-PKC-SED-05A	TPH, pH, TOC, GSZ
Y9-PKC-SED-05B	TPH, pH, TOC, GSZ
Y9-PKC-SED-06A	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-06B	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-06C (DUP)	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-07A	TPH, pH, TOC, GSZ
Y9-PKC-SED-07B	TPH, pH, TOC, GSZ
Y9-PKC-SED-08A	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-08B	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-09A	TPH, pH, TOC, GSZ
Y9-PKC-SED-09B	TPH, pH, TOC, GSZ
Y9-PKC-SED-10A	TPH, pH, TOC, GSZ
Y9-PKC-SED-10B	TPH, pH, TOC, GSZ
Y9-PKC-SED-11A	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-11B	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-12A	TPH, pH, TOC, GSZ
Y9-PKC-SED-12B	TPH, pH, TOC, GSZ

TABLE 3-1 CONT'D

SAMPLE ID NUMBER	ANALYTICAL PARAMETERS
Y9-PKC-SED-13A	TPH, pH, TOC, GSZ
Y9-PKC-SED-13B	TPH, pH, TOC, GSZ
Y9-PKC-SED-14A	TPH, pH, TOC, GSZ
Y9-PKC-SED-14B	TPH, pH, TOC, GSZ
Y9-PKC-SED-15A	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-15B	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-16A	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-16B	TPH, TCL*, TAL, pH, TOC, GSZ
Y9-PKC-SED-16C (DUP)	TPH, TCL*, TAL, pH, TOC, GSZ

TPH - Total Petroleum Hydrcarbons - NJDEPE Method OQA-QAM-005-12/89
TCL - Target Compound List Organics - EPA Method 3550/8240/8270
TAL - Target Analyte List Inorganics - EPA Method3050/6010/7000
TOC - Total Organic Carbon - EPA Method 9060
GSZ - Grain Size Distribution
* - Semi volatile cleanup, if required - EPA Method 3611 or 3640

Reference No.: PKCIRA.TBL

3.5 Pneumatic Barrier Installation

Between March 27, and April 5, 1995, Air Guard, Inc., of Trumbull, Connecticut installed a pneumatic barrier (The Air Guard Containment System™) at the mouth of the Platty Kill Canal. The pneumatic barrier is attached to the bulkhead at a location approximately mid-point between monitoring well Y2-MW-40 and the product curtain, and extends to, and is attached at, the mid-point of the sheetpile dam at the mouth of the Platty Kill Canal. The purpose of the pneumatic barrier is to contain floating trash and oil seepage from the Platty Kill Canal and from under the bulkhead, from floating out into the Kill Van Kull waterway. A secondary objective of the system is the enhancement of the water quality at the mouth of the Platty Kill Creek Canal, by the addition of substantial pounds of dissolved oxygen into an oxygen deficient environment.

The Air Guard Containment System™ works by creating a surface and underlying current of a magnitude sufficient to prevent floating liquids and solids from overrunning it or being entrained below it. The current is induced by means of air (which is supplied by an onshore compressor) flowing through a perforated pipe that is laid on the bed of the harbor or canal. The perforations along the length of the manifold pipe allows the air to escape through the water column, and creates a vertical wall of bubbles. The drag of the bubbles and lowered pressure within the bubble stream creates an upward current which, when approaching the surface, turns into a horizontal flow. The generated surface current opposes (acts as a barrier to) existing water movement thereby preventing the passage oil or any other surface debris.

Permits for the installation of the pneumatic barrier were applied for and received from the New York District of the U.S. Army Corps of Engineers (NYDCOE Permit No. 94-06220, dated December 29, 1994) and the NJDEP (Waterfront Development permit No. 0901-94-00041, dated October 4, 1994).

3.5.1 Effect on Water Quality

An environmental assessment was conducted by Environmental Services of Easton, Connecticut, to determine the localized effect the pneumatic barrier was having on water quality and endemic fish populations in the vicinity of the Platty Kill Canal mouth. The sampling design was developed to address chemical, physical, and biological parameters in the near field of the pneumatic barrier and neighboring control sites. One test site and three control sites were selected. The control sites were selected based on similarity to the test site relative to:

- presence of structure, open water vs. protected waters;

- water velocity and currents;
- salinity regime;
- water depth;
- sediment characteristics;
- temperature and dissolved oxygen; and
- food resources.

The test site encompassed the inter-pier basin between IMTT Pier #4 and Exxon Pier #1, with sampling conducted as close to the pneumatic barrier as possible. The control sites included the inter-pier basin located between IMTT Piers #3 and #4, approximately 500 to 700 feet from the pneumatic barrier; the inter-pier basin between IMTT Pier #2 and the Coal Pier, approximately 1,000 to 1,200 feet from the pneumatic barrier; and a site directly across the Kill Van Kull from the Bayonne Industries site, approximately 1,500 to 2,000 feet from the pneumatic barrier.

Fish and pelagic macroinvertebrates were collected at each of the sites using a variety of sample collection equipment including gill nets, bottom/surface/midwater trawls, and trap nets. Water quality data including turbidity, temperature, dissolved oxygen, and percent saturation were also collected in conjunction with each biological sample collected.

4.0 FINDINGS/INTERIM REMEDIAL ACTION

This section summarizes the results and presents a discussion of the findings for the IRA activities.

4.1 Platty Kill Canal Bulkhead Reconstruction

The reconstruction of the bulkhead required 5 months to complete. Since the reconstruction of the bulkhead on the Platty Kill Canal, free-phase product seepage from the canal has been attenuated.

4.2 Platty Kill Canal Product Curtain

Following the installation of the product curtain three recovery wells were installed on the hydraulically upgradient side of the curtain. Within weeks of their installation, two of the three recovery wells began to accumulate free-phase product. Free-phase product accumulations which increase in thickness over time at these well locations will be indicative of the free-phase product plume attenuation.

4.3 Geological Characterization in the Vicinity of the Platty Kill Canal

During installation of the exploratory soil borings, monitoring wells and recovery wells, split-spoon samples and samples for geotechnical analyses were collected to characterize and understand the geology in the vicinity of the Platty Kill Canal. The results of these samples are provided below.

4.3.1 Shallow Exploratory Soil Borings

On July 20, 1994, three shallow exploratory soil borings (Y2-PKB-SS-01, Y2-PKB-SS-02, Y2-PKB-SS-04) were completed along the Platty Kill Canal. The soil boring locations are presented on Figure B-1 in Appendix B. A fourth soil boring (Y2-PKB-SS-03) was attempted; however, refusal was met at the ground surface. Continuous split-spoon sampling was conducted at each soil boring. The soil boring logs are provided in Appendix D. In reference to Appendix D, the soils observed while drilling primarily consisted of red-brown to black fill material (concrete, wood, brick, coal, rock fragments, medium to fine sand and silt) from the ground surface to between 4 and 8 feet below grade level. From 8 to 12 feet below grade, black clayey silt to clayey sand with trace amounts of fill material (wood, brick, concrete) was observed. Black to brown clayey silt with varying amounts of medium to fine sand, gravel

and shell fragments were observed between 12 and 16 feet. Below 16 feet, dark gray clay with some silt and trace amounts of shell fragments were observed. Volatile organic vapors were primarily detected at the water table interface (~5 feet below grade). The highest volatile organic vapor levels (100 parts per million) were observed in soil boring Y2-PKB-SS-01 between 6 and 10 feet below grade.

Two samples for geotechnical analyses were collected, one from soil boring Y2-PKB-SS-01 and one from soil boring Y2-PKB-SS-04, at depths of 18 to 20 feet and 4 to 6 feet, respectively. These samples were submitted for geotechnical analysis at Paulus, Sokolowski and Sartor of Warren, New Jersey. Appendix F contains the data for these analyses. The geotechnical sample collected from soil boring Y2-PKB-SS-01 was collected using a shelby tube, and is assumed to be representative of the meadow mat. The geotechnical analysis of soil sample Y2-PKB-SS-01 indicated that it was a dark gray, organic silty clay with occasional shell fragments and had a hydraulic conductivity of 1.14×10^{-7} cm/sec (3.73×10^{-9} ft/sec). This hydraulic conductivity value is typical of marine clays.

The geotechnical sample collected from soil boring Y2-PKB-SS-04 was collected using a split-spoon sampler, and is assumed to be representative of the fill material. The grain size distribution analysis of soil sample Y2-PKB-SS-04 indicated that it was a tan-brown to dark gray fine to medium sand with little silt and trace amounts of fine gravel and coarse sand. Though not analyzed, the hydraulic conductivity for silty to fine sand typically ranges from 1×10^{-5} to 1×10^{-3} cm/sec.

4.3.2 Shallow Groundwater Monitoring Wells

There were five existing monitoring wells located in the vicinity of the Platty Kill Canal prior to implementation of this IRA. These included MW-4, MW-5, MW-15, MW-19, and MW-20. In July and December 1994, three additional monitoring wells, Y2-MW-39, Y2-MW-40, and Y2-MW-41, were installed to delineate and monitor the free-phase product accumulations in the area of the Platty Kill Canal. The location of the wells in the vicinity of the Platty Kill Canal are presented on Figure B-2 in Appendix B. Well construction diagrams, well permits, well certification Forms A and B, and well records for the newly installed wells are contained in Appendix D.

Four samples for geotechnical analyses were collected from soil borings Y2-MW-39 and Y2-MW-41 at stratigraphic depths which correlate to the fill material (5 to 9 feet) and the meadow mat (13 to 15 feet). These samples were submitted for geotechnical analysis at Paulus, Sokolowski and Sartor of Warren, New Jersey. Appendix F contains the data for these analyses. The shelby tube samples collected from soil borings Y2-SS-MW-39 and Y2-

SS-Y2-MW-41 indicated that they were similar in composition: dark gray, organic silty clay to clayey silt with occasional shell fragments. The hydraulic conductivities for soil collected from Y2-SS-MW-39 and Y2-SS-Y2-MW-41 were determined to be 4.24×10^{-8} cm/sec and 2.56×10^{-8} cm/sec, respectively. As with soil sample Y2-PKB-SS-01, these hydraulic conductivity values are typical of marine clays. The grain size distribution analysis of Y2-SS-MW-39 identified it as dark brown to black, coarse to fine sand with some coarse to fine gravel, little silt and trace amounts of cinders and brick fragments. The grain size distribution analysis of Y2-SS-Y2-MW-41 identified it as dark gray to black, coarse to fine sand with some silt and trace amounts of fine gravel, cinders, concrete and brick fragments.

4.3.3 Product Recovery Wells

In December 1994, following installation of the product curtain, three 6-inch diameter product recovery wells (Y2-PKB-RW-1, Y2-PKB-RW-2, and Y2-PKB-RW-3) were installed on the upgradient (north) side of the product curtain to initiate free-phase product recovery. The location of the product curtain and the recovery wells are provided on Figure B-1 in Appendix B. Well construction diagrams, well permits, well certification Forms A and B, and well records are contained in Appendix D.

The soil observed while drilling at Y2-PKB-RW-01 consisted of black clay from the surface to 2 feet of depth. Underlying the black clay unit, black fine to coarse sand and gravel with varying amounts of clay was observed to a depth of 12 feet, the well completion depth. This contrasts with information obtained for recovery wells Y2-PKB-RW-02 and Y2-PKB-RW-03. The soil observed while drilling recovery well Y2-PKB-RW-02 consisted of brown, coarse to fine sand and gravel from the surface to three feet below grade. Below three feet, brown to black clay with minor varying amounts of sand, silt and gravel was observed to 8 feet. Below 8 feet, clayey sand and gravel were observed to 12 feet below grade. The soils observed while drilling recovery well Y2-PKB-RW-03 consisted of brown-black medium sand with little gravel and trace amounts of clay from the surface to two feet below grade. Below two feet, concrete and slag in a brown clay and silt matrix was observed to 4 feet of depth. Below 4 feet, black clay with minor amounts of coarse sand was observed to 12 feet below grade. The stratigraphic variance between these closely spaced borings is indicative of the nature of the fill material in this area. The recovery well soil boring logs are provided in Appendix D.

4.3.4 Stratigraphic Characterization in the Vicinity of the Platty Kill Canal

The soil observed in the vicinity of the Platty Kill Canal consists primarily of thin deposits of fill material and gravelly sand-silt mixtures. Figure G-1 in Appendix G provides a stratigraphic cross-section of the geology in the vicinity of the Platty Kill Canal. Recent and historical soil

boring logs were used to generate the stratigraphic cross sections contained on Figure G-1. Cross Section A-A' and B-B' identifies the stratigraphic units from north to south along the Platty Kill Canal. Cross Sections C-C' identifies these stratigraphic units in a perpendicular orientation.

In reference to cross sections A-A' and B-B', the overlying fill material ranges from 5 to 10 feet in thickness. The primary grain size of stratigraphic units which overlie the meadow mat becomes finer towards the south, near the Kill Van Kull, and immediately along the Platty Kill Canal. In the vicinity of the Platty Kill Canal the meadow mat is essentially a silty clay with an occasional presence of fine sand and shell fragments. Along the Platty Kill Canal the meadow mat occurs at approximately 13 feet below grade and is relatively flat. However, further inland, as evidenced by Cross-Section A-A', the meadow mat displays a slight gradient (0.002) from north to south.

4.4 Delineation of Free-phase Product in the Vicinity of the Platty Kill Canal

To delineate the extent of free-phase product in the vicinity of the Platty Kill Canal, ENSR installed a series of monitoring and recovery wells, collected a series of free-phase product measurements from the wells, collected and analyzed free-phase product samples, and conducted free-phase product bail-down tests on select wells. The results of these delineation activities are presented below.

4.4.1 Free-Phase Product Measurements - Monitoring Wells

As part of a year long, site-wide ground water measurement program beginning in February 1993 and ending in February 1994, liquid measurements were collected from existing monitoring wells MW-4, MW-5, MW-15, MW-19, and MW-20. Additional rounds of site-wide liquid measurements were collected in January and June 1995. Monitoring wells MW-4, MW-5, MW-15, and MW-20 have all had a passive skimmer installed in them at some point between March 1994 and January 1995. Liquid measurements were also collected from these wells each time the respective skimmer was emptied. Monitoring wells MW-4, MW-5 and MW-20 have had measurable amounts of free-phase product. Free-phase product has not been measured in monitoring well MW-19. Historically, less than 0.10 foot of free-phase product has been measured in monitoring well MW-15, and no free-phase product has been measured in the well after installation and subsequent removal of the passive skimmer. Liquid measurements collected from newly installed monitoring wells Y2-MW-39, Y2-MW-40, and Y2-MW-41 in July, August, November and December 1994, and January 1995 indicate the absence of free-phase product in these wells. Results of the free-phase product measurements are presented in Tables 4-1 and 4-2. Based on the results of free-phase

TABLE 4-1
FREE PHASE PRODUCT THICKNESS MEASUREMENTS

BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

WELL ID	2/4/93	3/8/93	4/8/93	5/5/93	6/10/93	7/13/93	8/10/93	9/9/93	10/15/93	2/22/94	1/4/95	6/8/95
MW-1	0.89	1.45	1.18	1.42	1.21	2.78	2.44	2.12	2.03	1.96	0.75	2.07
MW-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	sheen
MW-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	sheen
MW-4	0.04	0.31	0.28	0.30	0.27	0.82	1.08	1.47	1.75	1.46	1.55	0.79
MW-5	0.87	0.77	1.31	1.00	0.84	2.22	1.62	1.55	0.92	1.09	0.02	0.15
MW-6	ND	ND	ND	ND	ND	ND	ND	ND	sheen	ND	ND	ND
MW-7	0.09	0.01	0.19	0.23	0.13	0.07	0.06	0.01	0.02	0.03	0.23	0.57
MW-8R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9	ND	ND	ND	ND	ND	ND	ND	ND	sheen	ND	0.27	0.47
MW-10	0.24	0.09	0.43	0.39	0.69	0.03	0.09	0.10	1.13	ND	0.04	0.04
MW-11	0.24	0.19	0.46	0.60	0.38	0.54	0.55	0.63	1.17	1.23	2.62	2.02
MW-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.01
MW-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15	0.03	0.08	NA	0.01	0.08	0.05	0.08	0.06	0.14	ND	ND	sheen
MW-16	0.67	0.49	0.99	0.93	NA	NA	0.44	0.60	0.25	ND	0.08	0.03
MW-17	0.07	0.06	0.02	0.17	0.07	0.11	0.14	0.05	0.08	0.03	0.02	0.39
MW-18R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	sheen
MW-19	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	sheen	ND
MW-20	1.47	1.20	1.01	1.47	1.79	1.69	1.63	1.61	0.57	NA	0.60	0.01
MW-21	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	0.02	sheen
MW-22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01
MW-23	0.02	0.04	NA	0.01	0.03	0.02	0.07	0.05	0.07	0.05	0.26	0.02
MW-24	ND	ND	ND	ND	ND	ND	ND	ND	sheen	ND	NA	0.29
MW-25	ND	ND	ND	ND	ND	ND	ND	ND	ND	sheen	ND	0.01

TABLE 4-1
FREE PHASE PRODUCT THICKNESS MEASUREMENTS

BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

WELL ID	2/4/93	3/8/93	4/8/93	5/5/93	6/10/93	7/13/93	8/10/93	9/9/93	10/15/93	2/22/94	1/4/95	6/8/95
MW-26R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02
MW-27	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	0.08	0.12
MW-28	0.05	0.01	sheen	sheen	ND	ND	ND	ND	ND	ND	0.05	0.03
MW-29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	sheen
Y4-MW-30***	--	--	--	--	--	--	--	--	--	--	--	ND
Y4-MW-31***	--	--	--	--	--	--	--	--	--	--	--	sheen
Y4-MW-32***	--	--	--	--	--	--	--	--	--	--	--	sheen
Y1-MW-33***	--	--	--	--	--	--	--	--	--	--	--	sheen
Y6-MW-34***	--	--	--	--	--	--	--	--	--	--	--	ND
Y5-MW-35***	--	--	--	--	--	--	--	--	--	--	--	sheen
Y1-MW-36***	--	--	--	--	--	--	--	--	--	--	--	0.16
Y3-MW-37***	--	--	--	--	--	--	--	--	--	--	--	sheen
Y9-MW-38***	--	--	--	--	--	--	--	--	--	--	--	0.38
Y2-MW-39 *	--	--	--	--	--	--	--	--	--	--	ND	sheen
Y2-MW-40 *	--	--	--	--	--	--	--	--	--	--	ND	ND
Y2-MW-41 *	--	--	--	--	--	--	--	--	--	--	ND	sheen
Y2-PKB-RW-1**	--	--	--	--	--	--	--	--	--	--	1.45	2.01
Y2-PKB-RW-2 **	--	--	--	--	--	--	--	--	--	--	0.62	2.26
Y2- PKB-RW-3 **	--	--	--	--	--	--	--	--	--	--	--	sheen

Notes:	* = indicates well was installed in 7/94
	** = indicates well was installed in 12/94
	*** = indicates well was installed between 4/95 and 5/95.
	-- = the well was not installed at that time
	ND = not detected (<0.01 ft)
	NA = no access
	sheen = detected but below detection limit (<0.01 ft)

TAb__ 4-2

MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-4								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
11/8/94	11.39	6.16	7.44	1.28	5.23	3.95	5.06	0.13	
11/28/94	11.39	5.51	6.68	1.17	5.88	4.71	5.73	0.25	
12/22/94	11.39	5.48	6.11	0.63	5.91	5.28	5.83	0.09	
1/4/95	11.39	5.22	6.77	1.55	6.17	4.62	5.97	0.00	
1/17/95	11.39	N/A	N/A	N/A	N/A	N/A	N/A	0.63	Skimmer Removed
Total Product Removed (gal):								1.10	gal
Note:	Product Displacement = Product Thickness x Product Specific Gravity (0.87) Corrected Depth to Water = Observed Depth to Water - Product Displacement Corrected G.W. Elevation = Casing Elevation - Corrected Depth to Water								

TABLE 4-2 (Continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-5								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
3/21/94	12.09	10.36	10.56	0.2	1.73	1.53	1.70	0.00	
3/22/94	12.09	10.67	10.69	0.02	1.42	1.4	1.42	0.02	
3/23/94	12.09	-	10.69	0	1.40	1.4	1.40	0.00	
3/25/94	12.09	11.25	11.27	0.02	0.84	0.82	0.84	0.02	
4/4/94	12.09	10.86	10.89	0.03	1.23	1.2	1.23	0.04	
4/8/94	12.09	11.75	11.78	0.03	0.34	0.31	0.34	0.02	
4/22/94	12.09	13.81	14.26	0.45	-1.72	-2.17	-1.78	0.00	
5/2/94	12.09	10.64	10.78	0.14	1.45	1.31	1.43	0.11	possibly water
5/20/94	12.09	8.92	8.98	0.06	3.17	3.11	3.16	0.13	0.19 gal water
6/16/94	12.09	13.93	14.04	0.11	-1.84	-1.95	-1.85	0.09	0.38 gal water
7/1/94	12.09	10.33	10.36	0.03	1.76	1.73	1.76	0.13	0.28 gal water
7/26/94	12.09	8.80	8.90	0.1	3.29	3.19	3.28	0.15	0.35 gal water
8/8/94	12.09	10.22	10.35	0.13	1.87	1.74	1.85	0.11	0.38 gal water
8/30/94	12.09	10.40	10.45	0.05	1.69	1.64	1.68	0.06	0.46 gal water
9/22/94	12.09	10.45	10.51	0.06	1.64	1.58	1.63	0.06	0.44 gal water
10/14/94	12.09	10.97	11.13	0.16	1.12	0.96	1.10	0.09	0.35 gal water
11/8/94	12.09	9.65	10.13	0.48	2.44	1.96	2.38	0.08	0.23 gal water
11/28/94	12.09	10.23	11.36	1.13	1.86	0.73	1.71	0.00	Skimmer problems
12/22/94	12.09	9.26	9.31	0.05	2.83	2.78	2.82	0.15	
1/4/95	12.09	8.49	8.51	0.02	3.60	3.58	3.60	0.00	
1/17/95	12.09	n/a	n/a	n/a	n/a	n/a	n/a	0.06	No Levels Taken
1/27/95	12.09	12.36	12.57	0.21	-0.27	-0.48	-0.30	0.50	
1/30/95	12.09	n/a	n/a	n/a	n/a	n/a	n/a	0.01	No Levels Taken
2/1/95	12.09	-	7.43	0	4.66	4.66	4.66	0.13	
2/2/95	12.09	-	9.95	0	2.14	2.14	2.14	0.00	
2/3/95	12.09	-	11.86	0	0.23	0.23	0.23	0.00	
2/10/95	12.09	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
3/31/95	12.09	11.68	11.69	0.01	0.41	0.4	0.41	0.01	
4/19/95	12.09	8.50	8.51	0.01	3.59	3.58	3.59	0.00	
5/12/95	12.09	11.85	11.86	0.01	0.24	0.23	0.24	0.00	
5/23/95	12.09	12.05	12.05	0	0.04	0.04	0.04	0.00	
5/30/95	12.09	11.67	11.67	0	0.42	0.42	0.42	0.00	
6/6/95	12.09	9.61	9.61	0	2.48	2.48	2.48	0.00	

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-5								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
6/12/95	12.09	11.92	11.92	0	0.17	0.17	0.17	0.00	
7/21/95	12.09	11.89	11.89	0	0.20	0.2	0.20	0.00	
7/28/95	12.09	9.09	9.09	0	3.00	3	3.00	0.00	
7/31/95	12.09	12.81	12.81	0	-0.72	-0.72	-0.72	0.00	
8/4/95	12.09	sheen	12.32	<0.01	n/a	-0.23	-0.22	drops	
8/8/95	12.09	13.08	13.09	0.01	-0.99	-1	-0.99	0.00	
8/11/95	12.09	9.37	9.37	<0.01	2.72	2.72	2.73	0.00	
8/15/95	12.09	9.46	9.48	0.02	2.63	2.61	2.63		
8/21/95	12.09	12.41	12.42	0.01	-0.32	-0.33	-0.32		
8/25/95	12.09	13.53	13.53	<0.01	-1.44	-1.44	-1.43		
8/29/95	12.09	7.91	7.91	<0.01	4.18	4.18	4.19		
9/6/95	12.09	10.99	10.99	<0.01	1.10	1.1	1.11		
9/12/95	12.09	10.75	10.75	<0.01	1.34	1.34	1.35		
9/15/95	12.09	9.31	9.31	<0.01	2.78	2.78	2.79		
9/19/95	12.09	12.33	12.34	0.01	-0.24	-0.25	-0.24		
9/22/95	12.09	11.67	11.67	<0.01	0.42	0.42	0.43		
9/25/95	12.09	8.88	8.88	<0.01	3.21	3.21	3.22		
10/3/95	12.09	12.75	12.78	0.03	-0.66	-0.69	-0.66		
10/6/95	12.09	10.80	10.81	0.01	1.29	1.28	1.29		
10/11/95	12.09	8.48	8.48	<0.01	3.61	3.61	3.62		
10/18/95	12.09	12.81	12.87	0.06	-0.72	-0.78	-0.73		
11/1/95	12.09	12.17	12.17	<0.01	-0.08	-0.08	-0.08	0.03	
11/7/95	12.09	10.98	10.99	0.01	1.11	1.1	1.11	0.05	
	12.09			0	12.09	12.09	12.09		
	12.09			0	12.09	12.09	12.09		
	12.09			0	12.09	12.09	12.09		
	12.09			0	12.09	12.09	12.09		
Total Product Removed (gal):								1.97	gal

Note:
Product Displacement = Product Thickness x Product Specific Gravity (0.87)
Corrected Depth to Water = Observed Depth to Water - Product Displacement
Corrected G.W. Elevation = Casing Elevation - Corrected Depth to Water

TABLE 4-2 (Continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-15								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
3/21/94	11.51	-	9.03	0	-	2.48	2.48	0.00	
3/22/94	11.51	-	9.13	0	-	2.38	2.38	0.00	
3/23/94	11.51	-	9.16	0	-	2.35	2.35	0.00	
3/25/94	11.51	-	9.07	0	-	2.44	2.44	0.00	
4/4/94	11.51	-	9.10	0	-	2.41	2.41	0.00	
4/8/94	11.51	-	8.97	0	-	2.54	2.54	0.00	
4/22/94	11.51	-	9.75	0	-	1.76	1.76	0.00	
5/2/94	11.51	-	9.76	0	-	1.75	1.75	0.00	
5/20/94	11.51	-	8.90	0	-	2.61	2.61	0.00	
6/16/94	11.51	-	8.93	0	-	2.58	2.58	0.00	
7/1/94	11.51	-	9.08	0	-	2.43	2.43	0.00	
7/26/94	11.51	-	10.17	0	-	1.34	1.34	0.00	
8/8/94	11.51	-	no	data	collected	-	-	-	
8/30/94	11.51	-	no	data	collected	-	-	-	
9/22/94	11.51	-	no	data	collected	-	-	-	
10/14/94	11.51	-	no	data	collected	-	-	-	
11/8/94	11.51	-	no	data	collected	-	-	-	
11/28/94	11.51	-	10.17	0	1.34	1.34	1.34	0.00	Skimmer Removed
1/4/95	11.51	9.90	9.19	0.01	1.61	2.32	2.33	0.00	
4/19/95	11.51	-	9.90	0	1.61	1.61	1.61	0.00	
5/2/95	11.51	8.91	8.73	0	2.60	2.78	2.78	0.00	
5/12/95	11.51	9.22	8.91	0	2.29	2.6	2.60	0.00	
5/23/95	11.51	9.72	9.22	0	1.79	2.29	2.29	0.00	
5/30/95	11.51	9.91	9.72	0	1.60	1.79	1.79	0.00	
6/6/95	11.51	-	9.91	0	1.60	1.6	1.60	0.00	
6/12/95	11.51	-	10.24	0	1.27	1.27	1.27	0.00	
7/21/95	11.51	8.87	9.21	0	2.64	2.3	2.30	0.00	
7/28/95	11.51	9.55	8.87	0	1.96	2.64	2.64	0.00	
7/31/95	11.51	9.56	9.55	<0.01	1.95	1.96	1.97	0.00	
8/4/95	11.51	-	9.56	0	1.95	1.95	1.95	0.00	
8/8/95	11.51	8.87	10.03	<0.01	2.64	1.48	1.49	0.00	
8/11/95	11.51	-	8.87	0	2.64	2.64	2.64	0.00	
8/15/95	11.51	8.55	8.39	<0.01	2.96	3.12	3.13	0.00	

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-15								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
8/21/95	11.51	-	8.55	0	2.96	2.96	2.96	0.00	
8/25/95	11.51	-	9.32	0	2.19	2.19	2.19	0.00	
8/29/95	11.51	-	10.15	0	1.36	1.36	1.36	0.00	
9/6/95	11.51	-	8.55	0	2.96	2.96	2.96	0.00	
9/12/95	11.51	-	9.92	0	1.59	1.59	1.59	0.00	
9/15/95	11.51	-	8.76	0	2.75	2.75	2.75	0.00	
9/19/95	11.51	-	10.15	0	1.36	1.36	1.36	0.00	
9/22/95	11.51	-	9.54	0	1.97	1.97	1.97	0.00	
9/25/95	11.51	-	10.82	0	0.69	0.69	0.69	0.00	
10/3/95	11.51	8.24	8.24	<0.01	3.27	3.27	3.28	0.00	
10/6/95	11.51	9.31	9.32	0.01	2.20	2.19	2.20	0.00	
10/11/95	11.51	8.44	8.45	0.01	3.07	3.06	3.07	0.00	
10/18/95	11.51	8.34	8.35	0.01	3.17	3.16	3.17	0.00	
11/1/95	11.51	9.44	9.44	<0.01	2.07	2.07	2.07	0.00	
11/7/95	11.51	8.54	8.55	0.01	2.97	2.96	2.97	0.00	
	11.51				11.51	11.51	11.51		
Total Product Removed (gal):								0.00	gal

Note:
Product Displacement = Product Thickness x Product Specific Gravity (0.87)
Corrected Depth to Water = Observed Depth to Water - Product Displacement
Corrected G.W. Elevation = Casing Elevation - Corrected Depth to Water

TABLE 4-2 (Continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-20								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
3/21/94	8.38	6.41	6.42	0.01	1.97	1.96	1.97	0.11	
3/22/94	8.38	6.07	6.08	0.01	2.31	2.3	2.31	0.08	
3/23/94	8.38	6.24	6.27	0.03	2.14	2.11	2.14	0.06	
3/25/94	8.38	6.17	6.19	0.02	2.21	2.19	2.21	0.09	
4/4/94	8.38	6.14	6.17	0.03	2.24	2.21	2.24	0.22	
4/8/94	8.38	6.53	6.54	0.01	1.85	1.84	1.85	0.13	
4/22/94	8.38	6.38	7.48	1.1	2.00	0.9	1.86	0.14	
5/2/94	8.38	6.35	7.71	1.36	2.03	0.67	1.85	0.13	
5/20/94	8.38	6.03	6.97	0.94	2.35	1.41	2.23	0.13	
6/16/94	8.38	6.47	8.27	1.8	1.91	0.11	1.68	0.41	0.09 gal water
7/1/94	8.38	6.31	7.75	1.44	2.07	0.63	1.88	0.10	
7/26/94	8.38	5.90	7.00	1.1	2.48	1.38	2.34	0.13	
8/8/94	8.38	5.94	6.77	0.83	2.44	1.61	2.33	0.22	
8/30/94	8.38	6.07	6.83	0.76	2.31	1.55	2.21	0.36	
9/22/94	8.38	6.04	7.12	1.08	2.34	1.26	2.20	0.09	
10/14/94	8.38	6.13	7.17	1.04	2.25	1.21	2.11	0.12	
11/8/94	8.38	6.34	7.58	1.24	2.04	0.8	1.88	0.00	Skimmer problems
11/28/94	8.38	6.19	7.03	0.84	2.19	1.35	2.08	0.25	
12/22/94	8.38	5.81	6.35	0.54	2.57	2.03	2.50	0.35	
1/4/95	8.38	5.85	6.45	0.6	2.53	1.93	2.45	0.00	
1/17/95	8.38	n/a	n/a	n/a	n/a	n/a	n/a	0.63	No Levels/Skimmer Out
2/1/95	8.38	4.49	5.59	3.89	3.89	2.79	6.17	0.00	Soakease put in.
2/2/95	8.38	5.69	5.70	2.69	2.69	2.68	5.02	0.00	
2/3/95	8.38	5.07	5.70	0.63	3.31	2.68	3.23	0.10	
2/10/95	8.38	-	-	-	-	-	-	0.00	no levels taken
2/16/95	8.38	6.21	6.47	0.26	2.17	1.91	2.14	0.00	
3/3/95	8.38	5.72	5.98	0.26	2.66	2.4	2.63	0.00	
3/9/95	8.38	5.91	6.05	0.14	2.47	2.33	2.45	0.02	1.5 oz
3/17/95	8.38	5.55	5.69	0.14	2.83	2.69	2.81	0.00	

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-20								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
3/27/95	8.38	5.97	6.00	0.03	2.41	2.38	2.41	0.00	
4/4/95	8.38	5.44	5.52	0.08	2.94	2.86	2.93	0.00	
4/11/95	8.38	6.24	6.27	0.03	2.14	2.11	2.14	0.00	
4/19/95	8.38	5.50	5.50	0	2.88	2.88	2.88	0.00	
5/2/95	8.38	5.15	5.17	0.02	3.23	3.21	3.23	0.00	
5/12/95	8.38	5.21	5.22	0.01	3.17	3.16	3.17	0.00	
5/23/95	8.38	5.62	5.62	0	2.76	2.76	2.76	0.00	
5/30/95	8.38	5.46	5.46	0	2.92	2.92	2.92	0.00	0.25 gal. water
6/6/95	8.38	5.53	5.53	0	2.85	2.85	2.85	0.00	0.5 gal. water
6/12/95	8.38	5.22	5.22	0	3.16	3.16	3.16	0.00	0.5 gal. water
6/15/95	8.38	-	no	data	collected	-	-	0.00	0.5 gal. water
7/21/95	8.38	6.14	6.40	0.26	2.24	1.98	2.21	0.50	
7/28/95	8.38	6.54	7.77	1.23	1.84	0.61	1.68	0.20	0.3 gal. water
7/31/95	8.38	6.35	7.27	0.92	2.03	1.11	1.91	0.30	
8/4/95	8.38	6.33	7.59	1.26	2.05	0.79	1.89	0.25	
8/8/95	8.38	6.13	7.14	1.01	2.25	1.24	2.12	0.25	
8/11/95	8.38	6.01	6.68	0.67	2.37	1.7	2.28	0.20	
8/15/95	8.38	6.23	6.67	0.44	2.15	1.71	2.09	0.50	
8/21/95	8.38	5.93	6.14	0.21	2.45	2.24	2.42	0.20	
8/25/95	8.38	6.50	6.85	0.35	1.88	1.53	1.83	0.08	
8/29/95	8.38	6.28	6.72	0.44	2.10	1.66	2.04	0.00	
9/6/95	8.38	5.31	5.59	0.28	3.07	2.79	3.03	0.08	
9/12/95	8.38	6.20	6.62	0.42	2.18	1.76	2.13	0.06	
9/15/95	8.38	6.64	7.44	0.8	1.74	0.94	1.64	0.20	
9/19/95	8.38	6.57	7.02	0.45	1.81	1.36	1.75	0.05	
9/22/95	8.38	6.20	6.64	0.44	2.18	1.74	2.12	0.08	
9/25/95	8.38	6.26	6.62	0.36	2.12	1.76	2.07	0.09	
10/3/95	8.38	6.14	6.55	0.41	2.24	1.83	2.19	0.02	
10/6/95	8.38	5.88	6.24	0.36	2.50	2.14	2.45	0.04	
10/11/95	8.38	6.15	6.56	0.41	2.23	1.82	2.18	0.02	

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-20								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
10/18/95	8.38	6.74	7.63	0.89	1.64	0.75	1.52	0.02	
11/1/95	8.38	6.66	7.00	0.34	1.72	1.38	1.68	0.02	
11/7/95	8.38	6.18	6.56	0.38	2.20	1.82	2.15	0.02	
	8.38								
	8.38								
	8.38								
Total Product Removed (gal):								7.04	gal
Note:	Product Displacement = Product Thickness x Product Specific Gravity (0.87) Corrected Depth to Water = Observed Depth to Water - Product Displacement Corrected G.W. Elevation = Casing Elevation - Corrected Depth to Water								

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-39								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
8/8/94	12.37	-	8.56	0	-	3.81	3.81	0.00	
8/30/94	12.37	-	11.18	0	-	1.19	1.19	0.00	
9/22/94	12.37	-	9.72	0	-	2.65	2.65	0.00	
10/14/94	12.37	-	10.98	0	-	1.39	1.39	0.00	
11/8/94	12.37	-	10.66	0	-	1.71	1.71	0.00	Skimmer Removed
1/4/95	12.37	-	10.45	0	-	1.92	1.92	0.00	
5/12/95	12.37	10.55	10.55	0	1.82	1.82	1.82	0.00	
5/23/95	12.37	-	11.28	-	-	1.09	-	0.00	
5/30/95	12.37	-	11.02	-	-	1.35	-	0.00	
6/6/95	12.37	-	11.26	-	-	1.11	-	0.00	
6/12/95	12.37	-	10.21	-	-	2.16	-	0.00	
7/21/95	12.37	10.87	10.88	0.01	1.50	1.49	1.50	0.00	
7/28/95	12.37	-	10.04	-	-	2.33	-	0.00	
7/31/95	12.37	9.41	9.41	0	2.96	2.96	2.96	0.00	
8/4/95	12.37	-	10.96	0	-	1.41	1.41	0.00	
8/8/95	12.37	sheen	10.22	<0.01	2.15	2.15	2.16	0.00	
8/11/95	12.37	8.87	8.87	<0.01	0.00	3.5	3.51	0.00	
8/15/95	12.37	8.88	8.88	<0.01	3.49	3.49	3.50	0.00	
8/21/95	12.37	-	10.56	0	1.81	1.81	1.82	0.00	
8/25/95	12.37	10.90	10.90	<0.01	1.47	1.47	1.48	0.00	
8/29/95	12.37	-	9.01	0	3.36	3.36	3.37	0.00	
9/6/95	12.37	11.05	11.05	<0.01	1.32	1.32	1.33	0.00	
9/12/95	12.37	9.83	9.83	<0.01	2.54	2.54	2.55	0.00	
9/15/95	12.37	11.35	11.35	<0.01	1.02	1.02	1.03	0.00	
9/19/95	12.37	10.97	10.97	<0.01	1.40	1.4	1.41	0.00	
9/22/95	12.37	-	10.02	0	2.35	2.35	2.35	0.00	
9/25/95	12.37	8.72	8.72	<0.01	3.65	3.65	3.66	0.00	
10/3/95	12.37	10.59	10.60	0.01	1.77	1.77	1.78	0.00	
10/6/95	12.37	9.57	9.58	0.01	2.79	2.79	2.80	0.00	
10/11/95	12.37	8.91	8.92	0.01	3.45	3.45	3.46	0.00	

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-39								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
10/18/95	12.37	11.40	11.41	0.01	0.96	0.96	0.97	0.00	
11/1/95	12.37	10.99	11.00	0.01	1.37	1.37	1.38	0.00	
11/7/95	12.37	9.49	9.50	0.01	2.87	2.87	2.88	0.00	
	12.37			0	12.37		12.37	0.00	
Total Product Removed (gal):								0.00	gal
Note:	Product Displacement = Product Thickness x Product Specific Gravity (0.87) Corrected Depth to Water = Observed Depth to Water - Product Displacement Corrected G.W. Elevation = Casing Elevation - Corrected Depth to Water								
Note:	This well was installed on 7/19/94								

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-41								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
11/8/94	9.52	-	5.55	0	-	3.97	3.97	0.00	
1/4/95	9.52	-	5.48	0	-	4.04	4.04	0.00	Skimmer Removed
4/19/95	9.52	5.42	5.42	0	4.10	4.1	4.10	0.00	
5/2/95	9.52	5.55	5.55	0	3.97	3.97	3.97	0.00	
5/12/95	9.52	5.51	5.51	0	4.01	4.01	4.01	0.00	
5/23/95	9.52	-	5.65	0	-	3.87	3.87	0.00	
5/30/95	9.52	5.51	5.51	0	4.01	4.01	4.01	0.00	
6/6/95	9.52	-	5.54	0	-	3.98	3.98	0.00	
6/12/95	9.52	-	5.49	0	-	4.03	4.03	0.00	
7/21/95	9.52	5.39	5.39	0	4.13	4.13	4.13	0.00	
7/28/95	9.52	n/a	n/a	n/a	n/a	n/a	n/a	0.00	
7/31/95	9.52	n/a	n/a	n/a	n/a	n/a	n/a	0.00	
8/4/95	9.52	sheen	5.44	<0.01	4.08	4.08	4.09	0.00	
8/8/95	9.52	5.55	5.55	<0.01	3.97	3.97	3.97	0.00	
8/11/95	9.52	5.44	5.44	<0.01	4.08	4.08	4.08	0.00	
8/15/95	9.52	5.58	5.58	<0.01	3.94	3.94	3.94	0.00	
8/21/95	9.52	-	5.53	0	3.99	3.99	3.99	0.00	
8/25/95	9.52	-	5.73	0	3.79	3.79	3.79	0.00	
8/29/95	9.52	-	5.65	0	3.87	3.87	3.87	0.00	
9/6/95	9.52	5.74	5.74	<0.01	3.78	3.78	3.78	0.00	
9/12/95	9.52	-	5.81	0	3.71	3.71	3.71	0.00	
9/15/95	9.52	-	5.95	0	3.57	3.57	3.57	0.00	
9/19/95	9.52	5.78	5.78	<0.01	3.74	3.74	3.75	0.00	
9/22/95	9.52	-	9.96	0	-0.44	-0.44	-0.44	0.00	
9/25/95	9.52	5.42	5.42	<0.01	4.10	4.1	4.11	0.00	
10/3/95	9.52	5.52	5.53	0.01	3.99	3.99	4.00	0.00	
10/6/95	9.52	5.31	5.31	<0.01	4.21	4.21	4.22	0.00	
10/11/95	9.52	5.46	5.47	0.01	4.06	4.05	4.06	0.00	

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	MW-41								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
10/18/95	9.52	5.72	5.73	0.01	3.79	3.79	3.80	0.00	
11/1/95	9.52	5.57	5.58	0.01	3.94	3.94	3.95	0.00	
11/7/95	9.52	5.22	5.23	0.01	4.29	4.29	4.30	0.00	
	9.52					9.52	9.52		
Total Product Removed (gal):								0.00	gal
Note:	Product Displacement = Product Thickness x Product Specific Gravity (0.87) Corrected Depth to Water = Observed Depth to Water - Product Displacement Corrected G.W. Elevation = Casing Elevation - Corrected Depth to Water								
Note:	This well was installed on 7/19/94								

TABLE 4-2 (Continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	RW-1								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
1/4/95	7.47	4.75	6.20	1.45	2.72	1.27	2.53	0.00	
1/27/95	7.47	4.69	5.05	0.36	2.78	2.42	2.73	0.50	
1/30/95	7.47	n/a	n/a	n/a	n/a	n/a	n/a	0.05	No Levels Taken
2/1/95	7.47	3.64	4.74	1.1	3.83	2.73	3.69	0.50	
2/2/95	7.47	4.77	4.84	0.07	2.70	2.63	2.69	0.11	
2/3/95	7.47	4.91	5.38	0.47	2.56	2.09	2.50	0.10	
2/10/95	7.47	-	-	-	-	-	-	1.00	No Levels Taken
2/16/95	7.47	5.78	6.09	0.31	1.69	1.38	1.65	0.59	38 oz
2/23/95	7.47	-	-	-	-	-	-	0.59	38 oz
3/3/95	7.47	4.60	5.70	1.1	2.87	1.77	2.73	0.48	31 oz
3/9/95	7.47	4.35	5.32	0.97	3.12	2.15	2.99	0.83	53 oz
3/17/95	7.47	4.54	5.51	0.97	2.93	1.96	2.80	0.75	48 oz
3/27/95	7.47	4.79	5.95	1.16	2.68	1.52	2.53	0.50	
3/31/95	7.47	4.39	5.85	1.46	3.08	1.62	2.89	0.30	
4/4/95	7.47	4.34	5.59	1.25	3.13	1.88	2.97	0.50	
4/11/95	7.47	4.96	6.37	1.41	2.51	1.1	2.33	0.39	
4/19/95	7.47	4.29	5.57	1.28	3.18	1.9	3.01	0.50	
5/2/95	7.47	3.93	5.74	1.81	3.54	1.73	3.30	0.50	
5/12/95	7.47	3.97	5.85	1.88	3.50	1.62	3.26	0.50	
5/23/95	7.47	4.35	6.02	1.67	3.12	1.45	2.90	0.50	
5/30/95	7.47	4.16	6.05	1.89	3.31	1.42	3.06	0.40	
6/6/95	7.47	4.17	6.18	2.01	3.30	1.29	3.04	0.10	
6/12/95	7.47	3.89	5.77	1.88	3.58	1.7	3.34	0.50	
6/15/95	7.47	-	-	no	data	collected	-	0.25	
7/21/95	7.47	5.25	7.00	1.75	2.22	0.47	1.99	0.50	
7/28/95	7.47	5.43	7.80	2.37	2.04	-0.33	1.73	0.20	
7/31/95	7.47	5.41	7.59	2.18	2.06	-0.12	1.78	0.25	
8/4/95	7.47	5.34	7.42	2.08	2.13	0.05	1.86	0.20	

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	RW-1								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
8/8/95	7.47	5.18	7.13	1.95	2.29	0.34	2.04	0.07	
8/11/95	7.47	5.03	7.07	2.04	2.44	0.4	2.17	0.25	
8/15/95	7.47	5.13	7.43	2.3	2.34	0.04	2.04	0.10	
8/21/95	7.47	4.87	6.86	1.99	2.60	0.61	2.34	0.75	
8/25/95	7.47	5.41	7.48	2.07	2.06	-0.01	1.79	0.47	
8/29/95	7.47	5.30	6.99	1.69	2.17	0.48	1.95	0.63	
9/6/95	7.47	5.36	7.09	1.73	2.11	0.38	1.89	0.50	
9/12/95	7.47	5.35	6.89	1.54	2.12	0.58	1.92	0.63	
9/15/95	7.47	5.67	7.35	1.68	1.80	0.12	1.58	0.63	
9/19/95	7.47	5.64	7.07	1.43	1.83	0.4	1.64	0.67	
9/22/95	7.47	5.37	6.64	1.27	2.10	0.83	1.93	0.17	
9/25/95	7.47	5.39	6.72	1.33	2.08	0.75	1.91	0.14	
10/3/95	7.47	5.27	6.43	1.16	2.20	1.04	2.05	0.55	
10/6/95	7.47	5.12	6.11	0.99	2.35	1.36	2.22	0.52	
10/11/95	7.47	5.34	6.63	1.29	2.13	0.84	1.96	0.03	
10/18/95	7.47	5.92	7.34	1.42	1.55	0.13	1.37	0.52	
11/1/95	7.47	5.80	6.98	1.18	1.67	0.49	1.52	0.42	
11/7/95	7.47	5.43	6.45	1.02	2.04	1.02	1.91	0.66	
	7.47			0	7.47	7.47	7.47		
Total Product Removed (gal):								19.30	gal
Note:	Product Displacement = Product Thickness x Product Specific Gravity (0.87) Corrected Depth to Water = Observed Depth to Water - Product Displacement Corrected G.W. Elevation = Casing Elevation - Corrected Depth to Water								
Note:	This well was installed on 12/07/94								

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	RW-2								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
1/4/95	7.33	4.67	5.29	0.62	2.66	2.04	2.59	0.00	
1/27/95	7.33	4.56	4.88	0.32	2.77	2.45	2.73	0.50	
1/30/95	7.33	n/a	n/a	n/a	n/a	n/a	n/a	0.08	No Levels Taken
2/1/95	7.33	4.18	4.21	0.03	3.15	3.12	3.15	0.30	
2/2/95	7.33	4.55	4.74	0.19	2.78	2.59	2.76	0.08	
2/3/95	7.33	5.96	6.00	0.04	1.37	1.33	1.37	0.10	
2/10/95	7.33	-	-	-	-	-	-	0.25	No Levels Taken
2/16/95	7.33	5.78	6.09	0.31	1.55	1.24	1.51	0.50	
2/23/95	7.33	-	-	-	-	-	-	0.53	No Levels Taken
3/3/95	7.33	4.38	5.39	1.01	2.95	1.94	2.83	0.25	
3/9/95	7.33	4.43	5.70	1.27	2.90	1.63	2.75	0.16	
3/17/95	7.33	4.29	5.77	1.48	3.04	1.56	2.86	0.31	
3/27/95	7.33	4.51	5.95	1.44	2.82	1.38	2.65	0.28	
3/31/95	7.33	4.17	5.95	1.78	3.16	1.38	2.95	0.20	
4/4/95	7.33	4.13	5.75	1.62	3.20	1.58	3.01	0.20	
4/11/95	7.33	4.75	6.45	1.7	2.58	0.88	2.38	0.11	
4/19/95	7.33	4.02	5.87	1.85	3.31	1.46	3.09	0.28	
5/2/95	7.33	3.67	6.01	2.34	3.66	1.32	3.38	0.50	
5/12/95	7.33	3.74	6.20	2.46	3.59	1.13	3.29	0.50	
5/23/95	7.33	4.41	6.58	2.17	2.92	0.75	2.66	0.50	
5/30/95	7.33	3.93	6.35	2.42	3.40	0.98	3.11	0.60	
6/6/95	7.33	3.93	6.35	2.42	3.40	0.98	3.11	0.65	
6/12/95	7.33	3.61	5.93	2.32	3.72	1.4	3.44	0.60	
7/21/95	7.33	5.25	7.13	1.88	2.08	0.2	1.85	1.50	
7/28/95	7.33	5.25	7.84	2.59	2.08	-0.51	1.77	0.50	
7/31/95	7.33	5.23	7.63	2.4	2.10	-0.3	1.81	0.25	
8/4/95	7.33	5.19	7.54	2.35	2.14	-0.21	1.86	0.07	
8/8/95	7.33	4.98	6.93	1.95	2.35	0.4	2.12	0.07	

TABLE 4-2 (continued)
MONITORING AND RECOVERY WELL LIQUID MEASUREMENTS
PLATTY KILL CREEK VICINITY

BAYONNE INDUSTRIES, INC.,
BAYONNE, NJ
March 21, 1994 to November 7, 1995

	RW-2								
DATE	CASING ELEVATION (ft)	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	PRODUCT THICKNESS (ft)	PRODUCT ELEVATION (ft)	GROUNDWATER ELEVATION (ft)	CORRECTED G.W. ELEVATION (ft)	PRODUCT REMOVED (gal)	COMMENTS
8/11/95	7.33	4.84	6.96	2.12	2.49	0.37	2.24	0.25	
8/15/95	7.33	4.98	7.07	2.09	2.35	0.26	2.10	0.20	
8/21/95	7.33	4.69	6.76	2.07	2.64	0.57	2.39	0.07	
8/25/95	7.33	5.24	7.43	2.19	2.09	-0.1	1.83	0.17	
8/29/95	7.33	5.09	7.20	2.11	2.24	0.13	1.99	0.13	
9/6/95	7.33	5.14	7.23	2.09	2.19	0.1	1.94	0.14	
9/12/95	7.33	5.13	7.12	1.99	2.20	0.21	1.96	0.13	
9/15/95	7.33	5.57	7.67	2.1	1.76	-0.34	1.51	0.13	
9/19/95	7.33	5.41	7.40	1.99	1.92	-0.07	1.68	0.09	
9/22/95	7.33	5.13	6.89	1.76	2.20	0.44	1.99	0.14	
9/25/95	7.33	5.16	6.97	1.81	2.17	0.36	1.95	0.13	
10/3/95	7.33	6.39	7.23	0.84	0.94	0.1	0.84	0.03	
10/6/95	7.33	5.01	6.48	1.47	2.32	0.85	2.14	0.08	
10/11/95	7.33	5.17	6.54	1.37	2.16	0.79	2.00	0.17	
10/18/95	7.33	5.87	7.55	1.68	1.46	-0.22	1.26	0.15	
11/1/95	7.33	5.92	7.39	1.47	1.41	-0.06	1.23	0.06	
11/7/95	7.33	5.69	6.95	1.26	1.64	0.38	1.49	0.13	
Total Product Removed (gal):								12.07	gal
Note:	Product Displacement = Product Thickness x Product Specific Gravity (0.87) Corrected Depth to Water = Observed Depth to Water - Product Displacement Corrected G.W. Elevation = Casing Elevation - Corrected Depth to Water								
Note:	This well was installed on 12/05/94								

product measurements in the vicinity of the Platty Kill Canal, three separate product plumes are suspected in this area.

4.4.2 Free-phase Product Measurements - Recovery Wells

Liquid measurements were collected from recovery wells Y2-PKB-RW-1, Y2-PKB-RW-2, and Y2-PKB-RW-3 in January and June, 1995, as part of the site-wide liquid measurement program, in addition to every time the passive skimmers installed onto these wells were emptied. Free-phase product thicknesses ranging from 0.31 to 2.59 feet were measured in recovery wells Y2-PKB-RW-1 and Y2-PKB-RW-2. Free-phase product has not been detected in recovery well Y2-PKB-RW-3, which is located closest to the canal at the intersection of the bulkhead and product curtain. Tables 4-1 and 4-2 provides the free-phase product measurements collected from the three newly installed recovery wells.

4.4.3 Product Bail-Down Tests

Product bail-down tests were conducted on recovery wells Y2-PKB-RW-1 and Y2-PKB-RW-3 and monitoring wells MW-5 and MW-20. The tabulated and plotted results of the product bail-down tests for the two recovery wells and monitoring well MW-20 are provided in Appendix H. The product baildown test on monitoring well MW-5 was aborted due to the high viscosity of the free-phase product in the well.

The results for MW-20 and Y2-PKB-RW-2 are presented on graphs on Figures H-1, H-2 and H-3 in Appendix H. The plotted data for these graphs are typical of *Type One* curves (Gruszczenski, 1987). These curves are characterized by both a rising water-product interface and a rising top of product level and indicate that the product thickness recorded in the well (during the test) is the actual thickness within the formation. There is no inflection point with *Type One* curves. Based on these curves, the actual product thickness within the formation for wells MW-20 and Y2-PKB-RW-2 is 0.06 foot and 0.15 foot, respectively.

The graphically plotted results for Y2-PKB-RW-1 is typical of a *Type Two* curve and is presented on Figure H-4. This curve type is characterized by a rising product level and a water level that first rises then falls. This curve type displays the inflection point where the water level begins to fall (as discussed earlier). Based on the curve for Y2-PKB-RW-1, the actual product thickness within the formation is 0.11 foot.

The capillary fringe for Y2-PKB-RW-1 has been determined to be 0.06 foot. The test data for Y2-PKB-RW-1 indicates that when the apparent product thickness in the well was reduced to a sheen, product recharged immediately into the well; within one hour the product

accumulation in the well was 0.30 foot. Based on this rate of product recharge per hour, approximately 10 gallons per day could potentially be recovered from recovery well Y2-PKB-RW-1. The test data for Y2-PKB-RW-2 indicates that product accumulation was slower; within one hour the product accumulation in the well was 0.10 foot. Based on this rate of product recharge per hour, approximately 3 gallons per day could be potentially recovered from recovery Y2-PKB-RW-2.

4.4.4 Free-phase Product Characterization

Results of the fingerprint and forensic analyses of free-phase product samples collected from monitoring wells MW-5 and MW-20, and from recovery wells Y2-PKB-RW-1 and Y2-PKB-RW-2 are provided in Appendix I. In reference to Appendix I, the ILFC report indicates that wells Y2-PKB-RW-1, Y2-PKB-RW-2 and MW-20 contain a mixture of gasoline, diesel and light lubricating oils. The sample collected from monitoring well MW-5 contained some gasoline components, MTBE, hydrocarbons ranging from diesel to oils and molecular sulfur. The overall chromatographic pattern for monitoring well MW-5 is similar to crude oil. The product analyses indicates the presence of two separate, localized product plumes occurring in the vicinity of the Platty Kill Canal. One in the area of the product curtain which is composed of a mixture of gasoline/diesel/light oils, and one in the vicinity of monitoring well MW-5 that is composed of a product similar to crude oil.

4.4.5 Presence and Distribution of Free-phase Product

On January 4, 1995, liquid measurements were collected from all the wells in the vicinity of the Platty Kill Canal. Free-phase product was measured in wells MW-4, MW-5, MW-20, Y2-PKB-RW-1, and Y2-PKB-RW-2 with thickness ranging from 0.02 feet (MW-5) to 1.55 feet (MW-4). Product thickness measurements from these wells are consistent with historic measurements. Of the five wells where free-phase product was detected only MW-4 and Y2-PKB-RW-1 were greater than 1 foot in thickness. To date, monitoring wells MW-15, MW-19, Y2-MW-39, Y2-MW-40, Y2-MW-41, and recovery well Y2-PKB-RW-3 have remained clear of any free-phase product accumulations. Based on the free-phase product distribution in the area of the Platty Kill Canal and product sample results, it is apparent that three separate localized product plumes exist, one in the vicinity of the product curtain (Y2-PKB-RW-1, Y2-PKB-RW-2, and MW-20); a second one around monitoring well MW-5; and the third plume around monitoring well MW-4.

4.5 Free-Phase Product Recovery

On a weekly basis since March 21, 1994, free-phase product accumulations have been removed from the monitoring wells and recovery wells in the vicinity of the Platty Kill Canal. The results of the free-phase product recovery are provided below.

4.5.1 Monitoring Wells

Since March 21, 1994, approximately 10.11 gallons of free-phase product have been recovered from monitoring wells in the vicinity of the Platty Kill Canal. Appendix J contains a cumulative graph showing the weekly total product recovery for the wells in the vicinity of the Platty Kill Canal, between March 1994 and November 1995. The free-phase product was recovered from the wells with passive skimmers (Petrotrap®). Product thickness measurements collected from monitoring wells MW-4, MW-5, MW-15 and MW-20 between February 1993 and February 1994 indicate the presence of free-phase product at thicknesses ranging from 0.01 feet (MW-15, May 1993) to 2.22 feet (MW-5, July 1993). Table 4-2 provides tabulated summaries and Appendix J provides graphs of product recovered from the wells since March 1994. Appendix J also provides product hydrographs for monitoring wells which depict product and groundwater elevations over time. For monitoring well MW-5, the product recovered from the passive skimmer per site visit ranged from 0.02 gallons (July 27, 1994) to 0.50 gallons (January 27, 1995). The free-phase product in MW-5 has significantly decreased through passive skimming and performance of a product bail-down test. Free-phase product thickness in monitoring well MW-5, which was measured to be 2.22 feet in July 1993, was measured to be 0.01 feet on November 7, 1995.

A total of approximately 8.54 gallons of free-phase product has been removed from monitoring well MW-20, including 1.5 gallons that were removed prior to conducting the baildown test. The product recovered from the passive skimmer per site visit ranged from 0.02 gallons to 0.63 gallons. Between March and July 1994, no product accumulations were observed in monitoring well MW-15, thus no product was recovered at this location. As indicated previously, due to the absence of free-phase product, the passive skimmer in monitoring well MW-15 was transferred to monitoring well Y2-MW-39 in July 1994. Due to the absence of free-phase product accumulations in monitoring well Y2-MW-39, the skimmer was later transferred to monitoring well MW-4 in November 1994. Measurements in monitoring well MW-4 historically indicate greater than 1 foot of free-phase product accumulation. Approximately 1.1 gallons of free-phase product has been removed from monitoring well MW-4 between November 8, 1994 and January 17, 1995, at which time the passive skimmer was removed from the monitoring well and installed into one of the recovery wells.

4.5.2 Recovery Wells At The Product Curtain

Since January 4, 1995, approximately 41.37 gallons of free-phase product have been recovered from recovery wells installed on the upgradient side of the product curtain, including five gallons from each recovery well that was removed prior to conducting the baildown tests. The product was recovered from the wells by Petrotrap® passive skimmers. Product thickness measurements collected between January and November 7, 1995 indicate the presence of free-phase product in recovery wells Y2-PKB-RW-1 and Y2-PKB-RW-2 at thicknesses ranging from 0.03 feet (Y2-PKB-RW-2, February 1, 1995) to 2.59 feet (Y2-PKB-RW-2, July 28, 1995). To date, well Y2-PKB-RW-3 has remained clear of product accumulations. Table 4-2 provides tabulated summaries and Appendix J provides graphs of product recovered from the wells since January 1995. As shown in these graphs, the average product recovery per site visit is approximately 0.41 gallons. Appendix J provides product hydrographs of the recovery wells which depict product and groundwater elevations over time.

4.6 Sediment Investigation Results

From October 18 to 21, 1994, sixteen shallow sediment cores (Y9-PKC-SED-01 through Y9-PKC-SED-16) were collected from the bed of Platty Kill Canal using a floating platform mounted vibracoring device. Eight sediment cores were collected outside of the sheetpile dam that separates the Platty Kill Canal and the Kill Van Kull waterways, and eight were collected from inside the sheetpile dam. Figure E-1 in Appendix E provides the sediment core locations. For each core location, one aluminum core tube was driven between 5 and 10 feet into the canal bed. Upon extrusion of the sediment core from the tube, the sediments were characterized and two sediment samples were collected for analysis.

4.6.1 Stratigraphic Characterization - Platty Kill Canal

The sediment coring logs are provided in Appendix K. In reference to Appendix K, the sediments observed in the Platty Kill Canal primarily consist of thin deposits of black silt and clay overlying coarser sediments (i.e., sand and gravel, sand-silt-clay mixtures). In general, the highest PID readings (100 to 166 ppm) were observed at depths greater than 3 feet. The sediment boring logs were used to generate stratigraphic cross sections which are presented on Figure K-1 in Appendix K. Cross Section A-A' identifies the stratigraphic units in the northernmost portion of the Platty Kill Canal, from the earthen dam at the Platty Kill Pond to the bridge spanning the canal. Cross Section B-B' identifies the stratigraphic units from the bridge spanning the canal to the sheetpile dam at the mouth of the Platty Kill Canal. Cross Section C-C' identifies the stratigraphic units across the mouth of the Platty Kill Canal.

Though measurements may be tidally influenced, the bed of the Platty Kill Canal at the time of the sampling program was found to occur between 2 and 15 feet below the water surface. The canal bed topographically slopes towards the Kill Van Kull.

In reference to Cross Section A-A', a silt unit, approximately 5 feet thick, conformably overlies a unit of silt and clay in the northernmost part of the Platty Kill Canal. In the central and southern portions of the Platty Kill Canal, Cross Section B-B', the silt and clay unit occurs from the top of the canal bed to approximately 4 feet below the bed surface. Below 4 feet, underlying the silt and clay unit, silt and clay with varying amounts of coarse sand and gravel were observed. Immediately around the sheet pile dam, Cross Section B-B', silt and clay overlie medium sand with some silt. As shown Cross Section C-C', a silt unit occurs at the mouth of the Platty Kill Canal (south of sediment cores Y9-PKC-SED-12, Y9-PKC-SED-13 and Y9-PKC-SED-15) from 0 to 8 feet below the top of the canal bed. Given the 100-year history of the site, it can be assumed that the Platty Kill Canal sediments have been reworked extensively by either natural (i.e., scour, deposition) or anthropogenic processes (i.e., dredging). An attempt was made to correlate the stratigraphic information obtained from the canal with that of the soil borings obtained from the area adjacent to the canal. However, due to the relative completion depths of the soil and sediment borings and the potential sediment reworking processes, a stratigraphic correlation was not possible.

4.6.2 Grain Size Distribution Analyses

Grain size distribution analysis was to be performed on each of the sediment samples collected, to confirm the sediment characterization. However, due to the oily nature of the sediment collected (all sediments were coated in petroleum), only four out of 32 samples collected for geotechnical analysis could be analyzed. This included two samples each from sediment core Y9-PKC-SED-01 and Y9-PKC-SED-06. The grain size distribution results for these samples are provided contained in Appendix L. Sediment sample Y9-PKC-SED-01A was collected from 0 to 3 feet below the canal bed, in the northern portion of the canal. The sediment in this sample was classified by PSS as black, fine sand and silt with trace amounts of decayed plant and root matter. Sediment sample Y9-PKC-SED-01B was collected from the three to six foot depth interval. The sediment in this sample was classified by PSS as black to dark gray, fine sand with silt and trace amounts of medium sand and decayed plant matter. The PSS classification of this sediment core correlates fairly well with the sample description provided by the ENSR Field Geologist.

Sediment sample Y9-PKC-SED-6B was collected from 4.5 to 5.0 feet below the top of the canal bed, in the central portion of the canal. Sediments in this sample were classified by PSS as dark gray to black, silty fine to coarse sand with trace amounts of fine gravel, cinders,

wood and root matter. Sediment sample Y9-PKC-SED-06C was collected from five to six feet below the canal bed. Sediments in this sample were classified by PSS as dark gray to black fine to coarse sand with some clayey silt. Though the PSS classification of sediment core sample Y9-PKC-SED-6C correlates well with the sample description provided by the ENSR Project Geologist, the description of sample Y9-PKC-SED-6B does not. The ENSR sediment boring log of Y9-PKC-SED-06 (Appendix K) reports a sizable clay fraction (50%) and omits the identification of fine gravel, cinders and root fibers. These discrepancies may be attributed to the manner in which the geotechnical sample is collected or natural heterogeneities occurring with the sample core.

4.6.3 Chemical Analysis

A total of thirty-four sediment samples were collected for analysis of total petroleum hydrocarbons (TPH), pH, and total organic carbon (TOC); two from each sediment core and two duplicate samples. In addition, twelve of these samples, plus two duplicate samples, were further analyzed for target compound list (TCL) volatile and semi-volatile organics and target analyte list (TAL) inorganics. These samples included six samples from three sediment core locations inside of the sheetpile dam, and six samples from three sediment core locations outside of the sheetpile dam. All samples were submitted for chemical analysis to IEA Laboratories, Whippany, New Jersey laboratory certification #14530.

The laboratory analytical results were validated by ENSR's validation group in Acton, Massachusetts. The analytical results were found to be valid and may be used for decision making purposes. Table 4-3 provides a summary of the analytical results of the sediment sampling program. Table 4-3 compares the analytical results to NJDEP's Impact to Groundwater Soil Cleanup Criteria (NJAC 7:26D) and proposed risk-based Alternative Concentration Limits (ACLs). For further discussion on the derivation of the ACLs refer to Section 4.6.4.1. Table 4-4 provides a quick-reference summary of TPH and TOC concentrations for each sediment sample collected. The analytical results for the quality assurance samples have been summarized in Table 4-5. Appendix M provides the validated analytical summary pages for the sediment sampling program. A copy of the IEA analytical report packages for the sediment investigation have been submitted separately.

To aid in the evaluation of the analytical results, the sediments were divided into two depth intervals, the upper zone which includes the zone from the top of the canal bed to a depth of four feet; and the lower zone which includes the sediment zone greater than four feet. The upper and lower zone are discussed separately in the following sections.

For evaluation and presentation purposes, analytical results have been separated into the following groups: total petroleum hydrocarbons (TPH); total benzene, toluene, ethylbenzene and xylenes (BTEX); total semi-volatile organic compounds (SVOC), total polyaromatic hydrocarbons (PAH) and metals.

4.6.3.1 Platty Kill Canal Upper Sediment Zone (0 To 4 Feet)

Total petroleum hydrocarbons in the upper sediment zone were detected in all sixteen samples collected from this zone, at concentrations ranging from 62 ppm (Y9-PKC-SED-12A) to 150,000 ppm (Y9-PKC-SED-03A). The TPH concentrations in the upper sediment zone have been plotted and contoured on Figure N-1 in Appendix N. As shown on Figure N-1, the highest TPH concentrations occur in the northern portion of the Platty Kill Canal, nearest to the earthen dam that separates the canal from the Platty Kill Pond. The isoconcentration lines shown on Figure N-1 depict a TPH concentration gradient which decreases towards the mouth of the Platty Kill Canal. TPH concentrations in the upper zone outside of the sheet pile dam are below 1000 ppm, ranging from 920 to 62 ppm.

Six of the samples from the sediment cores (Y9-PKC-SED-01A, -06A, -08A, -11A, -15A, and -16A) were further analyzed for TCL volatile and semi-volatile organic compounds. Benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected in three of the sediment core samples (Y9-PKC-SED-01A, -06A, and -08A) with concentrations ranging from 0.33 ppm (Y9-PKC-SED-08A) to 33.9 ppm (Y9-PKC-SED-01A). Figure N-2 provides an isoconcentration map of BTEX concentrations in the upper sediment zone. As shown at sample locations Y2-PKC-SED-11A, Y2-PKC-SED-15A and Y2-PKC-SED-16A, BTEX was not detected in the upper sediment zone outside of the sheetpile dam. BTEX concentrations that are greater than 1 ppm remain in the most northern reaches of the canal. Based on the isoconcentration maps, there is good correlation in terms of the BTEX and TPH concentration distribution in the sediment.

Semi-volatile compounds (SVOC) were detected in all six sediment cores, with total SVOC concentrations ranging from 16.57 ppm (Y9-PKC-SED-15A) to 1088 ppm (Y9-PKC-SED-01A). Of the SVOC detected in these sediment cores, polyaromatic hydrocarbon compounds (PAHs) make up a significant portion (19% to 81%) of the SVOCs detected. PAH concentrations range from 8.99 ppm (Y9-PKC-SED-15A) to 432.8 ppm (Y9-PKC-SED-01A). The SVOC and PAH concentrations in the upper sediment zone have been plotted and contoured on Figures N-3 and Figure N-4, respectively. The highest SVOC and PAH concentrations occur in the northern portion of the Platty Kill Canal. The SVOC and PAH concentration gradient decreases steeply towards the mouth of the Platty Kill Canal. Total SVOC and PAH concentrations in the upper sediment zone outside of the sheetpile dam were at or below 123 ppm and 100 ppm, respectively. As with the BTEX concentrations, the distribution of SVOC

TABLE 4-3
SUMMARY OF ANALYTICAL RESULTS
PLATTY KILL CANAL SEDIMENT INVESTIGATION
PLATTY KILL CANAL INTERIM REMEDIAL ACTION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

ANALYTE / SAMPLING NAME / LAB ID NUMBER / SAMPLING DEPTH / SAMPLING DATE	PKCSED-01A 44159007 0-3 ft. 11/03/94	PKCSED-6A 44142005 0-4.5 ft. 10/20/94	PKCSED-8A 44142001 0-3.25 ft. 10/20/94	IMPACT TO GROUNDWATER CRITERIA	RISKED-BASED ALTERNATIVE CLEANUP LEVELS
VOLATILE ORGANICS					
Acetone			0.22J	100	NC
Benzene	3.3J	0.014J		1	2820
Chlorobenzene	13 J			1	NC
Ethylbenzene	24 J			NC	NC
Xylenes (total)	6.6J	0.017J	0.033J	NC	NC
SEMI-VOLATILE ORGANICS					
1,3-dichlorobenzene	7.6J			NC	NC
1,4-dichlorobenzene	15 J			NC	NC
2-Methylnaphthalene	560 J	2.3 J	0.34J	NC	NC
4-chloroaniline			0.47J	NC	NC
Acenaphthene	46	2.8 J	0.45J	100	NC
Acenaphthylene	2.6J			NC	NC
Anthracene	16		0.91J	100	NC
Benzo(a)anthracene	16	2.1 J	0.78J	500	150
Benzo(a)pyrene	11 J	1.3 J	0.65J	100	15
Benzo(b)fluoranthene	6.4J	1.1 J	0.65J	50	150
Benzo(g,h,i)Perylene	2.8J	0.7 J	0.28J	NC	NC
Benzo(k)fluoranthene	2.4J	0.59J	0.46J	500	1500
Bis(2-ethylhexyl)phthalate	26	25 BJ	16 BJ	100	7800
Chrysene	28		1.2 J	500	15000
Di-n-octylphthalate	3.6J	3.5 J	1.6 J	NC	NC
Dibenzofuran	27			NC	NC
Fluoranthene	13 J	4.7 J	1.9 J	NC	NC
Fluorene	67			NC	NC
Indeno(1,2,3-c,d)pyrene	1.6J		0.17J	NC	150
Isophorone	16	3.1 J	0.6 J	NC	NC
Naphthalene		0.77J	0.12J	NC	NC
Phenanthrene	170	7.6 J	1.4 J	NC	NC
Pyrene	50	4.9 J	2.6 J	NC	NC

All results expressed in parts per million.
Blank = Not Detected or Not Analyzed
J = Estimated Value
B = Detected in an associated blank.
NC = No Criteria
* = Duplicate of previous sample.

TABLE 4-3 (CONT'D)
SUMMARY OF ANALYTICAL RESULTS
PLATTY KILL CANAL SEDIMENT INVESTIGATION
PLATTY KILL CANAL INTERIM REMEDIAL ACTION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

ANALYTE / SAMPLING NAME / LAB ID NUMBER / SAMPLING DEPTH / SAMPLING DATE	PKCSED-01A 44159007 0-3 ft. 11/03/94	PKCSED-6A 44142005 0-4.5 ft. 10/20/94	PKCSED-8A 44142001 0-3.25 ft. 10/20/94	IMPACT TO GROUNDWATER CRITERIA	RISKED-BASED ALTERNATIVE CLEANUP LEVELS
INORGANICS					
Aluminium	6110 J	4900 J	16900 J	NC	NC
Arsenic	324 J	12.2 J	24.4 J	NC	683
Barium	1330	59.7	166	NC	583000
Beryllium	0.57B	0.36B	1.2 B	NC	NC
Cadmium	4.3	2.8	8.5	NC	NC
Calcium	7230 J	1590 J	5990 J	NC	NC
Chromium	R	98.1 J	292 J	NC	NC
Cobalt	27.4	2.8 B	9.2 B	NC	NC
Copper	779	205	602	NC	326000
Iron	93000	11600 J	33600 J	NC	NC
Lead	4700 J	164 J	351 J	NC	NC
Magnesium	5630 J	2820 J	8440 J	NC	NC
Manganese	234 J	109 J	415 J	NC	NC
Mercury	0.35	2	6.7	NC	NC
Nickel	125	22	57.3	NC	NC
Potassium	R	1200 J	3990 J	NC	NC
Selenium	R	0.48J		NC	NC
Silver		2 J	8.1 J	NC	NC
Sodium	3190	5450	10200	NC	NC
Thallium	0.25J		0.76J	NC	NC
Vanadium	117	23.3 J	62.2 J	NC	NC
Zinc	1010 J	194 J	634 J	NC	NC

All results expressed in parts per million.
Blank = Not Detected or Not Analyzed
J = Estimated Value
B = Detected in an associated blank.
NC = No Criteria
R = Rejected Analysis
* = Duplicate of previous sample.

TABLE 4-3 (CONT'D)
SUMMARY OF ANALYTICAL RESULTS
PLATTY KILL CANAL SEDIMENT INVESTIGATION
PLATTY KILL CANAL INTERIM REMEDIAL ACTION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

ANALYTE / SAMPLING NAME / LAB ID NUMBER / SAMPLING DEPTH / SAMPLING DATE	PKCSED-11A 44171005 0-2.5 ft. 10/19/94	PKCSED-15A 44084004 0-4.25 ft. 10/18/94	PKCSED-16A 44084003 0-5 ft. 10/18/94	IMPACT TO GROUNDWATER CRITERIA	RISKED-BASED ALTERNATIVE CLEANUP LEVELS
VOLATILE ORGANICS					
Acetone		0.36J	170 J	100	NC
SEMI-VOLATILE ORGANICS					
2-Methylnaphthalene	3.2 J	0.14J	0.61J	NC	NC
Acenaphthene	12	0.11J	0.41J	100	NC
Acenaphthylene	0.48J	0.21J		NC	NC
Anthracene	6.9 J	0.48J	1 J	100	NC
Benzo(a)anthracene	3.4 J	0.78J	0.91J	500	150
Benzo(a)pyrene	1.8 J	0.75J	0.96J	100	15
Benzo(b)fluoranthene	1.8 J	0.73J	0.93J	50	150
Benzo(g,h,i)Perylene	0.65J	0.22J	0.58J	NC	NC
Benzo(k)fluoranthene	1.2 J	0.63J	0.75J	500	1500
Bis(2-ethylhexyl)phthalate	12 JB	6.6 J	16 J	100	7800
Butylbenzylphthalate		0.37J		100	NC
Carbazole	0.62J			NC	NC
Chrysene	3.4 J	0.91J	1.3 J	500	15000
Di-n-octylphthalate	1.3 J	0.37J	0.56J	NC	NC
Dibenzofuran	5.9 J			NC	NC
Fluoranthene	18 J	1.4 J	2.3 J	NC	NC
Fluorene	10 J	0.15J		NC	NC
Indeno(1,2,3-c,d)pyrene	0.7 J	0.22J	0.52J	NC	150
Naphthalene	1.7 J	0.18J		NC	NC
Phenanthrene	26 J	0.42J	1.4 J	NC	NC
Pyrene	12 J	1.8 J	2.1 J	NC	NC

All results expressed in parts per million.
Blank = Not Detected or Not Analyzed
J = Estimated Value
B = Detected in an associated blank.
NC = No Criteria
* = Duplicate of previous sample.

TABLE 4-3 (CONT'D)
SUMMARY OF ANALYTICAL RESULTS
PLATTY KILL CANAL SEDIMENT INVESTIGATION
PLATTY KILL CANAL INTERIM REMEDIAL ACTION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

ANALYTE / SAMPLING NAME / LAB ID NUMBER / SAMPLING DEPTH / SAMPLING DATE	PKCSED-11A 44171005 0-2.5 ft. 10/19/94	PKCSED-15A 44084004 0-4.25 ft. 10/18/94	PKCSED-16A 44084003 0-5 ft. 10/18/94	IMPACT TO GROUNDWATER CRITERIA	RISKED-BASED ALTERNATIVE CLEANUP LEVELS
INORGANICS					
Aluminium	16200 J	16800	15000	NC	NC
Arsenic	27.3	13.8	18.4	NC	683
Barium	150	124	129	NC	583000
Beryllium	1 B	1.1 B	0.89B	NC	NC
Cadmium	5.4	2.7	3.5	NC	NC
Calcium	6860 J	R	R	NC	NC
Chromium	211 J	137	155	NC	NC
Cobalt	12.7 B	14.6	11.9	NC	NC
Copper	268	168	209	NC	326000
Iron	39500 J	37000	36000	NC	NC
Lead	222	203 J	191 J	NC	NC
Magnesium	9930 J	11700	8470	NC	NC
Manganese	468	552	544	NC	NC
Mercury	3.5	2.2	2.7	NC	NC
Nickel	68.6	76.3	43	NC	NC
Potassium	R	4150 J	3280 J	NC	NC
Silver	7.4	8.3	7.5	NC	NC
Sodium	10700	11000	8970	NC	NC
Vanadium	51.6 J	52.4	48.4	NC	NC
Zinc	401 J	300	339	NC	NC

All results expressed in parts per million.
Blank = Not Detected or Not Analyzed
J = Estimated Value
B = Detected in an associated blank.
NC = No Criteria
R = Rejected Analysis
* = Duplicate of previous sample.

TABLE 4-3 (CONT'D)
SUMMARY OF ANALYTICAL RESULTS
PLATTY KILL CANAL SEDIMENT INVESTIGATION
PLATTY KILL CANAL INTERIM REMEDIAL ACTION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

ANALYTE / SAMPLING NAME	PKCSED-01B	PKCSED-6B	PKCSED-6C*	PKCSED-8B	IMPACT TO GROUNDWATER CRITERIA	RISKED-BASED ALTERNATIVE CLEANUP LEVELS
LAB ID NUMBER	44149008	44142006	44142007	44142002		
SAMPLING DEPTH	3-6 ft.	4.5-9 ft.	4.5-9 ft.	3.25-6.5 ft.		
SAMPLING DATE	10/21/94	10/20/94	10/20/94	10/20/94		
VOLATILE ORGANICS						
1,2-Dichloroethane	0.73J				1	1070
Benzene	28 J	2.7 J	3.1 J	0.017 J	1	2820
Chlorobenzene	65 J			0.14 J	1	NC
Ethylbenzene	57 J	23 J	24 J		100	NC
Toluene	1 J	5.7 J	3.9 J		500	NC
Xylenes (total)	81 J	98 J	79 J	0.027 J	10	NC
SEMI-VOLATILE ORGANICS						
1,4-dichlorobenzene				0.66J	100	NC
2-Methylnaphthalene	240 J	220 J	330 J	11 J	NC	NC
Acenaphthene	22	14 J	19 J	2.6 J	100	NC
Acenaphthylene	2.8 J			1.1 J	NC	NC
Anthracene	13			3.7 J	100	NC
Benzo(a)anthracene	9.7 J	9 J	14 J	2.2 J	500	150
Benzo(a)pyrene	7.6 J	5.9 J	9.2 J	1.4 J	100	15
Benzo(b)fluoranthene	4.9 J	3.2 J	5.3 J	0.97J	50	150
Benzo(g,h,i)Perylene	2.2 J	3.7 J	6.2 J	0.6 J	NC	NC
Benzo(k)fluoranthene	3.1 J			0.63J	500	1500
Bis(2-ethylhexyl)phthalate	12 J	7.9 J	8.6 J	16 BJ	100	7800
Carbazole	4 J			0.61J	NC	NC
Chrysene	13 J	12 J	18 J	2.8 J	500	15000
Di-n-octylphthalate	3.5 J			1.1 J	100	NC
Dibenzofuran	12 J			0.51J	NC	NC
Fluoranthene	12 J	10 J	14 J	4.9 J	100	NC
Fluorene	32	24 J	35 J	3.1 J	100	NC
Indeno(1,2,3-c,d)pyrene		3.1 J			500	150
Isophorone	12 J		5.2 J		50	NC
Naphthalene		66 J	95 J	2.4 J	100	NC
Phenanthrene	78	64 J	92 J	10 J	NC	NC
Pyrene	31	24 J	35 J	5.4 J	100	NC

All results expressed in parts per million.
Blank = Not Detected or Not Analyzed
J = Estimated Value
B = Detected in an associated blank.
NC = No Criteria
* = Duplicate of previous sample.

TABLE 4-3 (CONT'D)
SUMMARY OF ANALYTICAL RESULTS
PLATTY KILL CANAL SEDIMENT INVESTIGATION
PLATTY KILL CANAL INTERIM REMEDIAL ACTION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

ANALYTE / SAMPLING NAME / LAB ID NUMBER / SAMPLING DEPTH / SAMPLING DATE	PKCSED-01B 44149008 3-6 ft. 10/21/94	PKCSED-6B 44142006 4.5-9 ft. 10/20/94	PKCSED-6C* 44142007 4.5-9 ft. 10/20/94	PKCSED-8B 44142002 3.25-6.5 ft. 10/20/94	IMPACT TO GROUNDWATER CRITERIA	RISKED-BASED ALTERNATIVE CLEANUP LEVELS
INORGANICS						
Aluminium	6220 J	6070 J	8490 J	14400 J	NC	NC
Arsenic	145 J	37.3 J	44 J	54.9 J	NC	683
Barium	200	111	128	297	NC	583000
Beryllium	0.49B	0.53B	0.72B	1.2 B	NC	NC
Cadmium	3	4.4	5.7	13.5	NC	NC
Calcium	5680 J	2490 J	3240 J	8880 J	NC	NC
Chromium	R	189 J	238 J	441 J	NC	NC
Cobalt	8.2	5.7	6.8 B	14.5	NC	NC
Copper	900	216	281	696	NC	326000
Iron	40500	18700 J	25100 J	45000 J	NC	NC
Lead	1300 J	521 J	698 J	741 J	NC	NC
Magnesium	6000 J	3160 J	4090 J	7360 JE	NC	NC
Manganese	163 J	164 J	223 J	1670 J	NC	NC
Mercury	4.5	2.1	2.4	6.8	NC	NC
Nickel	183	28.3	37.2	74	NC	NC
Potassium	R	1350 J	1830 J	2880 J	NC	NC
Selenium	R	1 J	1.3 J	1.6 J	NC	NC
Silver		1.2 J	3.8 J	11.4 J	NC	NC
Sodium	3710	3920	5120	3760	NC	NC
Thallium	0.32J			0.54J	NC	NC
Vanadium	41.3	16.8 J	41.6 J	82.3 J	NC	NC
Zinc	453 J	344 J	492 J	748 J	NC	NC

All results expressed in parts per million.
Blank = Not Detected or Not Analyzed
J = Estimated Value
B = Detected in an associated blank.
E = Serial Dilution is not within Control Limits
NC = No Criteria
R = Rejected Analysis
* = Duplicate of previous sample.

TABLE 4-3 (CONT'D)
SUMMARY OF ANALYTICAL RESULTS
PLATTY KILL CANAL SEDIMENT INVESTIGATION
PLATTY KILL CANAL INTERIM REMEDIAL ACTION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

ANALYTE / SAMPLING NAME / LAB ID NUMBER / SAMPLING DEPTH / SAMPLING DATE	PKCSED-11B 44171006 2.5-5 ft. 10/19/94	PKCSED-15B 44084005 4.25-8.5 ft. 10/18/94	PKCSED-16B 44084002 5-10 ft. 10/18/94	PKCSED-16C* 44084001 5-10 ft. 10/18/94	IMPACT TO GROUNDWATER CRITERIA	RISKED-BASED ALTERNATIVE CLEANUP LEVELS
VOLATILE ORGANICS						
Acetone		0.13J			100	NC
Chlorobenzene			1.5 J	0.49J	1	NC
Xylenes (total)			3 J	1.5 J	NC	NC
SEMI-VOLATILE ORGANICS						
1,4-dichlorobenzene			0.72J	0.61J	NC	NC
2-Methylnaphthalene	1.9 J	1 J	12 J	9.3 J	NC	NC
4-chloroaniline	0.7				NC	NC
Acenaphthene		0.61J	2.5 J	2 J	100	NC
Anthracene	1.6 J	1.5 J	11 J	9.9 J	100	NC
Benzo(a)anthracene	1.7 J	1.1 J	2.9 J	2.4 J	500	150
Benzo(a)pyrene	1.1 J	1.2 J	2.2 J	2 J	100	15
Benzo(b)fluoranthene	0.94J	0.92J	2.1 J	1.6 J	50	150
Benzo(g,h,i)Perylene	0.51J	0.5 J	0.8 J	0.61J	NC	NC
Benzo(k)fluoranthene	0.9 J	0.83J	1.4 J	1.6 J	500	1500
Bis(2-ethylhexyl)phthalate	32 J	19 J	17 J	16 J	100	7800
Carbazole			2.7 J	2.4	NC	NC
Chrysene	1.9 J	1.4 J	4.2 J	3.5 J	500	150000
Di-n-octylphthalate	2.3 J	0.84J	1.3 J	0.92J	NC	NC
Fluoranthene	2.9 J	2.6 J	8.7 J	7.1 J	NC	NC
Fluorene	1.1 J	0.68J	4.8 J	3.9 J	NC	NC
Indeno(1,2,3-c,d)pyrene		0.5 J	0.58J	0.66J	NC	150
Isophorone			4.5 J		NC	NC
Naphthalene	0.74J	0.94J	1.9 J	1.6 J	NC	NC
Phenanthrene	3.6 J	2.2 J	18 J	14 J	NC	NC
Pyrene	3.3 J	2.4 J	8.7 J	6.9 J	NC	NC

All results expressed in parts per million.
Blank = Not Detected or Not Analyzed
J = Estimated Value
B = Detected in an associated blank.
NC = No Criteria
* = Duplicate of previous sample.

TABLE 4-3 (CONT'D)
SUMMARY OF ANALYTICAL RESULTS
PLATTY KILL CANAL SEDIMENT INVESTIGATION
PLATTY KILL CANAL INTERIM REMEDIAL ACTION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

ANALYTE	SAMPLING NAME / LAB ID NUMBER / SAMPLING DEPTH / SAMPLING DATE	PKCSED-11B 44171006 2.5-5 ft. 10/19/94	PKCSED-15B 44084005 4.25-8.5 ft. 10/18/94	PKCSED-16B 44084002 5-10 ft. 10/18/94	PKCSED-16C* 44084001 5-10 ft. 10/18/94	IMPACT TO GROUNDWATER CRITERIA	RISKED-BASED ALTERNATIVE CLEANUP LEVELS
INORGANICS							
Aluminium		17600 J	15800	15600	13800	NC	NC
Arsenic		25.7	19.6	62.9	51.7	NC	683
Barium		221	158	459	377	NC	583000
Beryllium		1.2 B	0.92B	1.1 B	0.93B	NC	NC
Cadmium		9.9	5.8	13	12.8	NC	NC
Calcium		7140 J	R	R	R	NC	NC
Chromium		388 J	236	460	403	NC	NC
Cobalt		14.3	10.6 B	13.2	10.5 B	NC	NC
Copper		561	311	484	432	NC	326000
Iron		44600 J	34500	38000	31800	NC	NC
Lead		444	275 J	609 J	409 J	NC	NC
Magnesium		8750 J	8040	8220	7750	NC	NC
Manganese		500	474	428	378	NC	NC
Mercury		3.1	7.1	10.1	9	NC	NC
Nickel		66.4	51.2	73.5	68	NC	NC
Potassium		R	3690 J	3600 J	3180 J	NC	NC
Silver		12.4	8.6	14.1	11.4	NC	NC
Sodium		7500	9220	9390	8940	NC	NC
Thallium			0.23J	0.3 J	0.27J	NC	NC
Vanadium		66.7 J	51.9	85.2	69.6	NC	NC
Zinc		705 J	460	740	653	NC	NC

All results expressed in parts per million.
Blank = Not Detected or Not Analyzed
J = Estimated Value
B = Detected in an associated blank.
NC = No Criteria
R = Rejected Analysis
* = Duplicate of previous sample.

TABLE 4-4
SUMMARY OF ANALYTICAL RESULTS
PLATTY KILL CANAL SEDIMENT INVESTIGATION
PLATTY KILL CANAL INTERIM REMEDIAL ACTION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

SAMPLING NAME	TPH	TOC
PKCSED-01A	100,000	160,000
PKCSED-01B	40,000	83,000
PKCSED-02A	17,000	138,000
PKCSED-02B	88,000	85,000
PKCSED-03A	150,000	154,000
PKCSED-03B	50,000	140,000
PKCSED-04A	39,000	99,300
PKCSED-04B	70,000	122,000
PKCSED-5A	5,600	70,000
PKCSED-5B	10,000	160,000
PKCSED-6A	2,100	63,400
PKCSED-6B	23,000	91,800
PKCSED-6C	21,000	120,000
PKCSED-7A	920	48,500
PKCSED-7B	9,600	83,000
PKCSED-8A	800	42,000
PKCSED-8B	960	63,200
PKCSED-9A	920	30,200
PKCSED-9B	4,800	44,600
PKCSED-10A	590	22,200
PKCSED-10B	250	32,100
PKCSED-11A	510	39,800
PKCSED-11B	380	36,400
PKCSED-12A	62	22,800
PKCSED-12B	360	41,700
PKCSED-13A	110	34,400
PKCSED-13B	2,200	38,400
PKCSED-14A	250 J	35,900
PKCSED-14B	810 J	38,700
PKCSED-15A	170 J	28,300
PKCSED-15B	310 J	30,800
PKCSED-16A	91 J	31,000
PKCSED-16B	1,700 J	47,200
PKCSED-16C	1,200 J	43,600

All results expressed in parts per million.
J = Estimated Value
TPH = Total Petroleum Hydrocarbon
TOC = Total Organic Carbon

TABLE 4-5
SUMMARY OF QUALITY ASSURANCE SAMPLE RESULTS
PLATTY KILL CANAL SEDIMENT INVESTIGATION
PLATTY KILL CANAL INTERIM REMEDIAL ACTION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

ANALYTE / SAMPLING NAME	FB-1	FB-2	FB-3	FB-4
LAB ID NUMBER	44084008	44171001	44142010	44159009
SAMPLING DATE	10/18/94	10/19/94	10/20/94	10/21/94
VOLATILE ORGANICS				
Acetone		0.026 J	0.012	
INORGANICS				
Aluminium		0.0695B	0.046 J	
Barium	0.0013B	0.0031B		0.0013B
Beryllium				0.0001B
Calcium	0.038 B	0.398 B	0.0308J	0.0308B
Copper		0.0022B		
Iron	0.057 B	0.105	0.17	0.0988B
Lead			0.0038	0.0169
Magnesium		0.119 B		
Manganese	0.0012B	0.0074B		
Sodium		0.335 B	0.18 J	0.117 B
Zinc	0.0105B	0.04	0.0107J	0.0117B

All results expressed in parts per million.
Blank = Not Detected or Not Analyzed
J = Estimated Value
B = Detected in an associated blank.

and the PAH concentrations in the sediment display a good correlation with the TPH concentrations.

Of the metals detected in the sediment arsenic, lead, and zinc were the most significant in terms of elevated concentrations. The highest lead, zinc, and arsenic in the upper sediment zone were detected in the northern most portion of the canal at sediment core location Y9-PKC-SED-01. In general, the concentrations at this location were at least one magnitude of order higher than that of the other sediment sample locations. Inside of the sheetpile dam, lead concentrations in the upper sediment zone ranged from 164 ppm to 4,700 ppm; arsenic concentrations ranged from 12.2 ppm to 324 ppm; and zinc ranged from 194 ppm to 1,010 ppm. Outside of the sheetpile dam lead concentrations ranged from 191 ppm to 222 ppm; arsenic ranged from 13.8 to 18.4 ppm; and zinc ranged from 300 to 401 ppm.

4.6.3.2 Platty Kill Canal Lower Sediment Zone

Total petroleum hydrocarbons were detected in all sixteen samples collected from the lower sediment zone, with concentrations ranging from 250 ppm (Y9-PKC-SED-10B) to 88,000 ppm (Y9-PKC-SED-02B). The TPH concentrations in the lower sediment zone have been plotted and contoured on Figure N-5. As shown on Figure N-5, the highest TPH concentrations occur at the northern wall of the Platty Kill Canal (nearest to the Exxon Lube Plant property). The isoconcentration lines depict elevated TPH concentrations which gradually decreases to 10,000 ppm immediately inside of the sheetpile dam. TPH concentrations in the lower sediment zone outside of the sheetpile dam range from 250 ppm to 4,800 ppm.

Six of the samples from the sediment cores (Y9-PKC-SED-01B, -06B, -08B, -11B, -15B, and -16B) were further analyzed for TCL volatile and semi-volatile organic compounds. BTEX compounds were detected in four of the sediment core samples (Y9-PKC-SED-01B, -06B, -08B, and -16B) with concentrations ranging from 0.044 ppm (Y9-PKC-SED-08B) to 167 ppm (Y9-PKC-SED-01B). Figure N-6 provides an isoconcentration map of BTEX concentrations in the lower sediment zone. BTEX concentrations in the sediment at this depth interval decrease immediately inside and outside the sheetpile dam. Based on the BTEX concentrations for Y9-PKC-SED-01B and Y9-PKC-SED-06B, the northern half of the canal appears to display BTEX concentrations greater than 100 ppm. The BTEX and TPH concentration distribution in the sediment displays a good correlation.

SVOC were detected in five out of the six sediment core samples collected from the lower sediment zone, with total SVOC concentrations ranging from 41.52 ppm (Y9-PKC-SED-15B) to 514.8 ppm (Y9-PKC-SED-01B). PAH compounds made up a significant portion (39% to 57%) of the SVOCs detected in samples from the lower sediment zone, with PAH

concentrations ranging from 20.68 ppm (Y9-PKC-SED-15B) to 238.9 ppm (Y9-PKC-SED-06B). The SVOC and PAH concentrations in the lower sediment zone have been plotted and contoured on Figure N-7 and Figure N-8, respectively. The highest SVOC and PAH concentrations in the lower sediment zone occur in the northern half of the Platty Kill Canal. The PAH concentration gradient decreases steeply towards the mouth of the Platty Kill Canal. The concentration distribution of SVOC and the PAH in the lower sediment zone display a good correlation with the TPH results.

Lead, zinc, and arsenic concentrations were the highest among the detected metals in the lower sediment zone. Sediment core sample Y9-PKC-SED-01B displayed the highest concentrations of lead and arsenic, at 1300 ppm and 145 ppm, respectively. The highest zinc concentration in the lower zone was detected in sediment core sample Y9-PKC-SED-08B. The concentration of metals in the lower sediment zone outside of the sheetpile dam were generally lower than those on the inside of the dam.

4.6.3.3 Comparison of the Upper and Lower Sediment Zones

The TPH concentrations of the upper and lower sediment zones were evaluated to determine the presence or absence of a vertical contamination gradient.

TPH concentrations in the upper sediment zone appear to display some "hot spots", whereas the lower sediment zone TPH concentrations are more gradational. In the northern reaches of the Platty Kill Canal, TPH concentrations in the sediment of the upper zone are higher along the western side (Y9-PKC-SED-01 and Y9-PKC-SED-03) than the eastern side (Y9-PKC-SED-02 and Y9-PKC-SED-04). In the lower zone, the TPH concentration distribution is the inverse to the upper, with the eastern side displaying higher TPH concentrations than the western side. The upper zone distribution suggests a TPH source is impacting the sediment on the western side. The lower zone distribution suggests that the eastern side contamination is attributed to an historical source.

The distribution of elevated TPH concentrations in the lower sediment zone is a really extensive; nearly three quarters of the canal displays TPH concentrations greater than 10,000 ppm. In contrast, the upper zone displays elevated TPH concentrations (greater than 10,000 ppm) in approximately one third of the canal. This occurrence is further accentuated downstream in the area outside the sheetpile dam (south). TPH concentrations displayed in the upper sediment zone, less than 100 ppm typically, are one order of magnitude lower than that of upper sediment zone, less than 1000 ppm.

The distribution of BTEX in the sediments of the upper and lower zones is similar to that of the TPH concentrations. The upper zone displays BTEX "hot spots" in the northern reaches of the canal, whereas the lower zone displays a BTEX concentration gradient that decreases to the mouth of the canal.

The distribution of SVOC in the sediments of the upper and lower zones contrasts to that of the TPH and BTEX concentrations. The upper zone displays higher concentrations of SVOC in a gradation distribution than that of the lower zone.

The distribution of metals in the sediments of the upper and lower zones do not indicate the existence of any trend or gradient.

4.6.4 NJDEP Soil Cleanup Criteria and Alternate Concentration Limits

The analytical results of the sediment sampling have been compared with the NJDEP Impact to Groundwater Soil Cleanup Criteria (NJAC 7:26D) and the proposed risk-based Alternate Concentration Limits (ACLs) that have been proposed in the Draft Platty Kill Pond Bioremediation Closure Strategy Report.

4.6.4.1 Derivation of Alternative Clean-up Criteria for the Platty Kill Pond

In order to attain the final objective of leaving the Platty Kill Pond sludge in place following completion of the ongoing bioremediation, it must be demonstrated to the NJDEP that the sludge does not present a significant risk to the surrounding environment. The NJDEP has developed interim cleanup guidelines for evaluating soil contamination. These standards specify a cleanup level of 10,000 mg/kg for TPHC, as well as specific cleanup levels for individual volatile, semivolatile, and inorganic compounds. The relative risks of the sludge were inferred by comparing the results from recent sludge and pond water sample analyses to the respective cleanup criteria. The NJDEP cleanup criteria are generic in nature and do not take into account site specific conditions. The NJDEP does allow for the establishment of site specific cleanup levels based on site conditions and the relative risk to both human health and the environment.

Based on the analytical results of sludge samples, ENSR derived alternative, risk-based cleanup levels for the Platty Kill Pond. The cleanup levels were based on the assumption that the sludge in the pond will be left in place, and the only potential for exposure would be during some kind of excavation activity such as repair or maintenance of underground pipeline, sewers or utility lines. It also assumed that there will be no potential exposure via the groundwater route because groundwater in the Bayonne area is not used as a drinking water

source, and that there is no potential exposure to residential populations due to the ponds location on the site, and because access to the site is controlled

The risk-based cleanup levels were calculated in accordance with current U.S. EPA guidance, including Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual (U.S. EPA, 1992a) and Guidance on Risk Characterization for Risk Managers and Risk Assessors (U.S. EPA, 1992a). The cleanup levels were based on the standard four-step paradigm determined by the National Research Council (NRC, 1983):

- Hazard Identification;
- Toxicity Assessment;
- Exposure Assessment; and
- Risk Characterization.

The risk-based cleanup levels are presented in Table 4-6. Appendix O provides the documentation of the derivation of the risk-based cleanup levels.

4.6.4.2 Comparison of Results to Clean-up Criteria

The NJDEP Soil Cleanup Criteria for TPH is 10,000 ppm (including all volatile organics). In the upper sediment zone, four out of sixteen sediment samples collected exhibited TPH concentrations above 10,000 ppm, these included samples Y9-PKC-SED-01A, -02A, -03A, and -04A. These are all located in the northern portion of the canal, between the earthen dam at the Platty Kill Pond and the bridge spanning the canal. In the lower sediment zone, six out of the sixteen sediment samples collected exhibited TPH concentrations above 10,000 ppm, these include samples Y9-PKC-SED-01B, -02B, -03B, -04B, -05B, and -06B. These are all located in the northern reaches of the canal, from the earthen dam to a point approximately midway between the bridge that spans the canal and the sheetpile dam at the mouth of the canal. All sediment samples collected from outside the sheetpile dam, both in the upper and lower sediment zones, exhibited TPH concentrations below 4,500 ppm.

Selected sediment cores were submitted for volatile and semi-volatile organic and metals analysis. Two sediment cores (Y9-PKC-SED-01, Y9-PKC-SED-06) displayed volatile organic concentrations which exceeded the NJDEP Soil Cleanup Criteria for benzene (1 ppm), xylenes (10 ppm) and chlorobenzene (1 ppm). All volatile organic concentrations were within one order of magnitude or less of the NJDEP Soil Cleanup Criteria. However, the proposed ACL for benzene (2,820 ppm) was not exceeded by the concentrations observed in these sediment cores. For semi-volatile organic compounds, no sediment concentrations were above the NJDEP Criteria or the proposed ACLs. Concerning the metal detections within the sediment

Table 4-6
Risk-Based Alternative Cleanup Levels
Platty Kill Pond Bioremediation
Bayonne Industries, Inc.
Bayonne New Jersey

Compound	Based on Health Index of 1	Based on Cancer Risk of $1x10^{-6}$
Benezene	NC	2.82E+03
1,2-Dichloroethane	NC	1.07E+03
Benzo(a)Anthracene	2.34E+05	1.50E+02
Bis(2-Ethylhexyl)Phthalate	1.56E+05	7.80E+03
Chrysene	2.34E+05	1.50E+04
Indeno(1,2,3-cd)Pyrene	2.34E+05	1.50E+02
Benzo(b)Fluoranthene	3.13E+05	1.50E+02
Benzo(k)Fluoranthene	2,34E+05	1.50E+03
Benzo(a)Pyrene	2.34E+05	1.50E+01
Barium	5.83E+05	NC
Arsenic	2.56E+03	6.83E+02
Copper	3.26E+05	NC

Notes: NC - not calculated because no dose-responce value was available

Noncarcinogenic cleanup levels based on a health index of 1 and Carcinogenic cleanup levels based on a cancer risk of $1x10^{-6}$ were calculated for each compound. The lower of these two values were used to compare with existing site concentrations.

cores, no criteria values have been developed by the NJDEP. All metal concentrations were below the proposed ACLS for arsenic, barium and copper.

4.7 Performance of Pneumatic Barrier

The pneumatic barrier has proven to be an effective containment barrier to the escape of petroleum sheens and/or any floating trash into the Kill Van Kull. It has also had a positive effect on the general water quality in the vicinity of the Platty Kill Canal mouth.

In general, low turbidity and high secchi disk readings indicated very good water clarity for an estuary, particularly New York harbor waters, and chemical/physical data indicated the water column was well mixed with no well defined salinity or temperature gradient.

As would be expected with the operation of a pneumatic barrier, dissolved oxygen levels were highest close to the barrier and decreased with distance from the barrier. Dissolved oxygen results from samples collected from the control site across the Kill Van Kull were a full 1 mg/L below that found in the near field of the pneumatic barrier. Dissolved oxygen results from the other two control sites were slightly less than those at the barrier.

Biological samples collected using the bottom trawl at the test site and control sites, indicated the largest concentration of fish to be at the test site in close proximity to the pneumatic barrier. Biological samples collected using the gill nets also indicated an obvious preference for the nearfield zone of the pneumatic barrier, and indicated that these fish were most likely feeding in the currents created by the barrier.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Bulkhead Reconstruction and Pneumatic Barrier

The reconstruction of the Platty Kill Canal bulkhead has attenuated the seepage of free-phase product from the canal. Based on the absence of product seepage since the reconstruction, no further reconstruction activity is warranted at this time. To reduce the potential for further free-phase product to emanate from the canal, Bayonne Industries has completed the installation of the subaqueous air dam at the mouth of the canal. This technology is unique because it permits the natural wave and tidal action to pass the air dam while providing a surface barrier for migrating free-phase product.

5.2 Product Curtain

As a result of the installation of the product curtain and the adjacent recovery wells, the free-phase product is being attenuated and product recovery has been initiated. No further modification to this structure is warranted at this time.

5.3 Product Recovery Program

Based on the results of the interim remedial activities, ENSR/Bayonne Industries plans to upgrade the interim product recovery program. The program upgrade is expected to be initiated in January 1996 and will consist of the installation of two active skimming pumps into recovery wells Y2-PKB-RW-1 and Y2-PKB-RW-2 to continuously recover free-phase product from along the product curtain. Passive Skimmers will continue to be utilized at monitoring wells MW-4, MW-5, and MW-20.

The active skimming pumps in Y2-PKB-RW-1 and Y2-PKB-RW-2 would be cycled by a timer-control panel and the free-phase product would be discharged to an above-ground holding tank with automatic shut-off controls. Recovered fluids in the holding tank would be periodically removed and disposed of at an approved facility.

Product accumulation tank measurements recorded by an ENSR technician will be closely monitored. Once the fluid level in the tank has achieved approximately 95% of the storage capacity, the fluids will be removed from the holding tank by a vacuum truck, and properly disposed of, or with NJDEP approval, be blended with existing petroleum product stock.

Future documentation associated with free-phase product recovery will be prepared for submission to the NJDEP on a quarterly basis. The report will include graphs of weekly and cumulative product recovery efforts and serve to document the product recovery progress.

5.4 PKC Sediment

Based on both physical boundaries and analytical results, the Platty Kill Canal can be partitioned into three separate areas. The first area is the northern section that includes the area from the earthen dam at the Platty Kill Pond, south to the bridge that spans the canal. The second area is the mid-section that includes the area from the bridge, south to the sheetpile dam at the mouth of the canal. The third area includes the section outside of the sheetpile dam.

Analytical results from samples collected from outside the sheetpile dam indicate that the TPH concentrations in the upper sediment zone (0 to 4 foot depth interval) are below 1,000 ppm; and the TPH concentrations in the lower sediment zone (below 4 feet) are less than 2,500 ppm. These TPH concentrations are below the NJDEP 10,000 ppm total organic compound including TPH soil cleanup criteria. Analytical results from sediment samples collected from outside of the sheetpile dam and analyzed for TCL volatile and semivolatile organic compounds, and TAL metals indicate that all compounds detected are below their respective NJDEP impact to groundwater, soil clean-up criteria and below the risk-based alternative clean-up levels developed for the Platty Kill Pond. Based on these results Bayonne Industries proposes, **No Further Remedial Actions for the sediments outside of the sheetpile dam.**

Analytical results of sediment samples collected from the mid-section of the canal indicate that the TPH concentrations in the upper zone are at, or slightly above the 10,000 ppm clean-up criteria; and TPH concentrations in the lower zone exceed the 10,000 ppm criteria in the upper reaches of this section near the bridge. Individual organic compound and metals contaminant concentrations in sediment samples collected from this area, in both the upper and lower sediment zones are below their respective clean-up criteria (for those that have established criteria) and below the ACLs developed for the Platty Kill Pond. International Matex Tank Terminals, the current site operator, has a need to dredge their shipping berths. Since ocean dumping of these dredge spoils is currently banned, IMTT has been exploring potential upland disposal areas for these dredge spoils; therefore, Bayonne Industries proposes to use the mid-section of the Platty Kill Canal as a dredge spoils disposal area. Impervious barriers will be constructed at each end of the section, and the area will be de-watered as the dredge spoils are placed into the canal section. Once filled, the dredge spoils will be capped and the area will be seeded.

Analytical results from samples collected from the northern section of the canal indicate that the TPH concentrations in both the upper and lower sediment zones exceed the 10,000 ppm clean-up criteria as well as the 35,000 ppm NJDEP hazardous waste criteria. Analytical results of sediment samples collected from this section of the canal indicate contaminant concentrations similar to those presently in the Platty Kill Pond. To reduce the TPH and organic compound concentrations in the sediments in the northern section of the canal to below regulatory limits, Bayonne Industries proposes to install and operate a bioremediation system similar to the one currently in use in the Platty Kill Pond. New sheetpile bulkheads will be installed on the sides of the canal and an impermeable barrier will be constructed at the bridge that spans the canal, to prevent the migration of contaminants to the mid-section of the canal.

A Remedial Action Work Plan for the bioremediation of the northern section of the canal and the use of the mid-section of the canal as a dredge spoils disposal area, will be prepared and submitted to NJDEP as a separate document from this IRA Report.

To: CKANAKIS, JKARPA
From: MTURNER
Subject: Bayonne Industries IEC
Date: 08-17-95 Time: 5:41p

Mary Hrenda and I were at the Bayonne Ind site today (Thurs 8/17) and identified a Toxic or Harmful Gas Exposure IEC. A volatile product is entering a storm sewer line and is creating a toxic gas which has been recorded on confined space permits as high as 90% of the LEL. In addition, Mike Koscelnak of Bay. Ind. said numerous reading were as high as 200% of the LEL. Readings today were only at 2% LEL but intermittent high reading have been occuring for the last couple of months. The product is also migrating into the Kill Van Kull and a sheen is present for 600-800 ft along the shoreline. Bay Ind has failed to identify the extent of the problem to the Dept, but, have taken measures to contain and remediate the product.

I have requested that they put together a plan to delineate the product and ID the source if possible. They also plan to begin active recovery at one well which has 4.75 feet of product. All impacted wells are now being vac trucked 2x per day. This effort will be handled as an IRA outside the scope of the ongoing RI. I have requested that they submit a action plan next week and May Hrenda is contacting them tomorrow with specific dates. In the interim, access to the site and the storm sewer line is restricted and monitored by Bay Ind Safety Personnel. They ensure that the line is vented and that noone enters the line until readings are below 10% of the LEL. DOT who has responsibility for the storm line discharge has a diver entering the line on a regular basis to inspect and eliminate product infiltration. The entire water front is boomed and monitored around the clock to ensure that product does not migrate into the open water. Because I am out tomorrow, Mary Hrenda will also contact the health officer for the region to alert them to the situation.

We should met to discuss this further on Monday. Let me know what you think.

cc: JBOYER, MHRENDA

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY

CHRISTINE TODD WHITMAN
Governor

ROBERT C. SHINN, JR.
Commissioner

MEMORANDUM

AUG 15 1994

TO: MATTHEW TURNER, CASE MANAGER, BSCM

FROM: JOHN E. BOYER, TECHNICAL COORDINATOR, BEERA/EES

SUBJECT: REVIEW OF **FINAL REMEDIAL INVESTIGATION WORKPLAN**
(DATED JUNE 1994)
BAYONNE INDUSTRIES, INC. (IMTT)
CITY OF BAYONNE, HUDSON COUNTY

DATE: 15 AUGUST 1994

As requested in your referral of 14 July 1994, a technical review has been completed on the aforementioned document prepared by ENSR Consulting and Engineering for the Bayonne Industries (BI) site. This workplan has been revised to reflect previous technical comments on the Provisional Groundwater Remedial Investigation Workplan (J. Boyer to M. Turner, dated 17 November 1992), the initial site-wide draft RIWP (J. Boyer to M. Turner, dated 18 June 1992), and the revised August 1993 RIWP (J. Boyer to M. Turner, dated 13 December 1993). This review reflects the minimum provisions of the *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E). Finally, two outstanding issues not addressed by ENSR in the revised document are enumerated in the comments presented below.

The document is acceptable to BEERA, pending incorporation of the technical modifications and supplementation of the outstanding issues as discussed below.

Site Background

Bayonne Industries, Inc. is a warehousing operation of liquid bulk storage and petroleum products. The 200 acre site is located in the Constable Hook area of Bayonne, Hudson County, between the Exxon Bayonne Terminal, the Kill Van Kull and East 22nd Street. Historically, the site was operated by the Tidewater Oil Company as a coal terminal, refinery and petroleum liquid terminal from 1870 until 1949. Previous investigations have discovered NAPLs and chromium slag on-site. The Department and Bayonne Industries entered into a Memorandum of Agreement (MOA) on 27 May 1992.

Comments

1. Baseline Ecological Evaluation, Section 1.2

During the review of the Provisional Groundwater RIWP and during subsequent technical meetings, the necessity to conduct an Ecological Evaluation was reported to IMTT. The response, as contained in the first draft RIWP, was that these requirements are met by IMTT's completion of its Discharge Prevention, Containment, and Countermeasure (DPCC) Plan and the incorporated Discharge Cleanup and Removal (DCR) Plan, pursuant to the New Jersey 1990 Spill Compensation and Control Act (N.J.A.C. 7:1E-1.1 et seq.). This was deemed unacceptable by the Department for several reasons. First, these documents were not submitted to the Case Manager in support of IMTT's contention. Second, it was unclear whether all the provisions of an ecological evaluation were contained in these plans.

To resolve this issue, IMTT has agreed to extract and summarize the relevant points from these plans that address the provisions of the ecological evaluation and report them to the Department as part of the subsequent RI Report.

For IMTT's information, the Department just recently evaluated a similar request from the Exxon Linden Technology Center site. The Environmentally Sensitive Areas Protection Plan (ESAPP), as contained in Exxon's DCR Plan, was reviewed and determined not to meet the scope or the organization required for a ecological evaluation. While it contained information that will greatly assist in developing an acceptable ecological evaluation, the ESAPP was found to be an inadequate substitute. In summary, the ESAPP discussed potential **future** risks to environmentally sensitive areas, but did not address impacts from **past** discharges nor compare past sampling results in the various media to current standards and criteria.

It is recommended that IMTT not extract and summarize the relevant points from their ESAPP as part of the RI Report. These provisions alone are not likely to meet the requirements for an ecological evaluation. IMTT can still proceed with a variance request under provisions of the *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E-1.6). BEERA's position on the level of effort necessary for the ecological evaluation has been expanded from earlier memoranda to include more details as to the adequacy of the investigation.

To reiterate, the contractor will characterize the nature and extent of environmental impacts at this site. This ecological evaluation must be consistent with *The Risk Assessment Guidance for*

Superfund, Volume II, Environmental Evaluation Manual (EPA/540/1-89/001). Additional references that should be utilized include: *Ecological Assessments of Hazardous Waste Sites: A Field and Laboratory Reference Document* (EPA/600/3-89/013) and *CERCLA Compliance With Other Laws Manual* (EPA/540/6-89/006). It is highly recommended that IMTT/ENSR discuss the scope of work with the NJDEP technical staff.

Specifically, the ecological evaluation shall:

(a) Identify the ecosystems and habitats that are and may be impacted by contamination and remediation, both on and adjacent to the site. An effort must be made to define the boundaries of these ecosystems.

(b) Document the significance, uniqueness, or protected status of potentially exposed ecosystems and populations. Examples include impacted wetlands, endangered and threatened species as well as their habitats.

(c) Specify which contaminants at the site are of particular concern from an ecological perspective. This list must be developed independently from any human health risk assessment list and be based on factors such as bioaccumulation or exceedances of EPA/NJDEP guidance.

(d) Define the source areas of contamination and the potential pathways of contaminant migration off site.

(e) Investigate exposure pathways to potential ecological receptors.
- characterize exposure to the contaminants both temporally and spatially;
- characterize the site specific geophysical, biological, and chemical conditions affecting exposure.

(f) Identify particular data gaps and provide specific recommendations for additional ecological investigations (i.e., biological sampling, toxicity testing) during a future environmental assessment (if required).

In addition, ENSR must be prepared to assess the potential impacts of continued contaminant release under a no-action scenario and the ecological effects of a proposed remedial alternative (as part of a Remedial Alternative Analysis/Feasibility Study).

2. Platty Kill Discharge Pipe

As reported in the NJDEP Geologist's memorandum (M. Hrenda to M. Turner, dated August 1994), a large diameter pipe has been previously noted apparently discharging petroleum-tainted liquid into the Platty Kill Creek. BEERA concurs that the historic origin of this pipe and its potential to contaminate the surface water and/or other matrices at and adjacent to the BI site must be investigated as part of the Platty Kill Creek IRM.

State of New Jersey
Department of Environmental Protection

Christine Todd Whitman
Governor

Robert C. Shinn, Jr.
Commissioner

MEMORANDUM

TO: MIKE KENNEY, CASE MANAGER, BSCM

FROM: JOHN E. BOYER, TECHNICAL COORDINATOR, BEERA/EES

SUBJECT: REVIEW OF **PLATTY KILL CANAL PHASE II SEDIMENT INVESTIGATION REPORT** (DATED 25 MARCH 1998)
BAYONNE INDUSTRIES, INC. SITE
BAYONNE, HUDSON COUNTY
JC: J010N4A0 AC: V65H

DATE: 23 APRIL 1998

As requested in your referral of 26 March 1998, a technical review has been completed on the aforementioned document prepared by Bayonne Industries for the Bayonne Industries site. The Platty Kill Canal (PKC) Phase II Sediment Investigation Report discusses the supplemental sediment results obtained from the June 1996 sampling event. Prior technical reviews (J. Boyer to M. Kenney, dated 4 January 1996 & 9 April 1996) were examined in preparation of this memorandum.

The document is acceptable to BEERA, pending incorporation of the technical modifications and supplementation of the outstanding issues as discussed below.

Site Background

Bayonne Industries, Inc. is a warehousing operation of liquid bulk storage and petroleum products. The 200-acre site is located in the Constable Hook area of Bayonne, Hudson County, between the Exxon Bayonne Terminal, the Kill Van Kull and East 22nd Street. Historically, the site was operated by the Tidewater Oil Company as a coal terminal, refinery and petroleum liquid terminal from 1870 until 1949. Previous investigations have discovered NAPLs and chromium slag on-site. The Department and Bayonne Industries entered into a Memorandum of Agreement (MOA) on 27 May 1992.

Comments

A series of sediment samples were collected from Platty Kill Canal (PKC) at varying depths and analyzed for total petroleum hydrocarbons (TPH) and TCL/TAL parameters. The results confirm the conclusions reached in the Phase I PKC sediment investigation report. Elevated TPH, volatile and semi-volatile organic contaminants exist throughout the canal down to a depth of approximately 20 feet. The highest contaminants are found in the northern and central portions of the canal. Low or acceptable concentrations are found in the southern portion of the canal and downstream of the sheetpile dam.

Bayonne Industries (BI) has recommended no further investigatory work for the PKC sediments. BEERA agrees that BI has properly characterized the sediments within the PKC. Additional delineation may be required during the pre-design phase depending on the remedial action selected.

It should be noted that the data packages were not internally validated. Due to the high contaminant levels in the samples, any modifications due to quality control problems would not change the basic conclusions. Therefore, the data packages were not sent to QAS for validation.

Please feel free to contact me should you have any questions. I can be reached at ☎ (609) 984-9751 or 🖳 jboyer@dep.state.nj.us. Thank you.

JEB
My documents\word97\bayonne industries\pkc sed2 rpt.398.doc\4.23.98

cc: Kevin Schick, Section Chief, BEERA/EES
Mary Hrenda, Geologist, BGWPA

State of New Jersey
Department of Environmental Protection and Energy
Division of Responsible Party Site Remediation
CN 028
Trenton, NJ 08625-0028
Tel. # 609-633-1408
Fax. # 609-633-1454

Scott A. Weiner
Commissioner

Karl J. Delaney
Director

IN THE MATTER OF THE	:	
BAYONNE INDUSTRIES SITE	:	MEMORANDUM
AND	:	OF
BAYONNE INDUSTRIES, INC.	:	AGREEMENT

This Memorandum of Agreement is issued pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection and Energy (hereinafter "the Department" or "NJDEPE") by N.J.S.A. 13:1D-1 et seq. and the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq. and the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. and duly delegated to the Assistant Director, Division of Responsible Party Site Remediation pursuant to N.J.S.A. 13:1B-4.

FINDINGS

1. The property that is the subject of this memorandum of agreement is owned by Bayonne Industries, Inc., and is located at the Foot of East 22nd Street and is designated as Block 381, Lot 1 on the tax maps of Bayonne City, Hudson County, New Jersey (hereinafter the "Site"). The Site encompasses approximately 200 acres and is bounded generally by Exxon Corporation's Bayonne Terminal to the east, the Kill Van Kull to the south a railroad easement and waterway to the west and East 22nd Street to the north.

2. Bayonne Industries, Inc. (hereinafter "Bayonne"), a New Jersey Corporation with its' principal offices located at 321 St. Charles Street, New Orleans, Louisiana, is the party executing this memorandum of agreement.

3. The intent of this memorandum of agreement is to allow Bayonne to conduct any of the remedial activities outlined herein with oversight from the Department. Bayonne has indicated to the Department in its application dated March 18, 1992, that it wishes to conduct the following activities at the Site with the Department's oversight:

- Remedial Investigation Work Plan
- Remedial Investigation Report
- Feasibility Study Work Plan
- Feasibility Study Report
- Remedial Design Work Plan
- Remedial Design Report

4. By entering into this memorandum of agreement, Bayonne does not admit to any fact, fault or liability under any statute or regulation for conditions

which existed before, during, or after Bayonne's execution of this memorandum of agreement.

AGREEMENT

I. Remediation

1. Bayonne agrees to submit a Remedial Investigation Work Plan, Remedial Investigation Report, Feasibility Study Work Plan, Feasibility Study Report, Remedial Design Work Plan and Remedial Design Report and the Department agrees to review and comment on documents submitted. Bayonne agrees to prepare these documents, and implement the activities stipulated therein, in accordance with the Department's prevailing technical standards

2. Within thirty (30) calendar days after the Department's receipt of any submission pursuant to this memorandum of agreement, the Department will inform Bayonne in writing of any administrative deficiencies in the submission that will prevent the Department from conducting its review. When the Department determines that the submission is administratively complete, the Department will notify Bayonne in writing of the timeframe required for the Department to complete the review.

3. Within seven (7) days after the effective date of this memorandum of agreement, Bayonne will submit to the Department: a) the name, address and telephone number of the individual who will be the contact for Bayonne regarding technical matters concerning this memorandum of agreement and b) the name and address of the designated agent for Bayonne for the purpose of service for all matters concerning this memorandum of agreement.

4. Bayonne may terminate this memorandum of agreement, if it is determined that it is no longer feasible or desirable to continue with the activities agreed upon herein, when Bayonne:

a. Submits full payment to the Department for any Department oversight costs incurred pursuant to this memorandum of agreement which Bayonne has not paid;

b. Notifies the Department in writing of its intentions to terminate this memorandum of agreement;

c. Submits to the Department all data generated pursuant to this memorandum of agreement; and

d. Ensures that no environmental hazards exist at the Site as a result of Bayonne's actions pursuant to this memorandum of agreement.

II. Project Coordination

1. Unless otherwise directed by the Department, Bayonne shall submit four (4) copies of all documents required by this memorandum of agreement to the person identified below, who shall be the Department's contact for Bayonne for all matters concerning this memorandum of agreement.

New Jersey Department of Environmental Protection and Energy
Division of Responsible Party Site Remediation
Bureau of State Case Management
401 East State Street CN 028
Trenton, New Jersey 08625
Attn: David Sweeney, Section Chief

III. Financial Obligations

1. Upon receipt of a summary of the Department's costs incurred in connection with its oversight functions of this memorandum of agreement, including the Department's prior costs in the amount of $9,209.25, which figure does not include the costs incurred from April 18, 1992 to the execution date of this memorandum of agreement, Bayonne shall submit to the Department a cashier's or certified check payable to the "Treasurer, State of New Jersey" with NJDEPE Form 062A for the full amount of the Department's oversight costs. Bayonne cannot be released from its obligations under this memorandum of agreement, until all oversight costs, for work performed by the Department, are paid.

2. Beginning three hundred sixty-five (365) calendar days after the effective date of this memorandum of agreement, and annually thereafter on that same calendar day, Bayonne shall submit to the Department a detailed summary of all monies spent to date pursuant to this memorandum of agreement, the estimated cost of all future expenditures required to comply with this memorandum of agreement (including any operation and maintenance costs), and the reason for any changes from the previous cost review Bayonne submitted.

IV. Reservation of Rights

1. The Department reserves the right to unilaterally terminate this memorandum of agreement in the event that Bayonne violates any terms or fails to meet the obligations of this memorandum of agreement or for any other reason set forth by the Department.

2. Nothing herein, including any document the Department issues as agreed to above, shall be interpreted to constitute a release or waiver of liability for any of the conditions which existed before, during or after the Department's execution of this memorandum of agreement.

V. General Conditions

1. Bayonne shall, in addition to any other obligation required by law, notify the Department contact immediately upon knowledge of any condition posing an immediate threat to human health and/or the environment.

2. Bayonne shall perform all work conducted pursuant to this memorandum of agreement in accordance with prevailing professional standards.

3. Bayonne shall conform all actions required by this memorandum of agreement with all applicable federal, State and local laws and regulations.

4. Nothing in this memorandum of agreement shall relieve Bayonne from complying with all other applicable laws and regulations.

5. Bayonne shall preserve all potential evidentiary documentation found at the Site, including without limitation, documents, labels, drums, bottles, boxes or other containers, and/or other physical materials that could lead to the establishment of the identity of any person which generated, treated, transported, stored or disposed of contaminants at the Site, until written approval is received from the Department to do otherwise.

6. Upon receipt of a written request from the Department, Bayonne shall submit to the Department all data and information concerning contamination at the Site, including technical records and contractual documents, and raw sampling and monitoring data, whether or not such data and information was developed pursuant to this memorandum of agreement.

7. This memorandum of agreement shall be governed and interpreted under the laws of the State of New Jersey.

8. This memorandum of agreement shall be binding, jointly and severally, on each signatory, its successors and assignees. No change in the ownership or corporate or business status of any signatory, or of the facility or Site shall alter any signatory's responsibilities under this memorandum of agreement.

9. This memorandum of agreement shall become effective upon execution hereof by all parties.

Date: 5-27-92

DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY

BY: /S/
Signature

RONALD T. CORCORY
Print Full Name Signed Above

ASSISTANT DIRECTOR
Title

Date: 5/19/92

BAYONNE INDUSTRIES, INC.

BY: R. Courtney
Signature

RICHARD D. COURTNEY
Print Full Name Signed Above

SENIOR VICE PRESIDENT, TREASURER
Title

IMTT-Bayonne
A PARTNERSHIP
Bayonne Terminal: Foot of East 22nd Street, P.O. Box 67, Bayonne, N.J. 07002 (USA)
Phone: (201) 437-2200 • Fax: (201) 339-4993

M Kearney

February 6, 2003

FEB 1 1

Assistant Director of Water and Hazardous Waste Enforcement
Division of Enforcement Field Operations
NJDEP
401 East State Street
CN 422
Trenton, NJ 08625

RE: NJPDES Permit No.: NJ0002089
NJDEP Hotline Case Number: 03-01-14-131823

Dear Sir,

This report is being filed in accordance with section NJAC 7; 14A-6.10 for the discharge of storm water through an outfall not covered under NJPDES Permit Number NJ0002089. This incident was communicated to the NJDEP Hotline and assigned the above Case Number by Operator 4.

Site specific information related to this incident is as follows:

Site Location: IMTT-Bayonne
250 EAST 22nd STREET
BAYONNE, NJ 07002

Property Owner: Bayonne Industries
321 Saint Charles Ave
New Orleans, La. 70130

1) DESCRIPTION OF DISCHARGE:
On January 14, 2003 at approximately 11:30 AM storm water was observed discharging through an overflow pipe from the Platty Kill Pond to the Platty Kill Canal. As described herein, the high level in the Platty Kill Pond is believed to be due to a faulty plug in a storm sewer line which allowed storm water to be diverted from the wastewater treatment plant to the Platty Kill Pond.

Historical Background of the Platty Kill Pond

The Platty Kill Pond served as a storm and wastewater detention basin for the terminal from approximately 1900 to 1970. In the early 1970s, all sewers entering the Platty Kill Pond were redirected to the wastewater treatment plant. The Platty Kill Pond is currently in the process of being closed in accordance with the New Jersey Technical Requirements for Site Remediation. As part of the closure plan for the Platty Kill Pond all sewers entering the Platty Kill Pond that could not be field verified as being previously sealed were identified and filled with concrete. This work was completed in 2000.

2) STEPS TO DETERMINE CAUSE OF NONCOMPLIANCE
All pipes penetrating the Platty Kill Pond bulkhead were examined from the perimeter upon discovery of the storm water discharge. The examination indicated storm water was flowing into the Platty Kill Pond through a 36-inch diameter sewer pipe. This additional storm water raised the level in the Platty Kill Pond and created the overflow condition. A review of historical drawings indicated that the 36-inch diameter sewer pipe was previously severed, **sealed** and the sewer redirected to the wastewater treatment plant. A dye study initiated on January 15, 2003 confirmed the visual examination of the previous day, which indicated that the 36-inch diameter pipe was discharging storm water into the Platty Kill Pond. The source of the storm water was identified and a work plan developed to reseal the 36-inch diameter sewer pipe.

3) STEPS TO REDUCE, REMEDIATE, AND ELIMINATE DISCHARGE, TIME FRAME.
The storm water discharge from the overflow pipe was observed at 11:30 AM. The overflow pipe in the Platty Kill Pond was raised above the water level and the discharge was stopped by 2:30 PM. The overflow pipe was raised above the high water mark in the Platty Kill Pond and therefore will not pose a risk to discharge additional storm water.

As a temporary measure, a plumber's plug was installed in the 36-inch diameter pipe to stop storm water from entering the Platty Kill Pond. Currently, the sewers are being monitored to determine any effects and if none are observed, the 36-inch diameter sewer pipe will be plugged with concrete. At this time, based on preliminary observations, it appears storm water is flowing in the proper direction to the wastewater treatment plant.

The situation will be monitored and additional investigations conducted, and work plans developed as conditions warrant.

4) DURATION OF DISCHARGE, RETURN TO COMPLIANCE
The discharge was discovered on January 14, 2003 at 11:30 AM and stopped at 2:30 PM.

5) THE CAUSE OF THE NONCOMPLIANCE
Storm water entered the Platty Kill Pond through a 36 inch diameter sewer pipe that was shown on historic drawing as being severed and plugged. The plug was verified from grade. An excavation of the area was performed and the point at which the sewer was severed was also verified from grade. It could not be determined how storm water was entering the 36-inch diameter pipe after two days of field excavation.

The elevation of the over flow pipe was unintentionally lowered as a result of various field investigations conducted at the Platty Kill Pond. These field investigations were conducted in association with preparations closing of the Platty Kill Pond. Storm water entering the Platty Kill Pond via the 36-inch sewer pipe increased the level in the Platty Kill Pond thereby causing the water level to rise.

6) STEPS BEING TAKEN TO REDUCE, ELIMINATE AND PREVENT NONCOMPLIANCE
The overflow pipe was raised above the Platty Kill Pond water level and the 36-inch sewer pipe plugged.

7) ESTIMATE THREAT TO HUMAN HEALTH AND ENVIRONMENT

A grab sample was collected of the storm water discharging through the overflow pipe into the Platty Kill Canal. The sample results indicate a low concentration of contaminates and therefore this event did not impact the environment. The storm water was analyzed for Volatile compounds, (EPA Method 624), Acid Base Neutral compounds (EPA Method 625), metals, COD, TSS and Petroleum Hydrocarbons. The following table is a comparison of compounds detected in the storm water discharge to the Effluent Standards for New Sources, New Discharges or Expanded Direct Discharges contained in NJAC 7:14A-12 Appendix C for receiving streams with a SE classification. The receiving stream for this discharge is the Kill Van Kull, which has a stream classification of SE-3. The complete analysis is attached.

Parameter	Storm Water Sample, ppb	NJAC 7:14 A-12,App.C Effluent Standard, ppb
Benzene	1.7	136
Chlorobenzene	1.1	28
1,2-Dichloroethane	0.44	211
cis-1,2Dichloroethene	1.8	NS
Ethylbenzene	0.49	108
Toluene	2.2	80
Trichloroethene	0.60	NS
Xylenes	1.7	NS
Lead	3.1	69.5
Nickel	43.3	67.9
COD	180 ppm	NS
Pet. Hydrocarbons	< 0.51 ppm	NS
TSS	6.0 ppm	NS

NS: No Standard listed

8) REMEDIATION AND PREVENTION

See item 6.

Please contact Mr. George M. Bress should you require additional information regarding this matter.

Sincerely Yours,

Richard R. Fisette

CC: Mr. M. Kenney, NJDEP
Mr. R. Walker
Mr. M. Morganti
Mr. G. M. Bress

State of New Jersey
Department of Environmental Protection

James E. McGreevey
Governor

Bradley M. Campbell
Commissioner

Bureau of Case Management
P.O. Box 028
401 East State Street
Trenton, NJ 08625-0028
Telephone: (609) 633-1455
Facsimile: (609) 633-1439

Rusty Walker
Director of Environment, Health & Safety
International Matex Tank Terminals
321 St. Charles Street
New Orleans, LA 70130

MAR 14 2003

Dear Mr. Walker:

Re: In the Matter of the Bayonne Industries Site, Cogen Technologies, and Bayonne Industries, Inc.
City of Bayonne, Hudson County, New Jersey
Contaminated Site List No. NJD064288855
Memorandum of Agreement (MOA) dated 27 May 1992
Remediation Agreement (RA) dated 22 January 1999 - ISRA Case # 98513
Platty Kill Canal (PKC) - Remedial Investigation Report (RIR) Addendum dated 28 August 2001 &
Technical Modification to Hot Spot Delineation dated 26 September 2001

The New Jersey Department of Environmental Protection (Department or NJDEP) has completed its review of the referenced documents and determined that they are conditionally acceptable. Prior to enumerating the conditions that shall apply to the Department's approval of these documents, the NJDEP reiterates that Bayonne Industries, Inc. (BI) and ExxonMobil (EM) are jointly and severally responsible for the contamination in the PKC, which lies on the border of both properties. BI and EM have agreed to conduct the PKC remediation in a cooperative manner with NJDEP oversight being primarily directed to BI. As part of the proposed PKC remedial action, sediment contaminated with high concentrations of polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and inorganic analytes will be excavated. Originally, BI and EM proposed to place the excavated sediment into the adjacent Platty Kill Pond (PKP) and stabilize the material as part of the remedial action for PKP. However, BI recently informed the NJDEP that the contaminated "hot spot" sediment from the PKC would not be placed into the PKP. Therefore, an acceptable treatment or disposal method shall be selected/proposed for the contaminated "hot spot" sediment that shall still be excavated from the PKC.

Remedial Investigation Report (RIR) Addendum

Based upon its review, the Department has determined that the data do not fully support the conclusions presented in the RIR Addendum. However, the NJDEP recognizes that the conclusions are preliminary and that further investigation is proposed. Therefore, the RIR Addendum is conditionally acceptable for pre-design investigative purposes provided that the following comments are addressed to Department's satisfaction. Since the selected remedy relies largely on containment of the contamination present in the PKC sediment, the comments pertain mainly to the presence, integrity, thickness, and/or continuity of the clay layer that is intended to serve as the bottom/floor of the containment system.

CCA000036

3. **Thickness of Confining Unit**

Determining the thickness and permeability of the clay beneath the PKC is a critical component of the selected remedy. The ability to implement a containment strategy will be compromised by the absence of a continuous layer of a thick, impermeable confining unit beneath the PKC. Based on available information, the NJDEP's requirements and the recommendations of the sheet pile engineer (see next paragraph) may not be met.

As stated in the 3 January 2001 letter from Dr. Weaver, the sheet pile engineer recommended that a clay thickness of 5 feet would be needed to provide an adequate seal around the sheet pile and maintain an adequate thickness of clay below the sheet pile. In addition, the RIR Addendum concludes that the results of field observations and the laboratory permeability analyses have demonstrated that the clay and clay-till together would form an impermeable barrier that would be effective in retarding the vertical migration of contaminants. The recommendation provided by the sheet pile engineer seems reasonable, but the NJDEP does not concur with the cited conclusion.

Review of the logs for the "land-side" borings (Appendix A) indicate that clay thickness ranges from 0.0 feet (DSB-11) to 8.5 feet (DSB-9). Less than 5 feet of clay was encountered in borings DSB-1 (0.5 ft), DSB-2 (1 ft), DSB-4 (1.5 ft), DSB-7 (3 ft), DSB-8 (4 ft), DSB-10 (2 ft) and DSB-11 (0.0 ft). All of the laboratory permeability tests that yielded data in the 10^{-7} cm/sec range were performed on samples from intervals logged as clay in land-side borings and Vibrocore borings. However, the permeability tests performed on the till yielded data in the 10^{-3} to 10^{-6} cm/sec ranges. A permeability of $1x10^{-7}$ cm/sec is considered impermeable by NJDEP (see N.J.A.C. 7:26E-1.8), and the same permeability seems to have been recommended by the sheet pile installation engineer (per the 1/3/01 email attachment). Therefore, the NJDEP does not agree that the till is equivalent to the clay for the purpose of containing the contaminants in the PKC. Further investigation of this matter is needed.

4. **Composition of the Till**

Based on the preceding comment and the suggestion that the clay and till together should provide a sufficiently thick impermeable floor to the containment structure, the composition of the till is an important factor in site characterization. Unfortunately, the variability in composition of the till is not adequately evaluated/discussed in the RIR Addendum.

a. March 2000 Vibrocore Program, Section 4.1

This section states that the till material at the southern end of the PKC was found to have a higher gravel content than the till under the PKP and the northern part of the PKC. In fact, grain size analyses on samples from four of eight Vibrocore borings performed at the southern end of the PKC demonstrated that three of the four samples tested (VIB-3, VIB-4 and VIB-8) consisted of a higher percentage of sand and gravel than silt and clay. The sample from VIB-3 contained 78.9% sand and gravel, including 44.4% gravel and is described in the laboratory report as a silty clayey gravel with sand. The sample from VIB-4 contained 60.4% sand and gravel, including 26.6% gravel and is described as a clayey sand with gravel. The sample from VIB-8 contained 63.0% sand and gravel, including 20.6% gravel and is described as a silty sand with gravel.

The Department notes that Figure 2 depicts clay as being present at locations where it was not encountered and/or as being thicker than what is reported on the corresponding logs. For example:

- Approximately 5 feet of clay is depicted in VIB-01. However, the log in Appendix B notes 0.5 feet of soft dark gray clay with roots (probably meadow mat, but called gray clay on Fig.2), underlain by 0.5 feet of till consisting of gravel and clay. This layer is reportedly underlain by till consisting of silty sand.
- Approximately 5 feet of clay is depicted in the VIB-50-series boring locations and is projected from the VIB-50 locations from a point to the north of the VIB-50 location south all the way to the VIB-49 location. However, clay was not encountered in the VIB-50 borings and its extent north of the VIB-49 borings has not yet been determined.
- Approximately 4 feet of clay is depicted in the DSB-1 boring location. Only 0.5 feet of silty clay (25-25.5 feet) was reported in this boring, underlain by 1.5 feet of silt and clay till with some gravel. The log then reports silty sand down to 39 feet. Silt and clay till with some gravel is again reported from 39-41 feet bgs with no recovery from 41-43 feet, followed by silty sand to 45 feet (the bottom of the boring).
- Only 1 foot of clay was reported in boring DSB-2, but about 2.5 feet is depicted on Figure 2.
- Only 1.5 feet of clay was reported in boring DSB-4, but about 2.5 ft. is depicted on Figure 2.

These discrepancies and any/all other inaccuracies shall be corrected and revised figures shall be presented to depict the correct information as well as the differences in soil type present in the till as shown on logs and cross sections.

6. Composition of Clay, Section 4.3

This section discusses the January 2001 boring program. It states that the clay in the southern part of the PKC is mixed with gravel and is thought to be a clay-till or an erosional lacustrine clay mixed with till where the original Platty Kill Creek drained into the Kill Van Kull. The data from borings DSB-3 and DSB-5 (located next to this part of the PKC) do not support this statement because the logs show 4 feet and 5 feet of clay (without gravel), respectively. Figures 2 and 4 accurately depict the information and correspond with the logs. All of the logs of borings adjacent to the southern part of the PKC except DSB-11 report some clay without gravel. In contrast, the log of boring DSB-10 reports silt with some clay and little gravel in the top two feet of the clay, and silt and clay with little sand and a trace of gravel in the bottom 2 feet of this 4-foot interval. This is the only land-side boring where gravel is reported in the interval depicted as clay. This section of the text does not mention that some of the till encountered in the land-side borings consists of silty sand. Since the logs and figures seem to somewhat contradict the text, a better explanation of the interpretation of the stratigraphy in this area must be provided and be based on the information in the boring logs.

7. Unstable Area

An explanation is needed for the notation "unstable area" along the east bank of the PKP south of boring DSB-2/2R, and of any significance the instability in this area may have for the selected remedial action.

c: James Monkowski, Bayonne Health Department
George Bress, Bayonne Industries, Inc.
Ronald E. Scerbo, ExxonMobil
Andrew Cozzi, Bluestone Environmental Services
Mary Hrenda, BGWPA
John Boyer, BEERA

James E. McGreevey
Governor

State of New Jersey
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Bradley M. Campbell
Commissioner

MEMORANDUM

TO: MIKE KENNEY, CASE MANAGER, BCM

FROM: JOHN E. BOYER, TECHNICAL COORDINATOR, BEERA/EES

SUBJECT: REVIEW OF **FREE PRODUCT INVESTIGATION WORK PLAN**
(DATED MAY 2003)
BAYONNE INDUSTRIES SITE
BAYONNE, HUDSON COUNTY
JC: J010N400 AC: V98K

DATE: 24 OCTOBER 2003

As requested in your referral of 4 June 2003, a technical review has been completed on the aforementioned document prepared by Bluestone Environmental Services for the Bayonne Industries site. The Free Product Investigation Work Plan responds to the department's comments on the Cone Penetrometer (CPT) Survey Findings Report. The Work Plan also proposes a supplemental investigation of two areas discussed in the CPT report and four additional areas of free product:

- Co-Gen/Yard 10 Area
- Yard 4
- Tanks 1701, 1173, and 1174 Area
- Tank 6006 Area
- Tank 5214 Area
- Tank 5073 Area

The document is NOT acceptable to BEERA due to the technical deficiencies and omitted information noted in the comments below.

Site Background

Bayonne Industries, Inc. is a warehousing operation of liquid bulk storage and petroleum products. The 200-acre site is located in the Constable Hook area of Bayonne, Hudson County,

between the Exxon Bayonne Terminal, the Kill Van Kull and East 22nd Street. Historically, the site was operated by the Tidewater Oil Company as a coal terminal, refinery and petroleum liquid terminal from 1870 until 1949. Previous investigations have discovered NAPLs and chromium slag on-site. The Department and Bayonne Industries entered into a Memorandum of Agreement (MOA) on 27 May 1992.

Comments

1. Co-Gen/Yard 10 Area

The Work Plan discusses the results of soil samples collected from the Co-Gen/Yard 10 Area with respect to historic fill. Bluestone shall clarify the intention of mentioning historic fill in relation to the soil data.

The Technical Requirements for Site Remediation (N.J.A.C. 7:26E) defines historic fill material as:

> *non-indigenous material, deposited to raise the topographic elevation of the site, which was contaminated prior to emplacement, and is in no way connected with the operations at the location of emplacement and which includes, without limitation, construction debris, dredge spoils, incinerator residue, demolition debris, fly ash, or non-hazardous solid waste. Historic fill material does not include any material which is substantially chromate chemical production waste or any other chemical production waste or waste from processing of metal or mineral ores, residues, slag or tailings. In addition, historic fill material does not include a municipal solid waste landfill site.*

If Bayonne Industries intends to claim that the soil contamination in this area is related to historic fill, the provisions of the TRSR (7:26E-4.6) must be follow. The limited information contained in the work plan does not constitute technical justification to establish historic fill determination.

2. RCRA Metals Analysis

The work plan continually states that soil samples will be analyzed for "RCRA Metals" using EPA Method 6010B/7471A. RCRA metals analysis is appropriate for waste classification or disposal purposes. However, the soil samples collected at this stage of the investigation are designed to characterize the soil column. Therefore, limiting the analyte list for these lab methods to just the "RCRA metals" is not acceptable to BEERA. All soil samples collected for this work plan shall be analyzed for the full analyte list defined in the EPA Methods (6010B/7471A) and NOT the RCRA subset.

3. Tank 6006 Area, Section 4.4

The Site Investigation Report (dated July 2003) discusses a 20,000-gallon spill originating from a leak at Tank 6003 that occurred on 18 February 2003. An emergency cleanup of free product and contaminated soil was subsequently completed at this AOC. Bluestone collected a series of post-excavation soil samples to verify proper cleanup of the contaminated soils.

The SI Report documents that visual surface oil is still present in the western portion of the dike between Tanks 6003 and 6006. The SI Report concludes that further investigation of this area will be performed as part of the Free Product Investigation Work Plan.

Therefore, the Free Product Investigation Work Plan shall implement a remedial action to address the residual free product associated with the February 2003 discharge. Post-excavation soil samples will be required to verify cleanup of the contaminated soils.

As noted in BEERA's review of the SI Report, the location of the post-excavation samples does not correspond with limits of excavation. Clarify. In addition, the lines designating the limits of excavation appear to be incomplete. Was the excavation extended right up to the edge of the concrete wall and the aboveground storage tanks in the Tank 6003/6006 berm? Bluestone needs to modify the AOC site map (Figure 3) in the SI Report to clearly define the limits of excavation.

According to the SI Report, the storm drain inlets in the tank berm were impacted during the release. Bayonne Industries shall provide the department with any report of the investigation and cleanout of these sewer pipes (as mentioned in the SI Report) and any post-remediation samples collected from the sediments/soils.

4. Tank 5214 Area, Section 4.5

A gasoline spill was reported in the Tank 5214 area in August 1988. Bluestone is proposing to conduct three borings to investigate the area for free product associated with the spill. However, the boring locations are located in the roadway some distance from the tank berm themselves. Are the roadways on raised berms or dikes along the perimeter of the tanks? Why are the borings not located closer to the suspected leaking tank and within the tank containment area (where the spill likely pooled)?

The SI Report concludes that further investigation of the Tank 5077 area will be performed as part of the Free Product Investigation Work Plan. How does the proposed actions in this work plan address the data gaps identified in the SI Report?

5. Tank 5073 Area, Section 4.6

A gasoline spill was reported in the Tank 5073 area in July 1993. Bluestone is proposing to conduct three borings to investigate the area for free product associated with the spill. However, the boring locations are located in the apparent roadway some distance from the tank. Are the roadways on raised berms or dikes along the perimeter of the tanks? Why are the borings not located closer to the suspected leaking tank and within the tank containment area (where the spill likely pooled)?

The SI Report concludes that further investigation of the Tank 5076 area will be performed as part of the Free Product Investigation Work Plan. How does the proposed actions in this work plan address the data gaps identified in the SI Report?

6. Regulatory Overview

The work plan (page 17) refers to the NJDEP's proposed (and never promulgated) *Cleanup Standards for Contaminated Sites* (NJAC 7:26D). This reference/citation is incorrect and must be removed here and throughout the report.

While the proposed cleanup standards were not promulgated, the Department did develop Soil Cleanup Criteria (SCC) that are currently utilized for soil remediation. These criteria are based on the cleanup standards contained in the proposed rule, with noted corrections due to errors identified to the Department during the comment period as well as new toxicological information obtained since the rule proposal.

Please feel free to contact me should you have any questions. I can be reached at ☎ (609) 984-9751 or 💻 john.boyer@dep.state.nj.us. Thank you.

JEB
My documents\word97\bayonne industries\free product investigation wp.503\10.24.03

cc: Teruo Sugihara, Section Chief, BEERA/EES
Mary Hrenda, Geologist, BGWPA

New Jersey Department of Environmental Protection
Site Remediation Program
Division of Publicly Funded Site Remediation
Bureau of Ground Water Pollution Abatement

MEMORANDUM

To: Mike Kenney, Case Manager
BCM, DRPSR

AUG 2 [illegible]

MAH

From: Mary Hrenda, Geologist
BGWPA, DPFSR

Subject: Platty Kill Pond – Letter Report on Test Borings for Sheet Pile Barrier
Bayonne Industries
Bayonne, Hudson County
July 9, 2002

Job #/PAC Code: J010N4B0/V84Y

Background: Bayonne Industries (BI) operates a warehousing and transfer services facility for petroleum products and other chemicals on a 200-acre site on Constable Hook in Bayonne. The site is located adjacent to the Exxon Bayonne Terminal on the Kill Van Kull waterway. Until 1956, the BI site was part of the Tidewater Oil Co.'s refinery. The Platty Kill Pond (PKP) is the upstream end of a former creek, the Platty Kill, that was dredged and straightened for use as a barge canal (the Platty Kill Canal or PKC). The canal drains to the Kill Van Kull and forms part of the boundary between the BI and Exxon Bayonne sites. The PKP itself is located within the boundaries of the BI site and was formerly used as an oil/water separator. The PKP is separated from the canal by a dike made of sand and stone with a low-permeability barrier in the center. The barrier consists of 1/16" nylon-reinforced neoprene liner suspended at the top of the dike, which overlaps a "mud fence", constructed through the lower part of the center of the dike. Ground water in the vicinity of the PKP is known to be contaminated with free petroleum product and dissolved contamination. The bottom of the PKP and much of the bottom of the PKC have been found to be covered with several feet of petroleum-derived sludge that exceeds the applicable standards for PAHs, volatile organics and inorganics including arsenic and lead. BI's proposed remedial action for the sludges in the PKP is to isolate the PKP from the surrounding soil and ground water, which is contaminated with free and residual petroleum product and dissolved contamination with a sheet pile barrier and solidify the sludge inside the barrier. Sludge from the three-foot space between the sheet pile and the existing bulkhead around the PKP and from "hot spots" from the sludge in the PKC is to be incorporated into the sludge in the PKP before it is solidified. A French drain-type recovery trench is to be installed in the space between the sheet pile and bulkhead to recover oil around the outside of the sheet pile. The surface of the PKP is to be brought up to grade, landscaped and protected from vehicular traffic.

The subject document is a report on a boring program to determine whether or not the reddish brown clay/silt found at depths around 26-30 ft. below grade in borings performed inside the PKP is of sufficient thickness and extent to provide a floor for the containment structure for the PKP sludges. Four borings were performed adjacent to the PKP, one on each side. The borings were performed through the entire thickness of the reddish brown clay/silt, into the sediments beneath. One boring (SB-3) was converted into a piezometer (PZ-TILL) screened below the clay. A second, shallower piezometer, screened above the clay/silt, was constructed adjacent to it. These were used to determine the vertical hydraulic gradient across the clay/silt in the vicinity of the PKP.

Comments:

1. BGWPA would like to clarify that field plasticity tests performed on the reddish brown clay/silt encountered between approximately 29.5 and 36 ft. below grade in boring PZ-TILL/SB-3 (the thread test)

indicated that some of this material exhibits moderate to high plasticity. *(Note to case manager: The thread test involves rolling a small portion of a soil sample into a roughly cylindrical "thread". Basically, the thinner the thread, the higher the clay content in the sample. For example, a sample of fine-grained sediment that can be rolled into a thread the diameter of a pencil is a clayey silt, and a silty clay can be rolled into a thread the diameter of a paper clip.)* However, some of the material from this interval had a high silt content and "failed" the thread test (i.e., it could not be rolled into a thread, and so, did not exhibit plasticity). Similar material was reported at similar depths in the borings on all four sides of the PKP. However, in all borings but SB-4, sand and/or gravel was also reported within this interval. In the logs of borings PZ-TILL and SB-2, it is reported that the coarser-grained material might have been washed in with the drilling mud. In all, the results of this drilling program indicate that there might not be as much plastic clay in this interval as NJDEP would have hoped for. However, no elevated PID readings, oil or petroleum sheen was reported below the reddish brown clay/silt, and continuous water level measurements in shallow/deep piezometer pair PZ-OVB and PZ-TILL indicate that there is an upward hydraulic gradient between the sediments below the clay and the material above the clay. It is BI's responsibility to implement an effective remedy for the PKP and to demonstrate its effectiveness over time. BI would have to demonstrate to NJDEP over time that the containment structure is effectively containing the solidified waste in the PKP and isolating it from the free product and contaminated ground water outside the containment structure.

2. BGWPA would also like to clarify that the conclusion at the bottom of p. 1 and top of p. 2 that the clay exhibits sufficient plasticity to rebound to the driven sheet pile barrier wall is BI's. BGWPA can neither endorse nor reject this conclusion, because it does not have the engineering expertise to do so.

3. BGWPA disagrees with BI's description at the top of p. 2 of the gravelly till found beneath the clay as a hardpan. This term refers to a layer that is cemented by relatively insoluble material. The till layer is not cemented. NJDEP also does not agree that BI has demonstrated that the gravelly till layer generally has low permeability. Field and laboratory permeability tests on the till yielded permeabilities in the range of 10^{-6} to 10^{-3}, which indicate that the permeability of this unit varies between low and fairly high permeability (see my memo of 2/14/02).

4. Boring logs SB-1, SB-2 and SB-4 indicate that the area to the north, east and west of the PKP is heavily contaminated with petroleum product to depths ranging from 21 to more than 24 ft. below grade. Petroleum sheen is present to the south of the PKP. Petroleum and petroleum sludge may have migrated through the bulkhead and out of the pond to the surrounding soil and ground water due to tidal action. However, there are probably also other sources for this petroleum contamination. The PKP is located downgradient of many other potential onsite sources, and heavily impacted borings were located on both upgradient and downgradient sides of the PKP. BI shall propose a plan to delineate and remediate this contamination.

5. The well record for piezometer PZ-TILL (well permit # 26-64532) indicates that the diameter of the borehole surrounding the outer casing is only 2 inches greater than the diameter of the casing. Per N.J.A.C. 7:9D-2.2(a) 9, when casing is installed into an oversized borehole, the borehole diameter shall be at least four inches greater than the inside diameter of the well casing to be installed. NJDEP did not authorize any deviations from the regulations in the construction of this piezometer.

If you have any questions or require any further information, please do not hesitate to contact me at 292-9904.

C: E. Fernandez, BGWPA
R. Lux, BGWPA
J. Boyer, BEERA
M. Miller, Bureau of Water Allocation (please see Comment 5)

7644

New Jersey Department of Environmental Protection
Site Remediation Program
Division of Publicly Funded Site Remediation
Bureau of Ground Water Pollution Abatement

MEMORANDUM

To: Mike Kenney, Case Manager
BCM, DRPSR
MAIL

From: Mary Hrenda, Geologist
BGWPA, DPFSR

FEB 1 4 2002

RECEIVED
FEB 20 2002

Subject: Remedial Investigation Addendum Report (RIR Addendum)
Aug. 22, 2001
and
Hot Spot Delineation
Sept. 26, 2001
Bayonne Industries, Inc.
Bayonne, Hudson County

Job #/PAC Code: J010N4A0/V29H

In response to your 10/16/01 referral, BGWPA has completed a technical review of the subject documents (the RIR Addendum and the Delineation Report). BGWPA does not believe that the conclusions of the RIR Addendum are necessarily supported by the data. However, the conclusions are preliminary, because further investigation is proposed. Therefore, BGWPA finds RIR Addendum to be conditionally acceptable as part of an ongoing investigation, provided that that BI addresses the comments below to NJDEP's satisfaction. Review of the RIW Addendum raises some concerns regarding the sludges/sediments outside the areas designated "hot spots". These sludges/sediments include areas in which the impact to ground water soil cleanup criteria (IGWSCC) are exceeded. Further explanation is provided in the comments below. Otherwise, comment on the Hot Spot Delineation is mainly deferred to BEERA.

A. Site Background:

The 200-acre Bayonne Industries (BI) site (the site) has been the location of industrial activity relating to the production and distribution of petroleum products since the 1870's. Beginning in the 1870's the site was occupied by a large refinery operated by the Tidewater Oil Co. In 1956, the site was sold to Bayonne Industries, Inc., which operated it as a bulk liquid storage and distribution terminal. The present owner, IMTT, purchased the site in 1983 and continues to operate it as a storage and distribution terminal for petroleum products, such as gasoline, lubricating and heating oil, plasticizers and "other chemicals". The site has been found to be contaminated with free product and chromium slag in investigations carried out to date. The site is located directly to the west of the Exxon Bayonne site, another former refinery, now primarily a petroleum storage, blending, packaging and distribution facility. The Exxon Bayonne site is also contaminated with free petroleum product and chromium slag. Much of the Exxon Bayonne site now belongs to IMTT/BI. ExxonMobil (EM) is responsible for the remediation of the Exxon Bayonne site and retains a portion of that site. The Platty Kill Canal (the PKC) is a short (approx. 1,000 ft. long) waterway formerly used as a barge canal that forms part of the border between the southern portions of the eastern side of the Bayonne Industries site and the western side of the former Exxon Bayonne site. The PKC discharges to the Kill Van Kull waterway (the KVK). The northern (northwest-southeast-running) portion of the present PKC is a remnant of the original Platty Kill Creek. Much of the original creek was filled in, along with part of the Kill Van Kull, during the development of the sites as refineries. The lower (north-south running) end of the present PKC was left unfilled and possibly also dredged out to form part of the barge canal, along with the still-existing portion of the original creek. For many years, BI used the farthest upstream end of the PKC, which is within the borders of the BI site, as an oil/water separator. This area,

called the Platty Kill Pond (the pond), is now separated from the PKC by an earthen dam with a clay/synthetic liner. Petroleum sludge is present in the bottoms of both the pond and the PKC, and petroleum sheens are present on the surface of the water in both. BI alone is responsible for the remediation of the pond, which is completely within the borders of the BI site. The subject RIR Addendum pertains to the PKC only, and not the pond, for which a separate Remedial Action Selection Report (RASR) has been developed. BI and EM are jointly and severally responsible for the remediation of the PKC. BI is the lead contact with NJDEP, by agreement between BI and EM.

In 1991, a sheet pile dam was installed across he mouth of the PKC, which restricts sediment migration from the PKC into the KVK. In the summer of 1993, the Coast Guard directed that measures be implemented to curtail the discharge of free-phase product from the PKC into the KVK. In response, BI implemented interim remedial actions (IRAs) including: reconstruction of a portion of the bulkhead, installation of a subsurface barrier to free-product migration along the KVK shoreline, installation of an Air Guard™ containment system to prevent migration of free product sheen from BI's side of the PKC into the KVK, and initiation of an investigation to characterize the sediments in the PKC. BI's 9/26/01 Technical Modifications to the Platty Kill Canal, Hot Spot Delineation, one of the subject documents (see below), is BI's latest submission on the characterization/delineation of impacted sediments in the PKC. In response to NJDEP's Nov. 24, and Dec. 16, 1999 letters, BI and EM submitted a joint Remedial Action Selection Report (RASR) to NJDEP for the PKC on Feb. 18, 2000. NJDEP conditionally approved the RASR in its July 13, 2000 letter to BI. The conditional approval letter identified significant data gaps that must be filled in order to determine whether or not the proposed remedy is actually feasible. The subject RI Addendum reports on BI's progress toward filling these data gaps.

B. Proposed Remedial Action: The proposed remediation consists of containment of contaminated sludges along with the establishment of engineering and institutional controls for the area of concern (AOC), along with the removal and/or solidification of "hot spots". BI and EM propose to fill the PKC with dredge spoil from BI's West Side piers. BI also proposes to hydraulically isolate the PKC from shallow ground water and associated contamination and from the KVK by installing vinyl sheet pile around the perimeter of the PKC. Before beginning to fill the PKC, a new, stronger, anchored sheet pile bulkhead is proposed to be installed just inside the existing sheet pile bulkhead near the mouth of the PKC. The actual location and bottom depth of the sheet pile bulkhead have not been determined. The plan states that free product will be remediated and recovered as practicable as part of site preparation, in accordance with specific plans to be included in the RAW. In addition, obstructions such as pipes, boulders, debris, collapsed bulkheads, etc. will have to be removed prior to installing vinyl sheet pile around the remaining three sides of the PKC. Hot spots in the PKC will be removed and properly disposed and/or treated prior to filling by stabilization or incorporation into the pond and stabilization along with the sludges in the pond. The PKC is then proposed to be filled with dredge spoil from BI's West Side piers. The vinyl sheet pile is proposed to be keyed into a red-brown glacial silt/clay layer that had been encountered in some earlier borings in the pond and on the Exxon side of the PKC to complete an impermeable containment. The RASR for the PKP stated that this glacial clay was present beneath the PKP at a thickness of 15 ft. However, no data were presented in the RASR to demonstrate that the clay was present at this thickness continuously beneath the bottom of the entire PKC. BI and EM have yet to verify the presence of this glacial silt/clay beneath the entire PKC, as well as its thickness. An inward hydraulic gradient will be maintained by pumping water from the sediments within the sheet pile. The design will include free product recovery from this pumped water. The proposed cap will include a 60 mil HDPE geomembrane installed over a bedding layer on top of the dredge spoil, with a drainage sand layer on top of the HDPE liner and a vegetated soil cover on top. The vegetated cover will be planted with species that will effectively minimize erosion and have roots that will not penetrate below the drainage sand layer. The final cap will be sloped towards the outside of the sheet pile bulkheads on the sides of the PKC, and surface runoff is proposed to be captured and directed towards the site stormwater drainage system. The existing steel sheet pile dam (outside of the new steel sheet pile dam) is to be removed.

C. Description of 2001 RI Addendum: One of the stipulations of NJDEP's conditional approval of the RASR for the PKC was that BI must demonstrate the presence of a continuous clay layer beneath the proposed containment area with thickness and impermeability characteristics sufficient to satisfy the remedial objectives of the project. NJDEP did not specify a numerical minimum thickness of the clay.

This was because of the engineering considerations involved in keying the bottom of the sheet pile into the clay. There must be a sufficient thickness of the clay present to form an impermeable seal around the bottom of the sheet pile, as well as to form an impermeable base for the proposed containment cell. In a Jan. 3, 2001 letter attached to an email to the NJDEP case manager for BI, BI stated that their sheet pile installation engineering consultant reported that a minimum clay thickness of five ft. would be enough to ensure an adequate seal between the sheet pile and the clay and provide an impermeable base to the containment cell at a permeability of 10^{-7} cm/sec. One of the objectives of the RI Addendum was to verify the presence of a continuous clay layer of sufficient thickness and impermeability beneath the PKC to isolate the contaminants in the proposed containment structure. Another objective of the RI Addendum was to determine the areas in which obstructions to the installation of sheet pile exist along the sides of the PKC. To determine the locations of obstructions to the installation of sheet pile along the sides of the PKC and to determine the thickness and extent of the clay in the PKC, 76 Vibrocore borings were performed in 38 locations, mostly along the sides, but also in the middle of the canal. Due to the limited penetration capabilities of the Vibrocore drilling method at this site and the desire not to fully penetrate the floor of the proposed containment structure, eleven soil borings were performed on land along both sides of the PKC to determine the thickness of the clay layer. BI requested that the total depth of these borings be limited to 45 ft. NJDEP agreed to this, as long as the borings demonstrated that a sufficiently thick clay layer was present to meet the project objectives. From previous soil boring logs from the site (e.g., Weston 1979), it was believed that the clay was a clay-till with little to no gravel in the top few feet and fine to coarse gravel in deeper portions. BI states that they found a geologic contact in the northern portion of the PKC, where a clay overlies a glacial till. Based on that information, they are considering the clay and the till to be separate geologic units. Please see Comment 4, below, for further discussion of the glacial till.

Permeability testing of the clay and till was performed by three different methods. Laboratory falling head permeability testing was performed on undisturbed samples from four shelby tube samples of the clay from the soil borings performed on land and three selected Vibrocore samples. Laboratory falling head tests were performed on two reconstituted samples of the till. Field falling head permeability testing was performed on the till in three land soil borings.

Comments

D. RIR Addendum:

1. Confirmation of the Presence of the Clay Below the Bottom of the PKC: BGWPA disagrees with the statement in Conclusion 1 on p. 14 that describes the area in the bottom of the PKC where the presence of clay has not been confirmed. This area was defined by BI as an area approximately 300 ft. long on the EM side, between Vibrocore borings VIB-16 and VIB-11, and approximately 100 ft. long in the BI side, between Vibrocore borings VIB-37 and VIB-39. This area is shown in blue on Fig. 4. Logs of Vibrocore borings in Appendix B indicate that no clay was encountered in a number of borings in the middle of the PKC and on the BI side both to the north and south of the area depicted by BI. To the north, away from the EM side, no clay was encountered in VIB-51-1 or VIB-51-10 through 13, VIB-36-1 through 5 and VIB-37-1 and 2. BGWPA notes that clay was encountered in boring VIB-36-6 in this area, but not in any of the above-named borings in the surrounding area. BGWPA also notes that BI indicates on Fig. 3 that obstructions may be present in the bottom of the PKC in the area of borings VIB-36-1 through 5 and VIB-51-10 through 12, which may have stopped the progress of these borings before they reached the clay. Whatever the circumstances, however, it is still the case that the Vibrocore boring program failed to demonstrate the presence of the clay beneath this area of the PKC. BI must demonstrate that the clay is present in this area at a sufficient thickness, if they intend to use this part of the PKC as part of the proposed containment structure. To the south of the area in which BI states that the clay was not encountered in Vibrocore borings in the PKC, the Vibrocore boring logs in Appendix B indicate that clay was not encountered in borings VIB-40-1, VIB-40-4, VIB-41-1 and 2, and VIB-42-1 and 2. BI indicates that obstructions in the PKC stopped the progress of these borings before they could encounter the clay. However, since there is, as a result, no evidence for the presence of the clay beneath the bottom of the PKC in this area, BI must also confirm the presence and thickness of the clay here. Based on the evidence in the Vibrocore boring logs in Appendix B, the area in which the presence of clay beneath the bottom of the PKC must be confirmed has the same length on the EM side as the area described by BI in the RI

Addendum. However, on the BI side, it extends approximately 300+ ft. between VIB-36-1 through 4 and VIB-42. In addition, since the VIB-50 boring location, where no clay was encountered, and VIB-49 location, where clay was encountered, are approximately 160 ft. apart, the extent/continuity of the clay should be better defined in this area. The proposal in Recommendation 1 in Section 6.0 shall be modified to confirm the presence of the clay beneath the PKC in this larger area.

2. Soil Sampling Procedure, Recommendation 1 in Section 6.0, and Lack of NJDEP Approval for QAPP: BI states in the second paragraph under Recommendation 1 in Section 6.0 that BI's "Remedial Investigation Addendum for Sampling Clay-Till", dated Aug. 2000 will be followed in the above proposed investigation. BI is referred to NJDEP's Nov. 15, 2000 comment letter on the Aug. 2000 RI Addendum. BI also states that they will be using the "Conventional Drilling Soil Sampling Procedure" in BI's March 1999 QAPP. Please note that BI's March 1999 QAPP has not been approved by NJDEP. BI is referred to Comment 6 on p. 4 of 5 in NJDEP's June 10, 1999 comment letter to BI on its March 1999 Free Product Investigation Workplan (FPIW). NJDEP did not perform a formal review of the QAPP at the time it was submitted, because the above FPIW, with which the QAPP was submitted, did not include any proposals for sampling by any of the methods covered in the QAPP. Since the QAPP was not reviewed by NJDEP, it was excluded from the conditional approval of the FPIW. BI was directed in the above-referenced comment in NJDEP's 6/10/99 letter to re-submit to NJDEP a QAPP that conforms to the minimum requirements established by the TRSR at such time as the sampling methods included in the QAPP were proposed for use in the free product delineation investigation. Since BI is now referencing the unapproved 1999 QAPP for the PKC pre-design investigation, BI must submit a QAPP that covers, at a minimum, all the field and laboratory procedures proposed to be used in the additional pre-design investigation at the PKC to NJDEP for review.

3. Thickness of Confining Unit (Bottom of Proposed Containment Cell): As stated above, BI told NJDEP in a 1/3/01 email attachment that its sheet pile installation engineer had informed BI that a clay thickness of 5 ft. would be needed to provide an adequate seal around the bottom of the sheet pile and have an adequate clay thickness below the bottom of the sheet pile. The logs of the borings performed on land in Appendix A indicate that clay thicknesses ranging from 0.0 ft. (DSB-11) to 8.5 ft. (DSB-9) were encountered in these borings. Less than 5 ft. of clay was encountered in borings DSB-1 (0.5 ft.), DSB-2 (1 ft.), DSB-4 (1.5 ft.), DSB-7 (3 ft.), DSB-8 (4 ft.), DSB-10 (2 ft.) and DSB-11 (0.0 ft.). All of the laboratory permeability tests yielding permeabilities in the 10^{-7} cm/sec range were performed on samples from intervals logged as clay in land borings and Vibrocore borings. Conclusion 5 in Section 5.5 states that the results of field observations and the laboratory permeability analyses have demonstrated that the clay and clay-till together would form an impermeable barrier that would be effective in retarding the vertical migration of contaminants. However, permeability tests performed on the till yielded permeabilities in the 10^{-3} to 10^{-6} cm/sec ranges. A permeability of 10^{-7} cm/sec is considered impermeable by NJDEP (see N.J.A.C. 7:26E-1.8), and the same permeability seems to have been recommended by BI's sheet pile installation engineer per BI's 1/3/01 email attachment. So, BGWPA does not believe that BI has demonstrated that the till is necessarily equivalent to the clay for the purpose of containing the contaminants in the PKC. Further investigation of this matter is needed.

4. Composition of the Till: Since it is proposed that the clay and till together should provide a sufficiently thick impermeable floor to the containment structure, the composition of the till is an important factor in site characterization. BGWPA believes that the variability in composition of the till was somewhat glossed over in the report.

a. March 2000 Vibrocore Program, Section 4.1: BI states in this section that the till material at the southern end of the PKC was found to have a higher gravel content than the till under the pond and the northern part of the PKC. In fact, grain size analyses on samples from four of eight Vibrocore borings performed at the southern end of the PKC in March 2000 demonstrated that three of the four samples tested (VIB-3, VIB-4 and VIB-8) consisted of a higher percentage of sand and gravel than silt and clay. The sample from VIB-3 contained 78.9% sand and gravel, including 44.4% gravel and is described in the laboratory report as a silty clayey gravel with sand. The sample from VIB-4 contained 60.4% sand and gravel, including 26.6% gravel and is described as a clayey sand with gravel. The sample from VIB-8 contained 63.0% sand and gravel, including 20.6% gravel and is described as a silty sand with gravel. The

four samples sent to the lab for testing in March 2000 could not be tested for permeability, because they fell apart while being trimmed for permeability testing. BI provided NJDEP with the test results on these samples together with a cover letter from the lab. The cover letter expressed an opinion, not based on testing, but on the experience of the analyst, that the samples might have a permeability of 10^{-6} to 10^{-8} cm/sec. However, BGWPA remains concerned that the clay and till with a significant sand and gravel content may not form an effective seal with the bottom of the sheet pile. This is especially of concern in areas in which no clay or less than 5 ft. of clay is present. BI shall respond to this concern.

b. Besides the presence or absence of clay in borings and the higher gravel content of the till in the southern portion of the PKC, the variability in the composition of the till is not addressed. The till is variously referred to as a clay-till and a gravel-clay till. However, its composition is more variable, as demonstrated by the logs in Appendix A. For example:

- The bottom foot of boring DSB-6 and the bottom two ft. of boring DSB-2 are described as till consisting of silty sand with little or some gravel.
- The interval above the silty sand in boring DSB-2, from 29-33 ft. bgs, is described as silt with little clay and little fine to coarse gravel.
- The till in the top three feet of the till interval in DSB-11, in which it is reported that no clay was encountered, is logged as silt with some gravel and a trace of clay.
- More silty sand than silty clay or silt and clay till is reported in the log of DSB-01 in the depth interval in which the till is found in other borings. In this boring, the reddish brown silty sand was not logged as till, as it was in the other boring logs.

BI shall discuss the variability in the composition of the till, the significance it has to the successful implementation of the proposed remedy.

5. Depiction of the Till - Fig. 4, Clay-Till Thickness and Delineation Map with Historic Shoreline Overlay, and Fig. 2, Generalized Cross Sections Platty Kill Canal: On both of these figures, the till is depicted with the same symbol, no matter what its composition. Since the till has been found to have a variable composition, ranging from clay through silt to silty sand, all with varying amounts of gravel, it would have been more useful to depict these compositional differences on the graphic logs on Fig. 4 and the cross-sections on Fig. 2. This is particularly true since one of the main purposes of the investigation is to determine the horizontal and vertical extent of the geologic material beneath the PKC that would be capable of providing a containment cell for the contaminated sludges/sediments in the PKC. BGWPA notes that clay is depicted on Fig. 2 in locations where it was not encountered and/or at a greater thickness than that documented in the logs. For example:

- Approximately 5 ft. of clay is depicted in boring Vibrocore boring VIB-01. However, the log in Appendix B notes 0.5 ft. of soft dark gray clay with roots (probably meadow mat – called grey clay on Fig.2), underlain by 0.5 ft. of till consisting of gravel and clay. This is reportedly underlain by till consisting of silty sand.
- Approximately 5 ft. of clay is depicted in the VIB-50-series boring locations and is projected from the VIB-50 locations from a point to the north of the VIB-50 location south all the way to the VIB-49 location. Clay was not encountered in the VIB-50 borings, and its extent north of the VIB-49 borings has not yet been determined.
- Approximately 4 ft. of clay is depicted in the DSB-1 boring location. Only 0.5 ft. of silty clay (25-25.5 ft.) was reported in this boring, underlain by 1.5 ft. of silt and clay till with some gravel. The log then reports silty sand down to 39 ft. Silt and clay till with some gravel is again reported from 39-41 ft. bgs., with no recovery from 41-43 ft., followed by silty sand to 45 ft. (the bottom of the boring).
- Only 1 ft. of clay was reported in boring DSB-2, but about 2.5 ft. is depicted on Fig. 2.
- Only 1.5 ft. of clay was reported in boring DSB-4, but about 2.5 ft. is depicted on Fig. 2.

BI shall correct the discrepancies noted above and depict the differences in soil type present in the till on logs and cross sections.

6. Composition of Clay, Section 4.3: In the fifth paragraph of Section 4.3 (January 2001 Delineation Soil Boring Program), BI states that, in the southern section of the PKC, the clay is mixed with gravel and is thought to be a clay-till or an erosional lacustrine clay mixed with till where the original Platty Kill Creek drained into the KVK. BGWPA notes that, in contradiction to this, borings DSB-3 and DSB-5, which are located alongside this part of the PKC, are logged as having 4 ft. and 5 ft. of clay (without gravel), respectively, and are depicted this way on Figs. 2 and 4. All of the logs of borings adjacent to the southern part of the PKC except DSB-11 report some clay without gravel. In contrast to this, the log of boring DSB-10, beside the northern portion of the KVK, reports silt with some clay and little gravel in the top two ft. of the interval depicted as clay on the figures and silt and clay with little sand and a trace of gravel in the bottom 2 ft. of this 4-ft. interval. This is the only on-land boring in which gravel is reported in the interval depicted as clay. This section of the text does not mention that some of the till encountered in the on-land borings consisted of silty sand. Since the logs and figures seem to somewhat contradict the text, BI should provide a better explanation of their interpretation of the stratigraphy in this area and relate it to the information in the boring logs.

7. An explanation is needed for the notation "unstable area" along the east bank of the PKP south of boring DSB-2/2R, and of any significance the instability in this area may have for the proposed remedial action.

E. Hot Spot Delineation: Hot Spot 4, which corresponds to the location of sediment sample Y9-PKC-SED-17B, is located near the southern end of the area in which the presence of clay beneath the PKC has been confirmed. Removal and/or treatment of contaminated sediments in "hot spots" is proposed as part of the remedial action. However, sediments in areas not determined to be "hot spots" include sediments that exceed the IGWSCC and 10,000 ppm TPH, and have elevated concentrations of arsenic and lead. The RASR proposes to leave these sediments in place and encapsulate them in the proposed containment structure. This is acceptable, if it can be demonstrated that there is a sufficiently impermeable "floor" to the containment structure beneath them, and that an impermeable seal can be formed between the "floor" and "walls" of the containment structure in the areas where the exceedances occur. Exceedances of the impact to ground water soil cleanup criteria (IGWSCC) for total xylenes, naphthalene, 2-methylnaphthalene and phenanthrene were detected in other sediment samples in the area in which the presence of clay was not confirmed (i.e., Y9-PKC-SED-19, 21 and possibly 23) (see the March 25, 1998 PKC Phase II Sediment Investigation Report). Total petroleum hydrocarbons (TPH) concentrations exceeding 10,000 ppm were detected in the above samples plus Y9-PKC-SED-05A and B, 06B and 20A, B and C. If containment of the contaminated sediments/sludges in this area is found to be infeasible, BI will have to recommend another, feasible remedial method for this part of the PKC. Further comment on this document is deferred to BEERA.

If you have any questions or require any further information, please do not hesitate to contact me at 292-9904.

C: E. Fernandez, BGWPA
G. Czock, BGWPA
J. Boyer, BEERA

6572

State of New Jersey
Department of Environmental Protection

Christine Todd Whitman
Governor

Robert C. Shinn, Jr.
Commissioner

RECEIVED

MEMORANDUM

TO: MIKE KENNEY, CASE MANAGER, BCM

FROM: JOHN E. BOYER, TECHNICAL COORDINATOR, BEERA/EES

SUBJECT: REVIEW OF **REVISED "HOT SPOT" DEFINITION** (11 APRIL 2001)
BAYONNE INDUSTRIES SITE
BAYONNE, HUDSON COUNTY
JC: J010N4A0 AC: V98M

DATE: 4 MAY 2001

As requested in your referral of 18 April 2001, a technical review has been completed on the aforementioned document prepared by Bluestone Environmental Services for the Bayonne Industries sites. BEERA previously commented (J. Boyer to M. Kenney, dated 20 February 2001) on the definition of sediment "hot spots" in the Platty Kill Creek. The definition has been modified to reflect BEERA's technical issues.

Bayonne Industries and ExxonMobil have agreed to cooperate in the remediation of the Platty Kill Canal (PKC). The PKC lies on the border between their respective properties. As part of the proposed remediation action, sediments contaminated with high concentrations of PAHs, volatile organic compounds and inorganic analytes will be excavated and incorporated into the Platty Kill Pond remediation project. The "hot spot" definition is BI proposal to designate the limits of contaminated sediments in the Platty Kill Creek subject to excavation and remediation.

Previously, BEERA noted that the proposal failed to evaluate high concentrations of inorganic analytes within the "hot spot" definition. Bluestone has assessed the elevated lead and arsenic concentrations, using the Non-Residential Direct Contact Soil Cleanup Criteria as the appropriate standard for metals.

The revised "hot spot" definition and proposed limits of excavation reflect the incorporation of elevated arsenic and lead contamination in sediments. However, the volume of sediments to be removed from the Platty Kill Creek has changed from 7,350 cubic yards to 6,760 cubic yards in the new proposal. Bayonne Industries shall justify the 10 % reduction in the volume of contaminated sediments that will be transferred to the Platty Kill Pond for treatment.

Pending resolution of the "volume" issue, the proposed "hot spot" definition is acceptable to BEERA. As stated in our prior memo, this "hot spot" definition is site-specific, based on the particular circumstances of the Platty Kill Creek and Pond.

Please feel free to contact me should you have any questions. I can be reached at ☎ (609) 984-9751 or 🖳 jboyer@dep.state.nj.us. Thank you.

JEB
My documents\word97\bayonne industrieshot spot definition-revised.401.doc\5.4.01

cc: Kevin Schick, Section Chief, BEERA/EES
Mary Hrenda, Geologist, BGWPA
Mark Walters, Case Manager, BCM

New Jersey Department of Environmental Protection
Site Remediation Program
Division of Publicly Funded Site Remediation
Bureau of Ground Water Pollution Abatement

MEMORANDUM

To: Mike Kenney, Case Manager
BCM, DRPSR

From: Mary Hrenda, Geologist
BGWPA, DPFSR

NOV 1 - 2000
RECEIVED

Subject: Remedial Investigation (RI) for Sampling Clay-Till
Platty Kill Canal (PKC)
Bayonne Industries (BI)
Bayonne, Hudson County
Aug. 30, 2000

BGWPA has completed a technical review of the subject document and has found it to be conditionally acceptable, provided that the comments below are addressed.

Background: The 200-acre Bayonne Industries (BI) site (the site) has been the location of industrial activity relating to the production and distribution of petroleum products since the 1870's. Beginning in the 1870's the site was occupied by a large refinery operated by the Tidewater Oil Co. In 1956, the site was sold to Bayonne Industries, Inc., which operated it as a bulk liquid storage and distribution terminal. The present owner, IMTT, purchased the site in 1983 and continues to operate it as a storage and distribution terminal for petroleum products, such as gasoline, lubricating and heating oil, plasticizers and "other chemicals". The site has been found to be contaminated with free product and chromium slag in investigations carried out to date. The site is located directly to the west of the Exxon Bayonne site, another former refinery, now primarily a petroleum storage, blending, packaging and distribution facility. The Platty Kill Canal/creek (the canal) forms part of the border between the southern portions of the eastern side of the Bayonne Industries site and the western side of the former Exxon Bayonne site and discharges to the Kill Van Kull waterway. The northern (northwest-southeast-running) portion of the present Platty Kill Canal is a remnant of the original Platty Kill Creek. Much of the original creek was filled in, along with part of the Kill Van Kull, during the development of the site as a refinery. The lower (north-south running) end of the present Platty Kill Canal was left unfilled and may also have been dredged out to form a barge canal, along with the still-existing portion of the original creek. For many years, BI used the farthest upstream end of the canal, which is within the borders of the BI site, as an oil/water separator. This area, called the Platty Kill Pond (the pond) is now separated from the canal by an earthen dam, and will be remediated (solidification is planned) under a separate RAW. Oily sludges are present in both the pond and canal. These sludges and the underlying sediments are highly contaminated, mostly with TPH, PAHs, metals (primarily arsenic and lead), petroleum-related volatiles and other contaminants. Sludges and sediments in the pond and the upstream end of the canal have been found to be more highly contaminated than those closer to the mouth of the creek. Oily sheens are present on the surfaces of both water bodies. Free product has been detected in monitor wells installed next to the pond, and also in monitor wells next to the canal on both the BI and former Exxon Bayonne sides. BI and Exxon have agreed to cooperate in remediating the canal.

Borings have been performed in the pond and canal to sample the sludges and sediments for chemical characterization and to determine the physical characteristics of the sediments immediately underlying the contaminated zone. Evidence from these borings indicates that, in the pond, the contaminated sludges are underlain by a sand layer, which, according to boring logs from the pond and canal, may be approximately 1-7 ft. thick. Underlying the sand in the pond and in the canal near the pond is a red-brown silt with gravel, grading into silty clay and clay. Vibrocore borings near the mouth of the canal Borings performed adjacent

place to seal off the sand layer, which may be contaminated with NAPL and/or dissolved contamination on the BI side, as it is on the former Exxon side of the canal. The sand layer has not been penetrated in the vicinity of the canal on the BI side. BI then proposes to drill inside the smaller set of augers using the mud rotary method to a maximum depth of 15 ft. below the top of the till. BI proposes to take split spoon samples at a minimum of every five ft. and a shelby tube sample of the till in each boring. All soil samples are proposed to be described by environmental consulting company personnel and screened with A PID.

Comments:

1. The exploratory soil borings proposed to be installed on land, along the sides of the canal, shall be double cased, with the outer casing grouted into the meadow mat and the inner casing grouted into the top of the till. In accordance with NJDEP casing requirements, the borehole diameter outside the casing shall be a minimum of four inches larger than the outer diameter of the casing, and the outer casing diameter shall be a minimum of four inches greater than the inner casing diameter. Each casing shall each be drilled one foot, and driven one additional foot into the confining layer, and the annular spaces between the formations and casings and between the outer and inner casings shall be tremie grouted with an NJDEP-approved grout.

2. The exploratory soil borings proposed to be installed on land, along the sides of the canal shall be continuously split spoon sampled for the total depth of the boring, except for the interval in the till that is sampled with a shelby tube sampler. The reason for this requirement is that the purpose of the borings is to determine/verify the stratigraphy along the length of the canal on both sides and to determine whether or not it is suitable for the implementation of BI's proposed remedy. Split-spoon sampling every five ft. will not provide sufficiently high quality data for this purpose, particularly since the mud rotary method is proposed to be used for drilling in the till. In addition, the information gained from this effort will be a very useful contribution to the delineation of the horizontal and vertical extent of free and residual NAPL along the canal, which has not yet been performed on the BI side. This effort will also be useful to provide information on contamination in the silty sand/sand and gravel unit on the former Exxon side along the lower part of the canal.

3. The Soil Sampling Protocol (Attachment A) states under Item III (Abandonment of Borings) that, upon completion of sampling and monitoring activities at each boring, the hole will be filled with bentonite and/or cement in accordance with state regulations. NJDEP wishes to clarify that the soil borings proposed to be performed on land shall be sealed in accordance with the March 1993 revision of the Jan. 8, 1990 memorandum to all New Jersey Test Borer Certification applicants and all New Jersey Journeyman Well Driller applicants from Section Chief Robert Mancini, NJDEP Bureau of Water Allocation (attached). That is: all borings shall be tremie grouted from the bottom up with an NJDEP-approved grout, and the grout shall be pumped into the borehole until the density of the grout coming out of the top of the borehole is the same as the density of the grout being pumped in. An NJDEP Well Abandonment Report form shall be completed for each on-land soil boring. Sealing of the Vibrocore borings in the canal is not required under the scope of work proposed, as long as these borings mainly penetrate the sludges/contaminated sediments in the canal, only minimally penetrate the underlying till and do not fully penetrate a confining unit. If this is so, they are anticipated to be within the volume of material to be remediated/contained. It is most important that the boring program in the canal not compromise the remediation of this AOC.

4. All borings shall be drilled by a New Jersey licensed well driller or New Jersey certified borer under the required number of blanket boring permits. An NJDEP Monitoring Well Record form shall be completed for each boring by the licensed well driller or certified borer.

5. Section V of the Soil Sampling Protocol (Attachment A) states that the driller shall maintain a detailed boring log of the operations during all drilling proceedings and that this log should be available to the consultant for inspection at all times. In addition, each boring (on land and in the canal) shall be logged by a qualified geologist or hydrogeologist. This log shall include all the information required under N.J.A.C. 7:26E-3.6(a) 2. Geologist's logs of all borings and as-built drawings indicating the depths and diameters of all casings (as applicable) shall be included in the RI report for this project.

New Jersey Department of Environmental Protection
Site Remediation Program
Division of Publicly Funded Site Remediation
Bureau of Ground Water Pollution Abatement

MEMORANDUM

APR 1 0 2000

To: Mike Kenney, Case Manager
BCM, DRPSR

From: Mary Hrenda, Geologist
BGWPA, DPFSR

Subject: Remedial Action Selection Report (RASR), Platty Kill Pond
Bayonne Industries
Bayonne, Hudson County
Dec. 1999
and
RASR, Platty Kill Creek
Bayonne Industries
Bayonne, Hudson Co.
Feb., 2000

BGWPA has completed a technical review of the subject documents. BGWPA has some questions and concerns regarding BI's proposals.

Background: The 200-acre Bayonne Industries (BI) site (the site) has been the location of industrial activity relating to the production and distribution of petroleum products since the 1870's. Beginning in the 1870's the site was occupied by a large refinery operated by the Tidewater Oil Co. In 1956, the site was sold to Bayonne Industries, Inc., which operated it as a bulk liquid storage and distribution terminal. The present owner, IMTT, purchased the site in 1983 and continues to operate it as a storage and distribution terminal for petroleum products, such as gasoline, lubricating and heating oil, plasticizers and "other chemicals". The site has been found to be contaminated with free product and chromium slag in investigations carried out to date. The site is located directly to the west of the Exxon Bayonne site, another former refinery, now primarily a petroleum storage, blending, packaging and distribution facility. The Platty Kill Creek (the creek) forms part of the border between the southern portions of the eastern side of the Bayonne Industries site and the western side of the former Exxon Bayonne site and discharges to the Kill Van Kull waterway. The northern (northwest-southeast-running) portion of the present Platty Kill Creek is a remnant of the original Platty Kill Creek. Much of the original creek was filled in, along with part of the Kill Van Kull, during the development of the site as a refinery. The lower (north-south running) end of the present Platty Kill Creek was left unfilled and may also have been dredged out to form a barge canal, along with the still-existing portion of the original creek. For many years, BI used the farthest upstream end of the creek, which is within the borders of the BI site, as an oil/water separator. This area, called the Platty Kill Pond (the pond) is now separated from the creek by an earthen dam. According to Fig. 2-3 in the Nov. 1979 Evaluation of Control Alternatives for the Separator Pond, there is a 1/6"nylon-reinforced neoprene liner in the center of the dam. According to this drawing, approximately the bottom 5 ft. of the liner overlap with approximately the top 5 ft. of a "mud fence," constructed within the center of the bottom of the dam. This drawing seems to indicate that the bottom of the "mud fence" is at elevation −10ft. Drawing 2-2 in the 1979 Weston report indicate that the dam is constructed on top of a glacial silt/clay (see next paragraph). However, given that there is a 5-10 ft. discrepancy between the elevation of the bottom of the dam shown in the 1979 Weston report and the elevations of the top of the silt/clay determined from borings performed adjacent to the creek, it is uncertain that this is the case. Oily sludges are present in both the pond and creek. These sludges and the underlying creek sediments are highly contaminated, mostly with TPH, PAHs, metals (primarily arsenic and lead), petroleum-related volatiles and

other contaminants. Since 1991, BI has been trying to bioremediate the pond. Bioremediation efforts included in-situ mixing and aeration. These efforts have not been successful in remediating the contaminants in the sludges and sediments in the pond to concentrations that would be protective of ground and surface water. Sludges and sediments in the pond and the upstream end of the creek have been found to be more highly contaminated than those closer to the mouth of the creek. Oily sheens are present on the surfaces of both water bodies. Free product has been detected in monitor wells installed next to the pond, and also in monitor wells next to the creek on both the BI and former Exxon Bayonne sides. BI and Exxon have agreed to cooperate in remediating the creek.

Borings have been performed in the pond and creek to sample the sludges and sediments for chemical characterization and to determine the physical characteristics of the sediments underlying the contaminated zone. Evidence from these borings indicates that the contaminated sludges are underlain by a sand layer, which, according to boring logs from the pond and creek may be approximately 1-7 ft. thick. Underlying the sand is a red-brown silt with gravel, grading into silty clay and clay. It is not known whether this silt/clay unit is present beneath the entire length of the creek. The actual thickness of this silt/clay layer in the vicinity of the Platty Kill Pond and Creek is unknown at this time. Data from borings performed adjacent to the canal on the Exxon and BI sides indicate that the top of the silt/clay is at about –15-20 ft. msl near the bend in the creek. In borings performed in the pond by Roy F. Weston, Inc. (Weston) in 1979, the silt/clay was penetrated to depths of 6.75 to 11.25 ft. below its top in four locations, without encountering the bottom of the clay. It is described as containing gravel beginning from 1 to 6 ft. below the top of the unit. The silt/clay was also encountered in borings performed in the pond by the vibracore method in 1998 by BI's consultant, Bluestone Environmental Services (Bluestone), at depths ranging from 23 to 31 ft. below a measuring point at 8.7 ft. above the surface of the water in the pond. Three of these borings penetrated the silt/clay to depths of 2, 4 and 5 ft. below the top of the silt/clay. Three samples of the silt/clay were taken and tested for permeability. Permeabilities of the samples ranged between $2.8x10^{-6}$ and $4.7x10^{-7}$ cm/sec. The elevations of Bluestone's borings were not surveyed, but they estimate the top of the clay as being approximately 28 ft. below grade beneath the bottom of the pond. On the Exxon side of the canal, borings performed along the north end of the canal indicate the presence of a red-brown silt, grading into a silty clay, then into clay. The borings on the Exxon side penetrated the silt/clay to a depth of about 4.5 ft. below its top.

Summary of Proposed Remedial Actions:

A. Platty Kill Pond: The remediation proposal for the pond is to stabilize the sludges and contaminated sediments in the pond by solidifying them in a matrix consisting of a mixture of such materials as Portland cement, bentonite, cement kiln dust, fly ash, etc. The exact mixture will be determined by treatability studies that will have been performed by the contractor. BI says that the performance goals for the stabilized matrix are:

- stabilization of all metals such that the leachate passes established TCLP levels and
- hydraulic conductivity of no more than $1x10^{-6}$ cm/sec.

BI does not propose hydraulic or physical containment of the pond other than the existing wooden bulkheads (depth unknown) around the north, west and south sides and the earthen dam with a plastic/"mud fence" liner at the east side of the pond. Dewatering of the pond is anticipated during the stabilization process, and the water will be treated in an existing water treatment plant. BI proposes to cover the stabilized sludge material with clean fill and an asphalt cap. They intend to use the area as a truck parking and turnaround area.

BI states that the material to be stabilized includes the sludges in the pond and the underlying sand, down to the top of the underlying red glacial silt/clay. The Feb. 2000 RASR for the creek states in Section 3.5 that the most highly impacted sediments, or "hot spots," from the creek will most likely also be incorporated into the stabilized material in the pond (see Comment A3, below).

Comments:

1. BI intends to use the area of the pond, after stabilization, as a parking/turnaround area for trucks. BGWPA is concerned that the loading and stresses associated with trucks parking on and driving over the

stabilized petroleum sludge material in the pond may cause cracking and crumbling of the stabilized monolith. This would compromise the remedy, since a much larger surface area of the stabilized contaminated sludge would then be exposed to ground water than there would be if the stabilized monolith were to remain intact. BI shall provide NJDEP with an engineering analysis of whether or not the proposed stabilized sludge will have enough strength to support both parked and turning-around trucks of the type BI anticipates will use this area. If trucks containing a load will be parked and/or turned around in this area, BI shall include fully loaded trucks in this analysis.

2. The RASR for the creek states in Section 3.5 that the incorporation of the "hot spots" from the creek into the stabilized material in the pond may necessitate a "modest" extension of the pond into the canal. This should be more fully explained. How does BI intend to extend the pond into the canal? As stated above, a dam separates the two water bodies.

3. BI states in section 2.3 that they are requiring that the permeability of the stabilized material be no more than $1x10^{-6}$ cm/sec, and that the permeability requirement has been set to "slurry wall" standards to address any residual hydrocarbon contamination. It is assumed that this means that the permeability of the solidified material will be such that residual hydrocarbon material will not be able to penetrate the solidified material. This is important, because there is free product present adjacent to the pond, according to 1993-1995 product thickness data from monitor wells MW-4 and Y9-MW-38, and BI is not proposing to install any type of barrier between the surrounding free product-contaminated aquifer and the pond. It should be noted that NJDEP generally considers a maximum permeability of $1x10^{-7}$ cm/sec to be the standard for "impermeability" (see N.J.A.C. 7:26E-1.8).

4. BI shall explain why they do not propose to replace the wooden bulkheads around the pond with an impermeable barrier wall that would extend into the glacial silt/clay, similar to what they are proposing for the creek.

5. BI shall state whether they still intend to seal off all pipes leading into the pond, as NJDEP was told they would do during our Oct. 21, 1999 site visit.

B. Platty Kill Creek: BI and Exxon Mobil propose to fill the creek with dredge spoil from BI's West Side piers. BI also proposes to hydraulically isolate the creek from shallow ground water and associated contamination and from the downstream water body into which it drains (the KVK) by installing sheet pile around the perimeter of the creek. Before beginning to fill the creek, a new, stronger, anchored sheet pile bulkhead is proposed to be installed just inside the existing sheet pile bulkhead at the mouth of the creek. The proposed depth of installation of this sheet pile bulkhead is not specified. The plan states that free product will be remediated and recovered as practicable as part of site preparation, in accordance with specific plans to be included in the RAW. In addition, obstructions such as pipes, boulders, debris, etc. will have to be removed prior to installing the remaining sheet pile. Hot spots in the creek will be removed and/or treated prior to filling by direct disposal, stabilization or incorporation into the pond remediation (stabilization in the pond), as stated above. The creek is proposed to be filled with dredge spoil from BI's West Side piers. BI proposes augmenting the dredge spoil with material that will enable it to bear light vehicular traffic. Then, the creek will be enclosed with vinyl sheet pile on the three remaining sides. The vinyl sheet pile is proposed to be driven into the red-brown silt/clay layer. BI and Exxon Mobil have yet to verify the presence of this glacial silt/clay beneath the entire creek, as well as its thickness. An inward hydraulic gradient will be maintained by pumping water from the sediments within the sheet pile. The design will include free product recovery from this pumped water. The proposed cap will include a 60 mil HDPE geomembrane installed over a bedding layer on top of the dredge spoil, with a drainage sand layer on top of the HDPE liner and a vegetated soil cover on top. The vegetated cover will be planted with species that will effectively minimize erosion and have roots that will not penetrate below the drainage sand layer. The final cap will be sloped towards the outside of the sheet pile bulkheads on the sides of the creek, and surface runoff is proposed to be captured and directed towards the site stormwater drainage system. The existing steel sheet pile dam (outside of the new steel sheet pile dam) is to be removed. BGWPA understands from the 2/14 email from Larry Baier that you forwarded to the case team that it is uncertain whether or not the filling of the creek with dredge spoil will be permitted under Coastal Zone Management rules.

Comments:

1. BI states in Section 3.7.1.1on pp. 18-19 and Section 5.0 on p. 23 that they will investigate the extent, depth, thickness and hydraulic conductivity of the glacial silt/clay throughout the area beneath the creek in order to prepare the RAW. The plan states that this work will be performed during the review period of the RASR. This silt/clay layer must be present, thick enough and of a low enough hydraulic conductivity to be an effective containment barrier and hydraulically isolate the creek for the proposed remedial action to be implementable. No details or even brief description of this proposed investigation were provided. BGWPA is concerned that the integrity of the silt/clay layer be preserved during the investigation of its thickness. BI shall explain how they will do this. The complete results of this investigation shall be forwarded to NJDEP for review.

2. BI states in Section 3.7.1.1 on p. 18 that the clay underlying the contaminated soils/sludges in the creek is approximately 15 ft. thick. BI shall inform NJDEP of the source of information BI is using for their estimate of the thickness of the clay.

3. BI proposes both vegetating the final cover to prevent erosion and enhancing the dredge spoil fill to be capable of supporting light vehicular traffic. It is likely that vehicular traffic over a sloped, vegetated cover will enhance erosion. BI and Exxon/Mobil shall explain this seemingly contradictory approach to the final use of the filled creek.

4. BI shall inform NJDEP of the depth to which the steel sheet pile at the mouth of the creek will be installed. Is BI proposing to install this sheet pile into the glacial silt/clay unit, similar to what they plan to do with the vinyl sheet piles along the other three sides of the canal?

5. It is noted that Fig. 1, the Site Plan, still indicates that an earthen dam with vinyl sheet pile in the middle is proposed to be constructed at the mouth of the creek, as presented in the Feb. 9, 2000 meeting between BI, Exxon Mobil and NJDEP, instead of a steel sheet pile dam. BI shall explain this discrepancy.

If you have any questions or require any additional information, please do not hesitate to call me at 292-8427.

C: E. Fernandez, BGWPA
G. Czock, BGWPA
J. Boyer, BEERA

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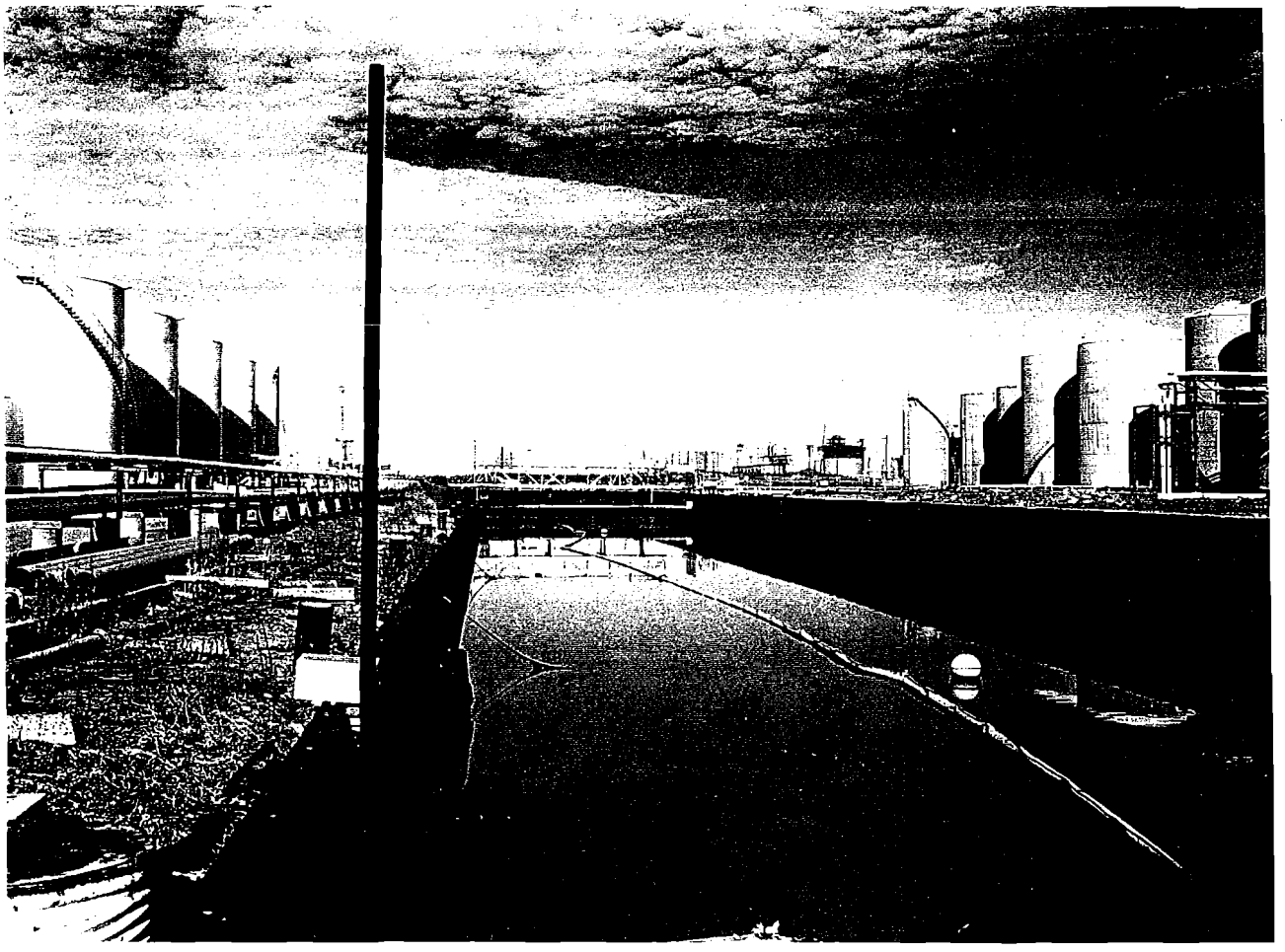

BAYONNE INDUSTRIES, INC.

Bayonne, New Jersey

Platty Kill Canal Phase II Sediment Investigation Report

March 25, 1998

Job #IMT01BYO

CCA000047

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1.0 INTRODUCTION

The work reported here was undertaken to support the efforts of Bayonne Industries, Inc. (BI) and present tenant IMTT-Bayonne to work knowledgeably with neighbor Exxon in planning for the ultimate status of the Platty Kill Canal (canal), an abandoned barge slip. An earlier interest in using the canal as an acceptable site for maintenance dredging soils was determined to be premature, but the investigation was continued given the aforementioned primary purpose of this effort.

On April 2, 1996, ENSR Consulting and Engineering (ENSR), on behalf of BI submitted a Phase 2 Sediment Investigation Workplan for the canal to the New Jersey Department of Environmental Protection (NJDEP), Bureau of State Case Management (BSCM) for review and approval. The plan was developed based on discussions between the NJDEP and Dr. Robert Weaver, Corporate Technical Director, BI, and NJDEP's March 27, 1996 comments to the Platty Kill Creek Interim Remedial Action Report, dated November 1995. The field work was implemented by ENSR and included the collection and analysis of twenty-nine sediment core samples from eleven locations within the canal. These include seven locations in the canal between the sheetpile dam and the bridge at the northern section of the canal; and, four locations north of the bridge toward the Platty Kill Pond. Each sediment core was advanced to the depth of the meadow mat clay.

The objectives of the Phase 2 sediment investigation, supplementing results of the initial Phase I sediment investigation conducted in the fall of 1994, were to:

- Determine the thickness of the sediment/sludge layer in the Platty Kill Canal inside of the sheetpile dam;

- Determine the presence and depth of the meadow mat clay within the Platty Kill Canal;

- Provide a delineation of the contaminated sediment/sludge layer in the canal inside of the sheetpile dam; and,

- Determine the contaminant composition in the sediment/sludge.

The NJDEP, BSCM, conditionally approved the Phase 2 Sediment Investigation Plan on May 9, 1996. The NJDEP's conditional approval of ENSR's plan generally included the following:

- Total Petroleum Hydrocarbon Analysis was to be modified to Method OQA-AQM-025-10/91

- The boring locations were to be surveyed by a New Jersey licensed land surveyor.

- Analytical results were to be compared to Non-Residential Direct Contact Soil Cleanup Criteria and sediment quality guidelines developed by Long E.R., et al. now referenced in N.J.A.C. 7:26E-3.11, a.i.(3).

- Review and comparison of the Exxon data in preparation for a cross section of the Canal was to be included.

The field work was conducted on June 4-7, 1996. This report provides the results of the Phase 2 Canal Sediment Investigation. Section 2 of this report provides background information on the canal and also summarizes the Phase 1 investigation conducted in the Fall of 1994. Section 3 summarizes the actual Phase II field activities, Section 4 provides results, and Section 5 provides findings and conclusions. Section 6 includes recommendations for this Area of Concern (AOC) as identified in the BI MOA executed May 27, 1992.

2.0 BACKGROUND

Bayonne Industries leases to IMTT-Bayonne, a bulk liquids storage facility consisting of several hundred storage tanks containing various grades of petroleum and related products. The site has a 100-year history as a refinery and bulk storage facility. The Kill Van Kull borders the site to the south, while the canal partially borders the site to the east. The Platty Kill Pond is a former on-site surface impoundment which at one time formed the headwaters of the canal. The Platty Kill Pond received stormwater runoff from the facility until May 1978 when a wastewater treatment plant was put into operation at the facility. The Platty Kill Pond is presently separated from the canal by an earthen dam which contains an impermeable liner. The present ownership acquired Bayonne Industries' property in October of 1983.

The canal is an inactive barge slip surrounded by an artificially filled industrial land site. It is approximately 1000 feet in length and is separated from the Kill van Kull by a steel sheetpile dam that was installed in 1991 under permit by the U.S. Corps of Engineers. The sheetpile dam provides a physical barrier spanning the width of the canal and acts as a restraint for sediment migration.

Based on physical boundaries, the Platty Kill Canal was partitioned into three areas for this investigation. The first area is the northern section that includes the area from the earthen dam at the Platty Kill Pond, south to the pipe bridge that spans the canal. The second area is the mid-section that includes the area from the pipe bridge, south to the sheetpile dam at the mouth of the canal. The third area includes the section outside of the sheetpile dam (actually part of the Kill Van Kull).

In the fall of 1994, ENSR conducted a Phase I sediment investigation of the canal as part of the Platty Kill Creek Interim Remedial Action. That investigation included the collection and analysis of sediment samples from 16 locations. The locations included eight outside of the sheetpile dam toward the Kill Van Kull; four inside of the sheetpile dam between the dam and the pipe bridge; and four locations north of the pipe bridge toward the Platty Kill Pond. Those results were reported to the Department in November, 1995 in the report entitled Platty Kill Pond Interim Remedial Action Report Vols. 1 and 2. The

Figures included in this report incorporate data from the 1995 report without repeating discussion or tabulation of those analytical results in this text.

The 1994 Phase I Sediment Investigation analytical results collected by ENSR in the mid-section of the canal indicate that some of the TPH concentrations in the upper zone are at, or slightly above 10,000 ppm; and TPH concentrations in the lower zone (below 4 feet) could exceed 10,000 ppm in the northern reaches (upstream portion) of the canal section near the pipe bridge. Individual organic compound and metals contaminant concentrations in sediment samples collected from this area, in both the upper and lower sediment zones, were previously reported by ENSR in Phase I to be below their respective soil cleanup criteria. ENSR also reported that analytical results from samples collected from the northern section of the canal for TPH in both the upper and lower sediment zones exceeded the 35,000 ppm NJDEP Hazardous Waste Criteria.

The 1994 Phase I Sediment Investigation analytical results collected from outside the sheetpile dam indicate that the total petroleum hydrocarbon (TPH) concentrations in the upper sediment zone (0 to 4 foot depth interval) are below 1,000 ppm; and the TPH concentrations in the lower sediment zone (below 4 feet) are less than 2,500 ppm. ENSR concluded in previous reports that analytical results from select sediment samples collected from outside of the sheetpile dam and analyzed for target compound list (TCL) volatile, semivolatile organic compounds and target analyte list (TAL) inorganics, indicate that all compounds detected were below the NJDEP Impact to Ground Water Soil Cleanup Criteria.

Samples from this most recent investigation are compared herein to Soil Cleanup Criteria and sediment criteria cited in the NJDEP letter (Long E.R., Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estarine Sediments) dated March 27, 1996 and now referenced as guidance in N.J.A.C. 7:26E.

Comparison of sediment analysis to these criteria is not intended to imply that they have been deemed appropriate as corrective action criteria but rather that they serve as an available benchmark to screen potential impacts or adverse ecological effects. At this time the results reported serve as a basis for

evaluating alternative remedial strategies that may be appropriate for this AOC which recognizes that the sediments in the canal are well confined behind the dam.

3.0 SUMMARY OF FIELD ACTIVITIES

ENSR collected sediment samples from eleven locations inside of the sheetpile dam in June of 1996. At each location, sediment was advanced to the core depth of the meadow mat or until the core met refusal, whichever was encountered first. For each 20 foot core, ENSR collected one sediment sample nominally for every five foot depth interval (with a maximum of 3 per core). Each sample collected was analyzed for Total Petroleum Hydrocarbons (TPH). At six of the sediment core locations, each of the sediment samples collected were also analyzed for Target Compound List (TCL) volatile and semi-volatile compounds, Target Analyte List (TAL) metals, PCB and pesticide compounds.

One core, Y9-PKC-SED-22 was not collected due to refusal at that location. Seven sediment cores were collected from the mid-section of the Platty Kill Canal inside of the sheetpile dam and south of the pipe bridge that spans the canal. Four sediment cores were collected from the area of the Platty Kill Canal on the northern side of the pipe bridge toward the Platty Kill Pond. Figure 1 provides the sediment core locations and associated cross sections.

Each of the sediment cores were collected using a portable vibratory corer mounted on a 22-foot motorized pontoon work platform. Twenty-nine samples plus QA/QC samples were submitted for laboratory analysis. The following procedure was followed to ensure that reliable and representative sediment samples were collected for analysis.

3.1 Sediment Sampling

Prior to initiating the sampling activity, all work areas (where practical), such as the floor of the work platform and the core extrusion/sampling area, were covered with plastic sheeting and all sampling equipment (core tubes, etc.) were steam cleaned. All field team members handling the sediment cores or the sediment corer were in modified level D protection. A core extrusion/sampling station was established in a central location onshore. A crane placed the work platform in the desired area within the canal. Once the work platform had been placed in the water, it was moved to the selected sampling location and the position was stabilized for coring.

A vibratory corer (AScI Model P-3) fitted with a lexon core tube was lowered into the water until the core sampling tube was located at the water-sediment interface. Once at the interface, the vibratory coring process commenced and continued until a full 20-foot core length of penetration was achieved, or refusal was reached (which was assumed to be at the meadow mat). Upon completion of the coring, the vibratory core was removed from the water and the tube ends were capped. Due to anticipated hole collapse, it was assumed that subaqueous grouting of the coring hole was not required. The work platform was then moved to shore and the core tube was transferred to field personnel at the onshore sample extrusion/sampling station. The core tube was cut lengthwise into two halves using a hand-held electric clipper. The shallow blade of the clipper permitted that only the lexon core tube was cut, yielding very little disturbance to the sediment core. After opening the core tube the sediment core was screened with an organic vapor analyzer, the core was logged and photo-documented, and then sampled.

A maximum of three samples were collected from each sediment core. The samples were composited for each 5-foot depth interval. The volatile organic fraction sample from each specified depth interval was collected using a stainless steel trowel. The remainder of the sample from each selected depth interval was transferred to a decontaminated, stainless steel bowl and homogenized, and then transferred to the appropriate sample jar for the remaining analytical fractions. To prevent cross-contamination, the laboratory cleaned sample containers remained sealed until the sample had been removed from the corer and homogenized. The sampler wore a new pair of disposable latex gloves for each sample collected. After a sufficient amount of sample had been placed in the container, the container was sealed and placed in a cooler that was kept at 4°C until final receipt at the laboratory. This procedure was repeated for each sediment core location. The sample containers were labeled in accordance with the procedures specified in the Sediment Investigation Work Plan. The coolers containing the samples and the chain-of-custodies were shipped from the site daily.

Each sample shipment was accompanied by a COC record from the time of collection until analysis was performed. The cooler containing the samples were custody sealed, and the COC accompanied the sample bottles during transportation to the field, sample collection, transportation to the laboratory, and analysis. When transferring the possession of samples, the individuals relinquishing and

receiving signed, dated, and noted the time on the record. This record documented sample custody transfer from the sampler, often through another person, to the Laboratory Sample Custodian.

Each shipping container was accompanied by the COC record identifying its contents. The back copy(s) of the COC record were detached and kept with the field notebook for subsequent placement into the ENSR project file following Project Management review; the original record accompanied the shipment. When under COC, sample bottles were secured in a locked vehicle or custody sealed in a shuttle when not in the presence of authorized personnel. Upon sample receipt, the Laboratory Sample Custodian logged the samples in, indicated the condition of each sample as received, and explicitly stated whether the COC seal was intact.

Table 1 provides the sample identification, analytical requirements and analytical methods for the sediment sampling program. All twenty-nine samples collected were analyzed for total petroleum hydrocarbons. Samples collected from six of the sediment core locations (four from the mid-section and two from the northern section) were also analyzed for TCL organics, pesticide/PCBs, and TAL inorganics. All samples were submitted for analysis to Industrial Environmental Analysts, Inc. (IEA), Whippany, New Jersey, Certification Number 14530. Laboratory deliverables complied with 10% full laboratory deliverable and 90% reduced laboratory deliverable reporting requirements specified in the NJDEP proposed Technical Requirements for Site Remediation.

Environmental duplicate samples were collected at a frequency of one per twenty samples. Field blanks were collected at a frequency of one per day. Each QA/QC sample was analyzed for the same parameters as the sediment samples. Since no aqueous samples were collected, no trip blanks were collected or analyzed.

Following sampling of each core, all sampling equipment to be reused was decontaminated in accordance with the procedures specified in the NJDEP FSPM. The plastic covering was replaced for the work surface at the sampling station to avoid possible cross-contamination.

The excess sediment not used during sampling was temporarily placed on plastic sheeting. Following the completion of the sediment sampling program, the sediment was disposed of directly back into the Platty Kill Canal.

3.2 Surveying

All sediment sample locations were marked with weighted buoys for surveying. At the conclusion of the sediment sampling program, all sampling locations were surveyed by a certified Professional Land Surveyor, J. Peter Borbas, PLS, Boonton, New Jersey. Elevations for each location were obtained by recording the depth to water, at the time of sampling, from a fixed location on the Platty Kill Canal (a surveyed Stevens Recorder), then, by subtracting the depth to water at each location, recorded at the time of sampling, the elevation of the water/sediment interface was obtained.

4.0 RESULTS

From June 4 to 7, 1996, eleven shallow sediment cores (Y9-PKC-SED-17 through Y9-PKC-SED-28 on Table 1) were collected from the bed of Platty Kill Canal using a floating platform mounted vibracoring device. Seven cores were collected from inside the sheetpile dam and four were collected north of the pipe bridge. Figure 1 provides the sediment core locations. For each core location, one lexon core tube was driven between 6 and 14.5 feet into the canal bed. Upon extrusion of the sediment core from the tube, the sediments were characterized and up to three sediment samples were collected for analysis.

4.1 Stratigraphic Characterization - Platty Kill Canal

The ENSR Phase 2 sediment core logs are provided in Appendix A. The Phase 1 sediment core logs are provided in Appendix B, Exxon monitoring well logs are included in Appendix C. In reference to Appendices A and B, the sediments observed in the Platty Kill Canal primarily consist of thin deposits of black silt and clay overlying coarser sediments (i.e., sand and gravel, sand-silt-clay mixtures and meadow mat clay) with clay underlying the length of the canal. In general, the highest photoionization detector (PID) readings (100 to 130 ppm) were observed at depths greater than 5 feet.

The sediment boring logs from this sediment investigation and the previous Phase I investigation conducted in the fall of 1994, along with boring logs from BI and Exxon monitoring wells installed on both sides of the Platty Kill Canal were used to generate stratigraphic cross sections of the canal and surrounding area. These cross-sections are presented on Figure 1. All soil boring and sediment core elevations are referenced to mean sea level.

Cross Section A-A' identifies the stratigraphic units from the pipe bridge spanning the canal to the sheetpile dam at the mouth of the Platty Kill Canal. The sheetpile dam is a physical barrier spanning the width of the canal and acting as a restraint to sediment migration.

Cross Section B-B' identifies the stratigraphic units in the northernmost portion of the Platty Kill Canal, from the earthen dam at the Platty Kill Pond to the pipe bridge spanning the canal.

Cross Section C-C' identifies the stratigraphic units across the center of the Platty Kill Canal, just north of the bridge and tied into Exxon's soil borings PKMW-13 and PKMW-6. The bed of the Platty Kill Canal at the time of the sampling program was found to occur between 3 and 7 feet below mean sea level. The canal bed topographically slopes towards the Kill Van Kull.

In reference to Cross Section B-B', a silt unit (with varying amounts of clay), approximately 5 to 8.5 feet thick, conformably overlies a unit of silt and clay, with organic fibers, in the northernmost part of the Platty Kill Canal. This represents silt filling up naturally over the meadow mat clay previously identified in other locations throughout the site.

In the northern and central portions of the Platty Kill Canal, Cross Section A-A', the silt and clay unit occurs comformably from the top of the canal bed to approximately 2.5 to 11 feet below the bed surface. Underlying the silt and clay unit, a silt and clay unit with varying amounts of coarse sand and gravel, several feet thick, was observed south of Y9-PKC-SED-19. Below this layer is a silt and clay layer, that appears to underlie the entire Platty Kill Canal.

As shown on Cross Section C-C', a red/brown silt unit also occurs beneath the entire Platty Kill Canal, occurring approximately 20 to 25 feet below mean sea level.

4.2 Chemical Analysis

A total of twenty-nine sediment samples were collected for analysis of total petroleum hydrocarbons (TPH); a maximum of three were collected from each sediment core along with two duplicate samples. In addition, twenty of these samples, including the two duplicate samples, were further analyzed for target compound list (TCL) volatile and semi-volatile organic compounds, pesticides/PCBs, and target analyte list (TAL) inorganics. All samples were submitted for chemical analysis to IEA Laboratories, Whippany, New Jersey laboratory certification #14530.

Table 2 provides a summary of TPH concentrations for each sediment sample collected. Table 3 provides a summary of the analytical results for volatile and semi-volatile organic compounds, inorganic compounds, pesticides and PCBs. The summary table compares the analytical results to NJDEP's NRDCSCC (NJAC 7:26D) and sediment criteria compiled by Long et. al. Given the variation between the two, specific comparison is presented in tabular form only including the data and both criteria.

The laboratory analytical results were validated by ENSR's validation group in Acton, Massachusetts. The analytical results were found to be valid and may be used for decision making purposes. Appendix D provides the validated analytical summary pages for the sediment sampling program. A copy of the IEA analytical report packages for the sediment investigation have been submitted as Appendix E.

To aid in the evaluation of the analytical results, the sediments were divided into three depth intervals. The upper zone which includes the zone from the top of the canal bed to a depth of five feet; a middle zone which includes the interval from five feet to 10 feet, and the lower zone which includes the sediment interval greater than ten feet. The upper, middle, and lower zone are discussed separately in the following sections.

For evaluation and presentation purposes, analytical results have been separated into the following groups: total petroleum hydrocarbons (TPH); total benzene, toluene, ethylbenzene and xylenes (BTEX); total semi-volatile organic compounds (SVOC), and metals.

4.2.1 Platty Kill Canal Upper Sediment Zone (0 to 5 Feet)

Total petroleum hydrocarbons in the upper sediment zone were detected in all eleven samples collected from this zone, at concentrations ranging from 4,000 ppm (Y9-PKC-SED-17A) to 180,000 ppm (Y9-PKC-SED-21C). The TPH concentrations in the upper sediment zone have been plotted and contoured on Figure 2. This map incorporates results from both sediment investigation phases. As shown on Figure 2, the highest TPH concentrations occur in the northern portion of the Platty Kill Canal. The

(Y9-PKC-SED-21C). The TPH concentrations in the upper sediment zone have been plotted and contoured on Figure 2. This map incorporates results from both sediment investigation phases. As shown on Figure 2, the highest TPH concentrations occur in the northern portion of the Platty Kill Canal. The isoconcentration lines shown on Figure 2 depict a TPH concentration gradient which decreases towards the mouth of the Platty Kill Canal.

Six of the samples from the sediment cores (Y9-PKC-SED-17A, -19A, -21A, -23A, -25A, and -27A) were further analyzed for TCL volatile and semi-volatile organic compounds. Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) were detected in five of the sediment core samples (Y9-PKC-SED-17A, -19A, -21A, -23A, and -27A) with concentrations ranging from 0.22 ppm (Y9-PKC-SED-19A) to 49 ppm (Y9-PKC-SED-27A). Chlorobenzene and tentatively identified compounds (TICs) were the only other volatile organic compounds detected in the six samples submitted for VOC analysis. Figure 3 provides an isoconcentration map of BTEX concentrations in the upper sediment zone. At sample location Y2-PKC-SED-25A, BTEX was not detected in the upper sediment zone. BTEX concentrations that are greater than 45 ppm remain in the northern reaches of the canal. Based on the isoconcentration maps, there is good correlation in terms of the BTEX and TPH concentration distribution in the sediment.

Semi-volatile compounds (SVOC) were detected in all six sediment cores, with total SVOC concentrations ranging from 55.1 ppm (Y9-PKC-SED-22A) to 1075.3 ppm (Y9-PKC-SED-21A). Of the SVOC detected in these sediment cores, polyaromatic hydrocarbon compounds (PAHs) make up a significant portion of the SVOCs detected. Total PAH concentrations range from 24.2 ppm (Y9-PKC-SED-19A) to 713 ppm (Y9-PKC-SED-21A). The SVOC concentrations in the upper sediment zone have been plotted and contoured on Figure 4. The highest SVOC concentrations occur in the central portion of the Platty Kill Canal. The SVOC concentration gradient decreases steeply towards the mouth of the Platty Kill Canal. As with the BTEX concentrations, the distribution of SVOC concentrations in the sediment display a good correlation with the TPH concentrations.

Residual pesticide concentrations were detected in the samples collected from this upper zone as provided in Table 3. No PCBs were detected above their respective laboratory quantitation limits in any of the samples collected from the upper zone.

Total metal concentrations of the sediments are included on Table 3. These results represent the concentration of selected metals in the sediment and no evaluation has been conducted of leaching potential or background conditions in the area.

Of the metals detected in the sediment, arsenic and lead were the most significant in terms of concentrations. The highest lead, zinc, and arsenic concentrations in the upper sediment zone were detected in the northern most portion of the canal at sediment core location Y9-PKC-SED-25A at the turn in the canal. In general, the concentrations at this location were at least one order of magnitude higher than that of the other sediment sample locations. Inside of the sheetpile dam, lead concentrations ranged from 554 ppm to 11,600 ppm; arsenic concentrations ranged from 29.5 ppm to 629 ppm; Zinc concentrations ranged from 713 ppm to 1,530 ppm. These are representative of total metal concentrations found in the sediments and do not represent leachate potential.

4.2.2 Platty Kill Canal Middle Sediment Zone (5 to 10 feet)

Total petroleum hydrocarbons were detected in all eleven samples collected from the middle sediment zone, with concentrations ranging from 24,000 ppm (Y9-PKC-SED-28B) to 160,000 ppm (Y9-PKC-SED-27B). The TPH concentrations in the middle sediment zone have been plotted and contoured on Figure 2. This map incorporates results from both sediment investigation phases. As shown on Figure 2, similar to the TPH distribution in the upper zone, the highest TPH concentrations in the middle zone occur in the northern portion of the Platty Kill Canal. The isoconcentration lines shown on Figure 2 depict a TPH concentration gradient which decreases towards the mouth of the Platty Kill Canal.

Six of the samples from the sediment cores (Y9-PKC-SED-17B, -19B, -21B, -23B, -25B, and -27B) were further analyzed for TCL volatile and semi-volatile organic compounds. BTEX compounds were detected in five of the sediment core samples (Y9-PKC-SED-17B, -19B, -21B, -23B, and -27B) with concentrations ranging from 27 ppm (Y9-PKC-SED-19B) to 617 ppm (Y9-PKC-SED-23B). BTEX compounds were not detected in sample Y9-PKC-SED-25B. Chlorobenzene was the only other volatile organic compound detected in the six samples submitted for VOC analysis. Figure 3 provides an

from both sediment investigation phases. Based on the BTEX isoconcentration map, BTEX concentrations appear to decrease south of sediment sample Y9-PKC-SED-17B. The BTEX and TPH concentration distribution in the sediment displays a good correlation.

SVOC (including TICs) were detected in all six sediment core samples collected from the middle sediment zone, with total SVOC concentrations ranging from 516.4 ppm (Y9-PKC-SED-19B) to 3038.2 ppm (Y9-PKC-SED-27B). The SVOC concentrations in the middle sediment zone have been plotted and contoured on Figure 4. These maps incorporate results from both sediment investigation phases. The highest SVOC concentrations in the middle sediment zone occur in two separate areas within the Platty Kill Canal. The PAH and SVOC concentration gradient decreases steeply towards the mouth of the Platty Kill Canal. The concentration distribution of SVOC and the PAH in the middle sediment zone display a good correlation with the TPH results.

Some residual pesticide concentrations were detected in the samples collected from this middle zone and are provided in Table 3 with associated criteria. No PCBs were detected above their respective laboratory quantitation limits in any of the samples collected from the middle zone.

Of the total metals detected in the sediment, arsenic and lead were the most significant in terms of concentrations. These results represent total metals found in the sediment matrix. The highest lead and arsenic in the middle sediment zone were detected in the northern most portion of the canal at sediment core location Y9-PKC-SED-25B. In general, the concentrations at this location were at least one order of magnitude higher than that of the other sediment sample locations. Inside of the sheetpile dam, lead concentrations in the upper sediment zone ranged from 844 ppm to 4860 ppm; arsenic concentrations ranged from 54.4 ppm to 131 ppm.

4.2.3 Platty Kill Canal Lower Sediment Zone (10 to 15 feet)

Total petroleum hydrocarbons were detected in all seven samples collected from the lower sediment zone, with concentrations ranging from 24,000 ppm (Y9-PKC-SED-17C) to 180,000 ppm (Y9-PKC-SED-21C). The TPH concentrations in the lower sediment zone have been plotted and contoured on Figure 2.

Five of the samples from the sediment cores (Y9-PKC-SED-17C, -19C, -21C, -23C, and -27C) were further analyzed for TCL volatile and semi-volatile organic compounds. BTEX compounds were detected in all five of the sediment core samples with concentrations ranging from 152 ppm (Y9-PKC-SED-17C) to 413 ppm (Y9-PKC-SED-27C). Chlorobenzene was the only other volatile organic compound detected in the seven samples submitted for VOC analysis. Figure 3 provides an isoconcentration map of BTEX concentrations in the lower sediment zone. Based on the BTEX isoconcentration map, BTEX concentrations appear fairly uniform in the lower zone.

SVOC were detected in all five sediment core samples collected from the lower sediment zone, with total SVOC concentrations ranging from 1644.9 ppm (Y9-PKC-SED-17C) to 2534.1 ppm (Y9-PKC-SED-19C). The SVOC concentrations in the lower sediment zone have been plotted and contoured on Figure 4. The highest SVOC concentrations in the lower sediment zone occur in two separate areas within the Platty Kill Canal. The SVOC concentration gradient decreases steeply towards the mouth of the Platty Kill Canal. The concentration distribution of SVOC in the lower sediment zone display a good correlation with the TPH results.

Some residual pesticide concentrations were detected in the samples collected from this lower zone and are provided in Table 3 with their associated criteria. No PCBs were detected above their respective laboratory quantitation limits in any of the samples collected from the lower zone.

Of the metals detected in the sediment samples collected from the lower zone, arsenic and lead were the most significant in terms of concentrations. Again, these represent the total metal concentration found in the sediments. The highest lead and arsenic in the lower sediment zone were detected in the northern

concentrations in the lower sediment zone ranged from 1,120 ppm to 3,020 ppm; arsenic concentrations ranged from 80.6 ppm to 282 ppm.

4.2.4 Comparison of Results to Criteria

As per the Department's May 9, 1996 conditional approval letter, BI has developed a comparison to both the NJDEP Soil Cleanup Criteria and the criteria presented in Long, E.R., and D.D. MacDonald, S.L. Smith and F.D. Calder, Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments, Environmental Management 19:81-97, 1995.

In the upper sediment zone (0-5 feet), 15 out of 29 sediment samples collected from the canal exhibited TPH concentrations above 10,000 ppm. These were all located in the northern portion of the canal, between the earthen dam at the Platty Kill Pond and the approximate mid-point of the canal (in the vicinity of sediment core locations Y9-PKC-05 and -06). In the middle sediment zone (5-10 feet), 17 out of the total 29 sediment samples collected exhibited TPH concentrations above 10,000 ppm. These are all located in the northern reaches of the canal, from the earthen dam to a point approximately midway between the pipe bridge that spans the canal and the sheetpile dam at the mouth of the canal (in the vicinity of core sample locations Y9-PKC-05 and -06). All TPH concentrations in sediment samples (seven total) collected from the lower sediment zone (greater than 10 feet) exceeded 10,000 ppm TPH. No sediment samples were collected from the lower zone during the Phase 1 sediment investigation. All sediment samples previously collected from outside the sheetpile dam, both in the upper and middle sediment zones, exhibited TPH concentrations below 4,500 ppm. During the Phase 2 sediment investigation, no samples were collected from outside the sheetpile dam.

Selected sediment cores were submitted for volatile and semi-volatile organic compound, pesticide/PCB and metals analysis. Eight sediment cores (Y9-PKC-SED-01, -06, -17, -19, -21, -23, -25, and -27) displayed volatile organic concentrations including benzene (13 ppm), total xylenes (1000 ppm) and chlorobenzene (680 ppm). Four semi-volatile organic compounds, naphthalene, acenaphthalene, fluorene, and dietnylphthalate, were detected in the middle and/or lower sediment zone at core locations Y9-PKC-SED-17, -19, -23, -25, and -27.

Concerning the metal detections within the sediment cores, the variation between the Soil Cleanup Criteria and the Long criteria is significant for some metals. As such the most informative approach to evaluating these compounds is by review of Table 3.

4.2.5 Comparison of Results to Exxon Data

As requested in the May 9, 1996 NJDEP conditional approval letter, a comparison has been made of the data collected by ENSR to the data presented in the Exxon Bayonne Site Remediation Report prepared by Dan Raviv Associates Inc. (DRA) dated December 14, 1994.

In general, DRA reports finding "sludge" in the canal to a depth of approximately -20 feet below mean sea level (bmsl). This is in contrast to ENSR's specific characterization of the same material as clay, silt, sand and gravel. The difference is likely based on sample collection methodology. The vibracore methodology, used and explained in Section 3.1 of this report, provided for a more detailed logging of sediments by ENSR. DRA collected "four over water borings" completed by driving four-inch diameter steel casing into the sediments then used a split-spoon sampler to collect sediments from inside the 4-inch pipe. A second set of three samples were collected by DRA from a boat, with a hand auger, to a maximum depth of four feet into the sediment. All of these samples were apparently disturbed during these processes, not allowing for the detail ENSR was able to provide.

Land based geologic conditions defined by DRA on the eastern side of the PKC have been incorporated into Figure 1 along with Geologic conditions defined by ENSR on the west side. The two compare favorably, with the most significant difference being the presence of free product found in the soil by DRA on the Exxon property. This finding was based on well installations showing significant quantities of free product.

Further review of the DRA report leaves open several questions associated with the source for the PKC sediment contamination. The statement by DRA that free product is not migrating into the PKC past the Exxon bulkhead from a depth of some 15 to 20 feet bmsl appears questionable given the observations in Figure 4 of the same DRA report that boring B-9, located in the canal, has what is defined in the legend of the figure as a "discontinuous layers of petroleum impacted soil in the confined zone." To eliminate

migration of contaminants from these soils to the canal, any confining layer would need to be continuous, extending the canals entire length. DRA has not addressed the actual permeability of what they classified as sludge in the area of borings B-9, B-10, B-11 and B-12 shown on Figure 4 of the DRA Report.

The DRA Report further proposes that "overall the flow of water from the deep zone to the canal occurs less than 50% of the time". This might suggest that product can not flow out of the confining zone into the canal. However, no mechanism is proposed (such as on-shore pumping from a confining unit) to support a hypothesis that is contrary to natural discharge of ground water towards the ocean. In addition, conductivity measurements taken of water during the pumping test by DRA from PKMW-12 and PKMW-13 were found to be consistent with ground water rather than canal water. DRA further reports in Section 5.3.3 "... the conductivity of the ground water in wells PKMW-12 and PKMW-13 did not increase (during the pumping test) as would be expected if there was recharge from the canal." This would reinforce the expectation that the confined unit does discharge to the canal.

Overall, the statement that the bulkhead and confining unit are preventing impacts from the west side of the canal is not really supported and the prospective source of continuing contamination should be addressed further prior to any remedial action in the canal.

5.0 FINDINGS

Based on the results of the Phase 1 and Phase 2 sediment investigations conducted on the Platty Kill Canal, the following can be generally concluded:

1. Stratigraphic and analytical data indicate that the sheetpile dam effectively restrains sediment migration down stream in the canal and therefor protects potential ecological receptors just outside the dam and in the Kill Van Kull.

2. Analytical results from samples previously collected from outside the sheetpile dam indicate that the TPH concentrations in the upper sediment zone (0 to 4 foot depth interval) are below 1,000 ppm; and the TPH concentrations in the lower sediment zone (below 4 feet) are less than 2,500 ppm.

3. TPH concentrations within the sheetpile dam and in the northern reaches of the canal generally exceed the 10,000 ppm total organic compounds. In general, these TPH concentrations in both the upper and middle zones are located in the northern portion of the canal. At the approximate mid-point of the canal, the TPH concentrations decrease significantly to concentrations below 10,000 ppm.

4. Specific criteria, presented by Long et. al., have been exceeded for both organic and inorganic compounds and as such further planning for closure of this AOC is warranted.

5. A silt unit (with varying amounts of clay), approximately 5 to 8.5 feet thick, conformably overlies a unit of silt and clay meadow mat with organic fibers, in the northernmost part of the Platty Kill Canal. In the central and southern portions of the Platty Kill Canal, the silt and clay unit occurs comformably from the top of the canal bed to approximately 2.5 to 11 feet below the bed surface. Below this layer is a silt and clay layer, with some organic fibers, that appears to underlie the entire Platty Kill Canal. A red/brown silt unit occurs

beneath the entire Platty Kill Canal, occurring approximately 20 to 25 feet below mean sea level. Testing of clay units during the site wide investigation indicated permeability ranges on the order of 10^{-7} cm/sec.

6. Although the TPH concentrations are relatively high, individual VOC and SVOC concentrations are low, with very few exceedances of their respective NJDEP soil criteria. Most exceedances noted are within one order of magnitude or less of the respective criteria. Detected VOCs in the sediments are limited to BTEX compounds and chlorobenzene.

7. No PCBs were detected in any of the sediment samples at concentrations above their respective laboratory quantitation limits. Some residual pesticides were detected at limited concentrations.

8. Arsenic and lead are among the metals present in the sediments and appear to be the inorganic compounds requiring consideration and further evaluation. Total metal concentrations of the sediments are included on Table 3. These results represent the concentration of selected metals in the sediment and no evaluation has been conducted of leaching potential or background conditions in the area.

9. A potential source has been identified on the Exxon side of the PKC for product to migrate into the PKC. The only barrier between significant product from discharging directly into the canal is a wooden bulkhead installed in 1953.

6.0 RECOMMENDATIONS

No further sediment investigatory work is recommended at this time due to the ongoing investigation and closure strategy being developed for the Platty Kill Pond. The area that now includes the Platty Kill Pond and a portion of the Exxon facility, at one time incorporated the headwaters of the canal. The approved approach for closure of the Platty Kill Pond will provide information and experience crucial to developing appropriate closure for the canal. During a future phase of the MOA program, a Remedial Action Workplan will be developed for closure of this Area of Concern.

7.0 CERTIFICATION

I certify under penalty of law that the information producted in this document is true, accurate and complete to the best of my knowledge. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Robert C. Weaver
Vice President, Technical Director

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Robert C. Weaver
Vice President, Technical Director

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Volume II of II, Appendices, Non-Aqueous Phase Liquid (NAPL), Interim Remedial Measures Investigation, Platty Kill Canal Area, Exxon Bayonne Plant, Bayonne, New Jersey, DRAI Job No. 93C1295, December 14, 1994

Responses to NJDEP's Comments on the NAPL IRM Report and Addendum to the NAPL IRM Investigation Well PKMW16, The Platty Kill Canal Area, Former Exxon Bayonne Terminal, DRAI Job No. 93C1295, June 4, 1996

TABLE 1: SAMPLE IDENTIFICATION, ANALYTICAL REQUIREMENTS AND ANALYTICAL METHODS FOR SEDIMENT SAMPLING PROGRAM
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

SAMPLE ID NUMBER	ANALYTICAL PARAMETERS
Y9-PKC-SED-17A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-17B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-17C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-18A	TPH
Y9-PKC-SED-18B	TPH
Y9-PKC-SED-19A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-19B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-19C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-19D (DUP)	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-20A	TPH
Y9-PKC-SED-20B	TPH
Y9-PKC-SED-20C	TPH
Y9-PKC-SED-21A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-21B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-21C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-23A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-23B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-23C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-24A	TPH
Y9-PKC-SED-24B	TPH
Y9-PKC-SED-25A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-25B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-26A	TPH

TABLE 1: SAMPLE IDENTIFICATION, ANALYTICAL REQUIREMENTS AND ANALYTICAL METHODS FOR SEDIMENT SAMPLING PROGRAM
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

SAMPLE ID NUMBER	ANALYTICAL PARAMETERS
Y9-PKC-SED-26B	TPH
Y9-PKC-SED-26C	TPH
Y9-PKC-SED-27A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-27B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-27C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-28A	TPH
Y9-PKC-SED-28B	TPH

TPH - Total Petroleum Hydrocarbons - EPA Method OQA-QAM-025-10/91
TCL - Target Compound List Organics - EPA Method 3550/8240/8270
TAL - Target Analyte List Inorganics - EPA Method 3050/6010/7000
PCBs/Pesticides - EPA Method 8080
Y9-PKC-SED-19D is a duplicate of Y9-PKC-SED-19B

Reference No.: 3782-009(4)/SEDSAMP.TBL

TABLE 2: SUMMARY OF TOTAL PETROLEUM HYDROCARBON ANALYTICAL RESULTS
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industaries, Inc.
Bayonne, New Jersey

DEPTH	0-5 ft. A	5-10 ft. B	10-15 ft. C
SAMPLE #	Total Petroleum Hydrocarbons		
PKCSED-17	4000 J	100,000 J	24,000 J
PKCSED-18	39,000	55,000	
PKCSED-19	19,000 J	32,000 J	110,000 J
PKCSED-20	46,000	39,000	91,000
PKCSED-21	110,000 J	57,000 J	180,000 J
PKCSED-23	110,000 J	120,000 J	80,000 J
PKCSED-24	90,000	120,000	
PKCSED-25	170,000	66,000	
PKCSED-26	71,000	100,000	160,000
PKCSED-27	88,000	160,000	95,000
PKCSED-28	170,000	24,000	

Notes: All results expressed in parts per million.
J = Estimated Value.

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED17A 62372013 06/06/96 SLUDGE		PKCSED17B 62372014 06/06/96 SLUDGE		PKCSED17C 62372015 06/06/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	**UNITS**										
VOLATILES											
Chloromethane	UG/KG	3400	U	6800	U	15000	U	1000000	10000		
Bromomethane	UG/KG	3400	U	6800	U	15000	U	1000000	1000		
Vinyl Chloride	UG/KG	3400	U	6800	U	15000	U	7000	10000		
Chloroethane	UG/KG	3400	U	6800	U	15000	U				
Methylene Chloride	UG/KG	1800	U	3500	U	7800	U	210000	1000		
Acetone	UG/KG	3400	U	6800	U	15000	U	1000000	100000		
Carbon Disulfide	UG/KG	1800	U	3500	U	7800	U				
1,1-Dichloroethene	UG/KG	1800	U	3500	U	7800	U	150000	10000		
1,1-Dichloroethane	UG/KG	1800	U	3500	U	7800	U	1000000	1000		
1,2-Dichloroethene(total)	UG/KG	1800	U	3500	U	7800	U		50000		
Chloroform	UG/KG	1800	U	3500	U	7800	U	28000	1000		
1,2-Dichloroethane	UG/KG	1800	U	3500	U	7800	U	24000	1000		
2-Butanone	UG/KG	3400	U	6800	U	15000	U	1000000	50000		
1,1,1-Trichloroethane	UG/KG	1800	U	3500	U	7800	U	1000000	50000		
Carbon Tetrachloride	UG/KG	1800	U	3500	U	7800	U	4000	1000		
Bromodichloromethane	UG/KG	1800	U	3500	U	7800	U	46000	1000		
1,2-Dichloropropane	UG/KG	1800	U	3500	U	7800	U	43000			
cis-1,3-Dichloropropene	UG/KG	1800	U	3500	U	7800	U	5000	1000		
Trichloroethene	UG/KG	1800	U	3500	U	7800	U	54000	1000		
Dibromochloromethane	UG/KG	1800	U	3500	U	7800	U	1000000	1000		
1,1,2-Trichloroethane	UG/KG	1800	U	3500	U	7800	U	420000	1000		
Benzene	UG/KG	1800	U	3500	U	7800	U	13000	1000		
Trans-1,3-Dichloropropene	UG/KG	1800	U	3500	U	7800	U	5000			
Bromoform	UG/KG	1800	U	3500	U	7800	U	370000	1000		
4-Methyl-2-Pentanone	UG/KG	3400	U	6800	U	15000	U	1000000	50000		

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED17A 62372013 06/06/96 SLUDGE		PKCSED17B 62372014 06/06/96 SLUDGE		PKCSED17C 62372015 06/06/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	**UNITS**										
2-Hexanone	UG/KG	3400	U	6800	U	15000	U				
Tetrachloroethene	UG/KG	1800	U	3500	U	7800	U	6000			
Toluene	UG/KG	1800	U	3500	U	12000		1000000	500000		
1,1,2,2-Tetrachloroethane	UG/KG	1800	U	3500	U	7800	U	70000	1000		
Chlorobenzene	UG/KG	6000		3500	U	7800	U	680000	1000		
Ethylbenzene	UG/KG	3800		29000		20000		1000000	100000		
Styrene	UG/KG	1800	U	3500	U	7800	U	97000	100000		
Total Xylenes	UG/KG	4300		190000		120000		1000000	10000		
VOLATILE TICS											
Cyclohexane, 1,2-Dimethyl-, Trans-	UG/KG			170000	JN						
Cyclohexane, Methyl-	UG/KG	46000	JN	860000	JN						
Unknown Cycloalkane	UG/KG	18000	J	460000	J	190000	J				
1h-Indene,Dihydro-Methyl Isomer	UG/KG										
Ethyl Dimethyl Benzene Isomer	UG/KG	24000	J	240000	J						
Ethylmethyl Benzene Isomer	UG/KG	18000	J	200000	J	160000	J				
Unknown Alkane	UG/KG	92000	J	240000	J	400000	J				
Methyl Propyl Benzene Isomer	UG/KG										
Trimethyl Benzene Isomer	UG/KG			110000	J						
1h-Indene,Dihydro-Dimethyl Isomer	UG/KG										
Methyl Naphthalene Isomer	UG/KG	18000	J								
Naphthalene	UG/KG	18000	J	190000		54000		4200000		160	2100
Cyclohexane, 1-Ethyl-2-Methyl-, Cis-(8c	UG/KG	5400	J			280000	J N				
Pentalene, Octahydro-2-Methyl-	UG/KG										
Diethyl Benzene Isomer	UG/KG										
Methyl Methylethyl Benzene Isomer	UG/KG	20000	J								

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED17A 62372013 06/06/96 SLUDGE		PKCSED17B 62372014 06/06/96 SLUDGE		PKCSED17C 62372015 06/06/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	**UNITS**										
Unknown Aromatic	UG/KG					230000	J				
SEMI-VOLATILES											
Phenol	UG/KG	28000	U	28000	U	25000	U	10000000	50000		
Bis(2-Chloroethyl)Ether	UG/KG	28000	U	28000	U	25000	U	3000	10000		
2-Chlorophenol	UG/KG	28000	U	28000	U	25000	U	5200000	10000		
1,3-Dichlorobenzene	UG/KG	28000	U	28000	U	25000	U	10000000	100000		
1,4-Dichlorobenzene	UG/KG	28000	U	28000	U	25000	U	10000000	100000		
1,2-Dichlorobenzene	UG/KG	28000	U	28000	U	25000	U	10000000	50000		
2-Methylphenol	UG/KG	28000	U	28000	U	25000	U	10000000			
2,2'-Oxybis(1-Chloropropane)	UG/KG	28000	U	28000	U	25000	U	10000000			
4-Methylphenol	UG/KG	28000	U	28000	U	25000	U	10000000			
N-Nitrosodi-n-Propylamine	UG/KG	28000	U	28000	U	25000	U	660	100000		
Hexachloroethane	UG/KG	28000	U	28000	U	25000	U	100000	100000		
Nitrobenzene	UG/KG	28000	U	28000	U	25000	U	520000	10000		
Isophorone	UG/KG	28000	U	28000	U	25000	U	10000000	50000		
2-Nitrophenol	UG/KG	28000	U	28000	U	25000	U				
2,4-Dimethylphenol	UG/KG	28000	U	28000	U	25000	U	10000000			
Bis(2-Chloroethoxy) Methane	UG/KG	28000	U	28000	U	25000	U				
2,4-Dichlorophenol	UG/KG	28000	U	28000	U	25000	U	3100000	10000		
1,2,4-Trichlorobenzene	UG/KG	28000	U	28000	U	25000	U	1200000	100000		
4-Chloroaniline	UG/KG	28000	U	28000	U	25000	U	4200000			
Hexachlorobutadiene	UG/KG	28000	U	28000	U	25000	U	21000	100000		
4-Chloro-3-Methylphenol	UG/KG	28000	U	28000	U	25000	U	10000000			
Hexachlorocyclopentadiene	UG/KG	28000	U	28000	U	25000	U	7300000	100000		
2,4,6-Trichlorophenol	UG/KG	28000	U	28000	U	25000	U	270000	10000		
2,4,5-Trichlorophenol	UG/KG	140000	U	140000	U	120000	U	10000000	50000		

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PARAMETERS	UNITS										
2-Chloronaphthalene	UG/KG	28000	U	28000	U	25000	U				
2-Nitroaniline	UG/KG	140000	U	140000	U	120000	U				
Dimethylphthalate	UG/KG	28000	U	28000	U	25000	U	10000000			
2,6-Dinitrotoluene	UG/KG	28000	U	28000	U	25000	U	0			
3-Nitroaniline	UG/KG	140000	U	140000	U	120000	U				
2,4-Dinitrophenol	UG/KG	140000	U	140000	U	120000	U	2100000	10000		
4-Nitrophenol	UG/KG	140000	U	140000	U	120000	U				
Dibenzofuran	UG/KG	28000	U	28000	U	25000	U				
2,4-Dinitrotoluene	UG/KG	28000	U	28000	U	25000	U		10000		
Diethylphthalate	UG/KG	9000	E	790000	E	4200	J	10000000	50000		
4-Chlorophenyl-Phenyl Ether	UG/KG	28000	U	28000	U	25000	U				
4-Nitroaniline	UG/KG	140000	U	140000	U	120000	U				
4,6-Dinitro-2-Methylphenol	UG/KG	140000	U	140000	U	120000	U	0			
N-Nitrosodiphenylamine (1)	UG/KG	28000	U	87000		25000	U	600000	100000		
4-Bromophenyl-Phenylether	UG/KG	28000	U	28000	U	25000	U				
Hexachlorobenzene	UG/KG	28000	U	28000	U	25000	U	2000	100000		
Pentachlorophenol	UG/KG	140000	U	140000	U	120000	U	24000	100000		
Carbazole	UG/KG	28000	U	28000	U	25000	U				
Di-n-Butylphthalate	UG/KG	28000	U	28000	U	25000	U	10000000	100000		
Butylbenzylphthalate	UG/KG	28000	U	28000	U	25000	U	10000000	100000		
3,3'-Dichlorobenzidine	UG/KG	28000	U	28000	U	25000	U	6000	100000		
Bis(2-Ethylhexyl)Phthalate	UG/KG	93000		4400	J	25000	U	210000	100000		
Di-n-Octylphthalate	UG/KG	28000	U	28000	U	25000	U	10000000	100000		
Dibenz(a,h)Anthracene	UG/KG	28000	U	28000	U	25000	U	660	100000		
Benzo(b)Fluoranthene	UG/KG	28000	U	7100	J	2600	J	4000	50000		
Benzo(k)Fluoranthene	UG/KG	28000	U	28000	U	25000	U	4000	500000		

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Platty Kill Canal Phase 2 Sediment Investigation
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PARAMETERS	UNITS										
Indeno(1,2,3-cd)Pyrene	UG/KG	28000	U	28000	U	25000	U	4000	500000		
Benzo(g,h,i)Perylene	UG/KG	28000	U	6300	J	25000	U	0			
Acenaphthylene	UG/KG	28000	U	28000	U	25000	U				
Naphthalene	UG/KG	5400	J	190000		54000		4200000	100000	160	2100
2-Methylnaphthalene	UG/KG	22000	J	500000	E	240000				70	670
Acenaphthene	UG/KG	6000	J	20000	J	9300	J	10000000	100000	16	500
Fluorene	UG/KG	9000	J	65000		27000		10000000	100000	19	540
Phenanthrene	UG/KG	26000	J	120000		52000		0	100000	240	1500
Anthracene	UG/KG	6900	J	28000	J	13000	J	10000000	100000	85.3	1100
Fluoranthene	UG/KG	7600	J	12000	J	7500	J	10000000	100000	600	5100
Pyrene	UG/KG	9800	J	30000		14000	J	10000000	100000	665	2600
Benzo(a)Anthracene	UG/KG	4300	J	12000	J	7200	J	4000	500000	261	1600
Chrysene	UG/KG	5600	J	22000	J	8300	J	40000	50000	384	2800
Benzo(a)Pyrene	UG/KG	28000	U	7600	J	3800	J	660	100000	430	1600
SEMI-VOLATILE TICS											
Dimethyl Naphthalene Isomer	UG/KG	59000	J	200000	J	81000	J				
Naphthalene, Trimethyl- Isomer	UG/KG	73000	J	150000	J	110000	J				
Unknown	UG/KG										
Unknown Alkane	UG/KG	92000	J	240000	J	400000	J				
Unknown Aromatic	UG/KG					230000	J				
Unknown Cycloalkane	UG/KG	18000	J	460000	J	190000	J				
Unknown Pah	UG/KG	45000	J	120000	J						
Anthracene, Methyl- Isomer	UG/KG										
Decahydro-4,4,8,9,10-Pentamethylnap	UG/KG	38000	JN	190000	JN	81000	J N				
Unknown Hydrocarbon	UG/KG					110000	J				

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PARAMETERS	**UNITS**										
Methyl Methylethyl Benzene Isomer	UG/KG	20000	J								
Naphthalene, Trimethyl Isomer	UG/KG										
Trimethyl Benzene Isomer	UG/KG			110000	J						
Tetramethyl Benzene Isomer	UG/KG										
9h-Fluorene, Methyl- Isomer	UG/KG										
Naphthalene, Ethyl- Isomer	UG/KG	31000	J	150000	J						
PESTICIDES/PCB's								0			
alpha BHC	UG/KG	48	U	220		77		0			
beta BHC	UG/KG	48	U	190	U	42	U	0			
delta BHC	UG/KG	41	J	520		42	U				
gamma BHC	UG/KG	48	U	190	U	42	U	0			
Heptachlor	UG/KG	48	U	240		42	U	650	50000		
Aldrin	UG/KG	48	U	190	U	58		170	50000		
Heptachlor epoxide	UG/KG	48	U	190	U	42	U				
Endosulfan I	UG/KG	48	U	190	U	42	U	0	50000		
Dieldrin	UG/KG	95	U	420		83	U	180	50000		
4,4'-DDE	UG/KG	95	U	1600		83	U	9000	50000		
Endrin	UG/KG	110		380	U	83	U	310000	50000		
Endosulfan II	UG/KG	95	U	380	U	83	U	6200000			
4,4'-DDD	UG/KG	380		1500		61	J	12000	50000		
Endosulfan sulfate	UG/KG	95	U	380	U	36	J				
4,4'-DDT	UG/KG	95	U	380	U	83	U	9000	50000		
Methoxychlor	UG/KG	480	U	1900	U	420	U	5200000	50000		
Endrin ketone	UG/KG	95	U	380	U	83	U				
Endrin Aldehyde	UG/KG	95	U	240	J	83	U				
alpha-Chlordane	UG/KG	27	J	130	J	42	U				

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PARAMETERS	**UNITS**							
gamma-Chlordane	UG/KG	100	110 J	42 U				
Toxaphene	UG/KG	1900 U	7600 U	1700 U	200	50000		
Aroclor-1016	UG/KG	950 U	3800 U	830 U				
Aroclor-1221	UG/KG	950 U	3800 U	830 U				
Aroclor-1232	UG/KG	950 U	3800 U	830 U				
Aroclor-1242	UG/KG	950 U	3800 U	830 U				
Aroclor-1248	UG/KG	950 U	3800 U	830 U				
Aroclor-1254	UG/KG	950 U	3800 U	830 U				
Aroclor-1260	UG/KG	950 U	3800 U	830 U				
METALS								
Aluminum	MG/KG	18500	19000	21300	0			
Antimony	MG/KG	1 B	3.6 B	5 B	340			
Arsenic	MG/KG	29.5	128	194	20		8.2	70
Barium	MG/KG	195	341	175	47000			
Beryllium	MG/KG	1.2 B	1.5	1.5	1			
Cadmium	MG/KG	10	12.7	7.6	100		1.2	9.6
Calcium	MG/KG	4950	5760	4040	0			
Chromium	MG/KG	342	428	317	0		81	370
Cobalt	MG/KG	14.8	15.1	13.8	0			
Copper	MG/KG	1560	621	506	600		34	270
Iron	MG/KG	39000	48800	38600	0			
Lead	MG/KG	554	2020	2860	600		46.7	218
Magnesium	MG/KG	9080	9330	7550	0			
Manganese	MG/KG	368	483	359	0			
Mercury	MG/KG	8.3	8.7	9.1	270		0.15	0.71
Nickel	MG/KG	76	65.6	56.2	2400		20.9	51.6

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PARAMETERS	UNITS							
Potassium	MG/KG	5170	4670	3670	0			
Selenium	MG/KG	2.9	6.2	9.2	3100			
Silver	MG/KG	9.6	10.6	5.5	4100		1	3.7
Sodium	MG/KG	13000	10900	8020	0			
Thallium	MG/KG	3.3	4.2	4.2	2			
Vanadium	MG/KG	74.6	66.3	69.4	7100			
Zinc	MG/KG	713	856	773	1500		150	410

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PARAMETERS	**UNITS**								
VOLATILES									
Chloromethane	UG/KG	150 U	6300 U	16000 U	16000 U	1000000	10000		
Bromomethane	UG/KG	150 U	6300 U	16000 U	16000 U	1000000	1000		
Vinyl Chloride	UG/KG	150 U	6300 U	16000 U	16000 U	7000	10000		
Chloroethane	UG/KG	150 U	6300 U	16000 U	16000 U				
Methylene Chloride	UG/KG	76 U	3300 U	8400 U	8200 U	210000	1000		
Acetone	UG/KG	150 U	6300 U	16000 U	16000 U	1000000	100000		
Carbon Disulfide	UG/KG	76 U	3300 U	8400 U	8200 U				
1,1-Dichloroethene	UG/KG	76 U	3300 U	8400 U	8200 U	150000	10000		
1,1-Dichloroethane	UG/KG	76 U	3300 U	8400 U	8200 U	1000000	1000		
1,2-Dichloroethene(total)	UG/KG	76 U	3300 U	8400 U	8200 U		50000		
Chloroform	UG/KG	76 U	3300 U	8400 U	8200 U	28000	1000		
1,2-Dichloroethane	UG/KG	76 U	3300 U	8400 U	8200 U	24000	1000		
2-Butanone	UG/KG	150 U	6300 U	16000 U	16000 U	1000000	50000		
1,1,1-Trichloroethane	UG/KG	76 U	3300 U	8400 U	8200 U	1000000	50000		
Carbon Tetrachloride	UG/KG	76 U	3300 U	8400 U	8200 U	4000	1000		
Bromodichloromethane	UG/KG	76 U	3300 U	8400 U	8200 U	46000	1000		
1,2-Dichloropropane	UG/KG	76 U	3300 U	8400 U	8200 U	43000			
cis-1,3-Dichloropropene	UG/KG	76 U	3300 U	8400 U	8200 U	5000	1000		
Trichloroethene	UG/KG	76 U	3300 U	8400 U	8200 U	54000	1000		
Dibromochloromethane	UG/KG	76 U	3300 U	8400 U	8200 U	1000000	1000		
1,1,2-Trichloroethane	UG/KG	76 U	3300 U	8400 U	8200 U	420000	1000		
Benzene	UG/KG	220	3300 U	8400 U	8200 U	13000	1000		
Trans-1,3-Dichloropropene	UG/KG	76 U	3300 U	8400 U	8200 U	5000			
Bromoform	UG/KG	76 U	3300 U	8400 U	8200 U	370000	1000		

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PARAMETERS	**UNITS**												
4-Methyl-2-Pentanone	UG/KG	150	U	6300	U	16000	U	16000	U	1000000	50000		
2-Hexanone	UG/KG	150	U	6300	U	16000	U	16000	U				
Tetrachloroethene	UG/KG	76	U	3300	U	8400	U	8200	U	6000			
Toluene	UG/KG	76	U	3300	U	18000		8200	U	1000000	500000		
1,1,2,2-Tetrachloroethane	UG/KG	76	U	3300	U	8400	U	8200	U	70000	1000		
Chlorobenzene	UG/KG	76	U	3300	U	8400	U	8200	U	680000	1000		
Ethylbenzene	UG/KG	76	U	15000		32000		15000		1000000	100000		
Styrene	UG/KG	76	U	3300	U	8400	U	8200	U	97000	100000		
Total Xylenes	UG/KG	76	U	12000		220000		8200	U	1000000	10000		
VOLATILE TICS													
Cyclohexane, 1,2-Dimethyl-, Trans-	UG/KG			150000	JN								
Cyclohexane, Methyl-	UG/KG			420000	JN	350000	JN	450000	JN				
Unknown Cycloalkane	UG/KG	330	J	140000	J	380000	J	420000	J				
1h-Indene,Dihydro-Methyl Isomer	UG/KG			150000	J	320000	J	180000	J				
Ethyl Dimethyl Benzene Isomer	UG/KG			140000	J	320000	J						
Ethylmethyl Benzene Isomer	UG/KG					200000	J	210000	J				
Unknown Alkane	UG/KG	450	J	34000	J	75000	J	48000	J				
Methyl Propyl Benzene Isomer	UG/KG	310	J										
Trimethyl Benzene Isomer	UG/KG	380	J			110000	J						
1h-Indene,Dihydro-Dimethyl Isomer	UG/KG					210000	J						
Methyl Naphthalene Isomer	UG/KG					200000	J						
Naphthalene	UG/KG	30000	U	10000	J	200000	JN	11000	J	4200000		160	2100
Cyclohexane, 1-Ethyl-2-Methyl-, Cis-(8c	UG/KG							180000	JN				
Pentalene, Octahydro-2-Methyl-	UG/KG							200000	JN				
Diethyl Benzene Isomer	UG/KG							220000	J				

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PARAMETERS	**UNITS**												
Methyl Methylethyl Benzene Isomer	UG/KG			37000	J								
Unknown Aromatic	UG/KG												
SEMI-VOLATILES										0			
Phenol	UG/KG	30000	U	26000	U	2700	U	26000	U	10000000	50000		
Bis(2-Chloroethyl)Ether	UG/KG	30000	U	26000	U	27000	U	26000	U	3000	10000		
2-Chlorophenol	UG/KG	30000	U	26000	U	27000	U	26000	U	5200000	10000		
1,3-Dichlorobenzene	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000	100000		
1,4-Dichlorobenzene	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000	100000		
1,2-Dichlorobenzene	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000	50000		
2-Methylphenol	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000			
2,2'-Oxybis(1-Chloropropane)	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000			
4-Methylphenol	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000			
N-Nitrosodi-n-Propylamine	UG/KG	30000	U	26000	U	27000	U	26000	U	660	100000		
Hexachloroethane	UG/KG	30000	U	26000	U	27000	U	26000	U	100000	100000		
Nitrobenzene	UG/KG	30000	U	26000	U	27000	U	26000	U	520000	10000		
Isophorone	UG/KG	30000	U	26000	U	49000		26000	U	10000000	50000		
2-Nitrophenol	UG/KG	30000	U	26000	U	27000	U	26000	U				
2,4-Dimethylphenol	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000			
Bis(2-Chloroethoxy) Methane	UG/KG	30000	U	26000	U	27000	U	26000	U				
2,4-Dichlorophenol	UG/KG	30000	U	26000	U	27000	U	26000	U	3100000	10000		
1,2,4-Trichlorobenzene	UG/KG	30000	U	26000	U	27000	U	26000	U	1200000	100000		
4-Chloroaniline	UG/KG	30000	U	26000	U	27000	U	26000	U	4200000			
Hexachlorobutadiene	UG/KG	30000	U	26000	U	27000	U	26000	U	21000	100000		
4-Chloro-3-Methylphenol	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000			
Hexachlorocyclopentadiene	UG/KG	30000	U	26000	U	27000	U	26000	U	7300000	100000		
2,4,6-Trichlorophenol	UG/KG	30000	U	26000	U	27000	U	26000	U	270000	10000		

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED19A 62372004 06/06/96 SLUDGE		PKCSED19B 62372005 06/06/96 SLUDGE		PKCSED19C 62372006 06/06/96 SLUDGE		PKCSED19D 62372007 06/06/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	UNITS												
2,4,5-Trichlorophenol	UG/KG	150000	U	130000	U	140000	U	130000	U	10000000	50000		
2-Chloronaphthalene	UG/KG	30000	U	26000	U	27000	U	26000	U				
2-Nitroaniline	UG/KG	150000	U	130000	U	140000	U	130000	U				
Dimethylphthalate	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000			
2,6-Dinitrotoluene	UG/KG	30000	U	26000	U	27000	U	26000	U	0			
3-Nitroaniline	UG/KG	150000	U	130000	U	140000	U	130000	U				
2,4-Dinitrophenol	UG/KG	150000	U	130000	U	140000	U	130000	U	2100000	10000		
4-Nitrophenol	UG/KG	150000	U	130000	U	140000	U	130000	U				
Dibenzofuran	UG/KG	30000	U	26000	U	27000	U	26000	U				
2,4-Dinitrotoluene	UG/KG	30000	U	26000	U	27000	U	26000	U		10000		
Diethylphthalate	UG/KG	30000	U	26000	U	9900	J	26000	U	10000000	50000		
4-Chlorophenyl-Phenyl Ether	UG/KG	30000	U	26000	U	27000	U	26000	U				
4-Nitroaniline	UG/KG	150000	U	130000	U	140000	U	130000	U				
4,6-Dinitro-2-Methylphenol	UG/KG	150000	U	130000	U	140000	.U	130000	U	0			
N-Nitrosodiphenylamine (1)	UG/KG	30000	U	26000	U	27000	U	9200	J	600000	100000		
4-Bromophenyl-Phenylether	UG/KG	30000	U	26000	U	27000	U	26000	U				
Hexachlorobenzene	UG/KG	30000	U	26000	U	27000	U	26000	U	2000	100000		
Pentachlorophenol	UG/KG	150000	U	130000	U	140000	U	130000	U	24000	100000		
Carbazole	UG/KG	30000	U	26000	U	27000	U	26000	U				
Di-n-Butylphthalate	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000	100000		
Butylbenzylphthalate	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000	100000		
3,3'-Dichlorobenzidine	UG/KG	30000	U	26000	U	27000	U	26000	U	6000	100000		
Bis(2-Ethylhexyl)Phthalate	UG/KG	22000	J	3500	J	4000	J	5500	J	210000	100000		
Di-n-Octylphthalate	UG/KG	30000	U	26000	U	27000	U	26000	U	10000000	100000		
Dibenz(a,h)Anthracene	UG/KG	30000	U	26000	U	27000	U	26000	U	660	100000		
Benzo(b)Fluoranthene	UG/KG	30000	U	26000	U	49000	J	26000	U	4000	50000		

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PARAMETERS	**UNITS**												
Benzo(k)Fluoranthene	UG/KG	30000	U	26000	U	27000	U	26000	U	4000	500000		
Indeno(1,2,3-cd)Pyrene	UG/KG	30000	U	26000	U	27000	U	26000	U	4000	500000		
Benzo(g,h,i)Perylene	UG/KG	30000	U	26000	U	3300	J	26000	U	0			
Acenaphthylene	UG/KG	30000	U	26000	U	260000		26000	U				
Naphthalene	UG/KG	30000	U	10000	J	260000	JN	11000	J	4200000	100000	160	2100
2-Methylnaphthalene	UG/KG	8900	J	31000		660000	E	34000				70	670
Acenaphthene	UG/KG	30000	U	26000	U	26000	J	26000	U	10000000	100000	16	500
Fluorene	UG/KG	30000	U	6000	J	75000		9200	J	10000000	100000	19	540
Phenanthrene	UG/KG	13000	J	11000	J	130000		20000	J	0	100000	240	1500
Anthracene	UG/KG	30000	U	3000	J	21000	J	3600	J	10000000	100000	85.3	1100
Fluoranthene	UG/KG	3600	J	26000	U	19000	J	4800	J	10000000	100000	600	5100
Pyrene	UG/KG	4200	J	2900	J	34000		6200	J	10000000	100000	665	2600
Benzo(a)Anthracene	UG/KG	30000	U	26000	U	16000	J	2900	J	4000	500000	261	1600
Chrysene	UG/KG	3400	J	26000	U	19000	J	3700	J	40000	500000	384	2800
Benzo(a)Pyrene	UG/KG	30000	U	26000	U	7000	J	26000	U	660	100000	430	1600

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PARAMETERS	**UNITS**												
SEMI-VOLATILE TICS						27000	U	26000	U				
Dimethyl Naphthalene Isomer	UG/KG	29000	J	38000	J								
Naphthalene, Trimethyl- Isomer	UG/KG	37000	J	38000	J								
Unknown	UG/KG	36000	J	43000	J	120000	J	58000	J				
Unknown Alkane	UG/KG	450	J	34000	J	86000	J	54000	J				
Unknown Aromatic	UG/KG					85000	J	53000	J				
Unknown Cycloalkane	UG/KG	330	J	140000	J	75000	J	48000	J				
Unknown Pah	UG/KG	21000	J	28000	J								
Anthracene, Methyl- Isomer	UG/KG	22000	J			380000	J	420000	J				
Decahydro-4,4,8,9,10-Pentamethylnap	UG/KG	24000	JN	45000	JN								
Unknown Hydrocarbon	UG/KG	21000	JN										
Methyl Methylethyl Benzene Isomer	UG/KG			37000	J			67000	JN				
Naphthalene, Trimethyl Isomer	UG/KG			46000	J	80000	J	46000	J				
Trimethyl Benzene Isomer	UG/KG	380	J										
Tetramethyl Benzene Isomer	UG/KG												
9h-Fluorene, Methyl- Isomer	UG/KG					110000	J						
Naphthalene, Ethyl- Isomer	UG/KG							50000	J				
PESTICIDES/PCB's										0			
alpha BHC	UG/KG	100	U	61		89	J	44	U	0			
beta BHC	UG/KG	100	U	44	U	90	U	44	U	0			
delta BHC	UG/KG	870		44	U	90	U	44	U				
gamma BHC	UG/KG	100	U	44	U	86	J	44	U	0			
Heptachlor	UG/KG	100	U	90		49	J	44	U	650	50000		
Aldrin	UG/KG	100	U	44	U	17	J	44	U	170	50000		
Heptachlor epoxide	UG/KG	100	U	14	J	90	U	44	U				

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PARAMETERS	UNITS								
Endosulfan I	UG/KG	100 U	44 U	90 U	44 U	0	50000		
Dieldrin	UG/KG	200 U	88 U	180 U	88 U	180	50000		
4,4'-DDE	UG/KG	200 U	770	560	720	9000	50000		
Endrin	UG/KG	200 U	88 U	180 U	88 U	310000	50000		
Endosulfan II	UG/KG	200 U	88 U	180 U	88 U	6200000			
4,4'-DDD	UG/KG	360	360	590	670	12000	50000		
Endosulfan sulfate	UG/KG	200 U	88 U	180 U	18 J				
4,4'-DDT	UG/KG	200 U	88 U	110 J	88 U	9000	50000		
Methoxychlor	UG/KG	1000 U	440 U	900 U	440 U	5200000	50000		
Endrin ketone	UG/KG	200 U	31 J	180 U	59 J				
Endrin Aldehyde	UG/KG	200 U	88 U	180 U	88 U				
alpha-Chlordane	UG/KG	140	49	90 U	71				
gamma-Chlordane	UG/KG	100 U	48	90 U	77				
Toxaphene	UG/KG	4000 U	1800 U	3600 U	1800 U	200	50000		
Aroclor-1016	UG/KG	2000 U	880 U	1800 U	880 U				
Aroclor-1221	UG/KG	2000 U	880 U	1800 U	880 U				
Aroclor-1232	UG/KG	2000 U	880 U	1800 U	880 U				
Aroclor-1242	UG/KG	2000 U	880 U	1800 U	880 U				
Aroclor-1248	UG/KG	2000 U	880 U	1800 U	880 U				
Aroclor-1254	UG/KG	2000 U	880 U	1800 U	880 U				
Aroclor-1260	UG/KG	2000 U	880 U	1800 U	880 U				
METALS									
Aluminum	MG/KG	16100	16000	16500	16000	0			
Antimony	MG/KG	2.3 B	1.9 B	2.6 B	2 B	340			
Arsenic	MG/KG	44.9	54.4	80.6	76	20		8.2	70
Barium	MG/KG	276	224	240	225	47000			

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
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PARAMETERS	UNITS								
Beryllium	MG/KG	1.1 B	1.2 B	1.2 B	1.2 B	1			
Cadmium	MG/KG	12.8	10.1	9.9	9.8	100		1.2	9.6
Calcium	MG/KG	5600	5740	4620	5490	0			
Chromium	MG/KG	431	428	435	395	0		81	370
Cobalt	MG/KG	15.5	13.4	13.4 B	13.1 B	0			
Copper	MG/KG	935	541	605	543	600		34	270
Iron	MG/KG	39500	42400	40200	41400	0			
Lead	MG/KG	798	844	1120	1050	600		46.7	218
Magnesium	MG/KG	8830	8330	7950	8210	0			
Manganese	MG/KG	357	421	388	403	0			
Mercury	MG/KG	9.2	6.7	8.7	7.6	270		0.15	0.71
Nickel	MG/KG	104	71.8	64.2	67.6	2400		20.9	51.6
Potassium	MG/KG	4400	4200	3970	4180	0			
Selenium	MG/KG	3.3	4.5	5	5.5	3100			
Silver	MG/KG	10.6	10.2	9.9	9.2	4100		1	3.7
Sodium	MG/KG	13500	10200	8700	10400	0			
Thallium	MG/KG	3.6	3	3.5	3.7	2			
Vanadium	MG/KG	86.7	70.8	57.4	62.1	7100			
Zinc	MG/KG	832	675	798	753	1500		150	410

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Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED21A 62372001 06/06/96 SLUDGE		PKCSED21B 62372002 06/06/96 SLUDGE		PKCSED21C 62372003 06/06/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	**UNITS**										
VOLATILES											
Chloromethane	UG/KG	3300	U	6500	U	6300	U	1000000	10000		
Bromomethane	UG/KG	3300	U	6500	U	6300	U	1000000	1000		
Vinyl Chloride	UG/KG	3300	U	6500	U	6300	U	7000	10000		
Chloroethane	UG/KG	3300	U	6500	U	6300	U				
Methylene Chloride	UG/KG	1700	U	3400	U	3300	U	210000	1000		
Acetone	UG/KG	3300	U	6500	U	6300	U	1000000	100000		
Carbon Disulfide	UG/KG	1700	U	3400	U	3300	U				
1,1-Dichloroethene	UG/KG	1700	U	3400	U	3300	U	150000	10000		
1,1-Dichloroethane	UG/KG	1700	U	3400	U	3300	U	1000000	1000		
1,2-Dichloroethene(total)	UG/KG	1700	U	3400	U	3300	U		50000		
Chloroform	UG/KG	1700	U	3400	U	3300	U	28000	1000		
1,2-Dichloroethane	UG/KG	1700	U	3400	U	3300	U	24000	1000		
2-Butanone	UG/KG	3300	U	6500	U	6300	U	1000000	50000		
1,1,1-Trichloroethane	UG/KG	1700	U	3400	U	3300	U	1000000	50000		
Carbon Tetrachloride	UG/KG	1700	U	3400	U	3300	U	4000	1000		
Bromodichloromethane	UG/KG	1700	U	3400	U	3300	U	46000	1000		
1,2-Dichloropropane	UG/KG	1700	U	3400	U	3300	U	43000			
cis-1,3-Dichloropropene	UG/KG	1700	U	3400	U	3300	U	5000	1000		
Trichloroethene	UG/KG	1700	U	3400	U	3300	U	54000	1000		
Dibromochloromethane	UG/KG	1700	U	3400	U	3300	U	1000000	1000		
1,1,2-Trichloroethane	UG/KG	1700	U	3400	U	3300	U	420000	1000		
Benzene	UG/KG	1700	U	3400	U	3300	U	13000	1000		
Trans-1,3-Dichloropropene	UG/KG	1700	U	3400	U	3300	U	5000			
Bromoform	UG/KG	1700	U	3400	U	3300	U	370000	1000		

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CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED21A 62372001 06/06/96 SLUDGE		PKCSED21B 62372002 06/06/96 SLUDGE		PKCSED21C 62372003 06/06/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	**UNITS**										
4-Methyl-2-Pentanone	UG/KG	3300	U	6500	U	6300	U	1000000	50000		
2-Hexanone	UG/KG	3300	U	6500	U	6300	U				
Tetrachloroethene	UG/KG	1700	U	3400	U	3300	U	6000			
Toluene	UG/KG	1700	U	3400	U	22000		1000000	500000		
1,1,2,2-Tetrachloroethane	UG/KG	1700	U	3400	U	3300	U	70000	1000		
Chlorobenzene	UG/KG	1700	U	3400	U	3300	U	680000	1000		
Ethylbenzene	UG/KG	5700		36000		22000		1000000	100000		
Styrene	UG/KG	1700	U	3400	U	3300	U	97000	100000		
Total Xylenes	UG/KG	4600		150000		150000		1000000	10000		
VOLATILE TICS											
Cyclohexane, 1,2-Dimethyl-, Trans-	UG/KG	80000	JN			120000	JN				
Cyclohexane, Methyl-	UG/KG	140000	JN	270000	JN						
Unknown Cycloalkane	UG/KG	64000	J	120000	J	260000	J				
1h-Indene,Dihydro-Methyl Isomer	UG/KG	64000	J	120000	J	150000	J				
Ethyl Dimethyl Benzene Isomer	UG/KG	64000	J	120000	J	150000	J				
Ethylmethyl Benzene Isomer	UG/KG	64000	J	140000	J	110000	J				
Unknown Alkane	UG/KG	64000	J	120000	J	190000	J				
Methyl Propyl Benzene Isomer	UG/KG	64000	J								
Trimethyl Benzene Isomer	UG/KG	64000	J								
1h-Indene,Dihydro-Dimethyl Isomer	UG/KG	64000	J								
Methyl Naphthalene Isomer	UG/KG	64000	J								
Naphthalene	UG/KG	200000	JN	90000		61000		4200000		160	2100
Cyclohexane, 1-Ethyl-2-Methyl-, Cis- (8c	UG/KG	180000	JN								
Pentalene, Octahydro-2-Methyl-	UG/KG	200000	JN								
Diethyl Benzene Isomer	UG/KG	64000	J								
Methyl Methylethyl Benzene Isomer	UG/KG	64000	J								

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PARAMETERS	UNITS										
Unknown Aromatic	UG/KG	64000	J								
SEMI-VOLATILES								0			
Phenol	UG/KG	28000	U	27000	U	26000	U	10000000	50000		
Bis(2-Chloroethyl)Ether	UG/KG	28000	U	27000	U	26000	U	3000	10000		
2-Chlorophenol	UG/KG	28000	U	27000	U	26000	U	5200000	10000		
1,3-Dichlorobenzene	UG/KG	5500	J	27000	U	26000	U	10000000	100000		
1,4-Dichlorobenzene	UG/KG	28000	U	27000	U	26000	U	10000000	100000		
1,2-Dichlorobenzene	UG/KG	28000	U	27000	U	26000	U	10000000	50000		
2-Methylphenol	UG/KG	28000	U	27000	U	26000	U	10000000			
2,2'-Oxybis(1-Chloropropane)	UG/KG	28000	U	27000	U	26000	U	10000000			
4-Methylphenol	UG/KG	28000	U	27000	U	26000	U	10000000			
N-Nitrosodi-n-Propylamine	UG/KG	28000	U	27000	U	26000	U	660	100000		
Hexachloroethane	UG/KG	28000	U	27000	U	26000	U	100000	100000		
Nitrobenzene	UG/KG	28000	U	27000	U	26000	U	520000	10000		
Isophorone	UG/KG	28000	U	27000	U	26000	U	10000000	50000		
2-Nitrophenol	UG/KG	28000	U	27000	U	26000	U				
2,4-Dimethylphenol	UG/KG	28000	U	27000	U	26000	U	10000000			
Bis(2-Chloroethoxy) Methane	UG/KG	28000	U	27000	U	26000	U				
2,4-Dichlorophenol	UG/KG	28000	U	27000	U	26000	U	3100000	10000		
1,2,4-Trichlorobenzene	UG/KG	28000	U	27000	U	26000	U	1200000	100000		
4-Chloroaniline	UG/KG	28000	U	27000	U	26000	U	4200000			
Hexachlorobutadiene	UG/KG	28000	U	27000	U	26000	U	21000	100000		
4-Chloro-3-Methylphenol	UG/KG	28000	U	27000	U	26000	U	10000000			
Hexachlorocyclopentadiene	UG/KG	28000	U	27000	U	26000	U	7300000	100000		
2,4,6-Trichlorophenol	UG/KG	28000	U	27000	U	26000	U	270000	10000		

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED21A 62372001 06/06/96 SLUDGE		PKCSED21B 62372002 06/06/96 SLUDGE		PKCSED21C 62372003 06/06/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	UNITS										
2,4,5-Trichlorophenol	UG/KG	140000	U	140000	U	130000	U	10000000	50000		
2-Chloronaphthalene	UG/KG	28000	U	27000	U	26000	U				
2-Nitroaniline	UG/KG	140000	U	140000	U	130000	U				
Dimethylphthalate	UG/KG	28000	U	27000	U	26000	U	10000000			
2,6-Dinitrotoluene	UG/KG	28000	U	27000	U	26000	U	0			
3-Nitroaniline	UG/KG	140000	U	140000	U	130000	U				
2,4-Dinitrophenol	UG/KG	140000	U	140000	U	130000	U	2100000	10000		
4-Nitrophenol	UG/KG	140000	U	140000	U	130000	U				
Dibenzofuran	UG/KG	28000	U	28000		23000	J				
2,4-Dinitrotoluene	UG/KG	28000	U	27000	U	26000	U		10000		
Diethylphthalate	UG/KG	28000	U	27000	U	26000	U	10000000	50000		
4-Chlorophenyl-Phenyl Ether	UG/KG	28000	U	27000	U	26000	U				
4-Nitroaniline	UG/KG	140000	U	140000	U	130000	U				
4,6-Dinitro-2-Methylphenol	UG/KG	140000	U	140000	U	130000	U	0			
N-Nitrosodiphenylamine (1)	UG/KG	28000	U	27000	U	26000	U	600000	100000		
4-Bromophenyl-Phenylether	UG/KG	28000	U	27000	U	26000	U				
Hexachlorobenzene	UG/KG	28000	U	27000	U	26000	U	2000	100000		
Pentachlorophenol	UG/KG	140000	U	140000	U	130000	U	24000	100000		
Carbazole	UG/KG	15000	J	14000	J	26000	U				
Di-n-Butylphthalate	UG/KG	28000	U	27000	U	26000	U	10000000	100000		
Butylbenzylphthalate	UG/KG	28000	U	27000	U	26000	U	10000000	100000		
3,3'-Dichlorobenzidine	UG/KG	28000	U	27000	U	26000	U	6000	100000		
Bis(2-Ethylhexyl)Phthalate	UG/KG	21000	J	27000	U	26000	U	210000	100000		
Di-n-Octylphthalate	UG/KG	28000	U	27000	U	26000	U	10000000	100000		
Benzo(b)Fluoranthene	UG/KG	9400	J	11000	J	4600	J	4000	100000		
Benzo(k)Fluoranthene	UG/KG	4800	J	27000	U	26000	U	4000	50000		

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PARAMETERS	UNITS										
Indeno(1,2,3-cd)Pyrene	UG/KG	28000	U	27000	U	26000	U	4000	500000		
Benzo(g,h,i)Perylene	UG/KG	4600	J	3800	J	2900	J	0	500000		
Acenaphthylene	UG/KG	28000	U	27000	U	26000	U				
Naphthalene	UG/KG	69000		90000		61000		4200000		160	2100
2-Methylnaphthalene	UG/KG	320000		340000		260000			100000	70	670
Acenaphthene	UG/KG	42000		27000	U	12000	J	10000000		16	500
Fluorene	UG/KG	88000		54000		31000		10000000	100000	19	540
Phenanthrene	UG/KG	250000		110000		48000		0	100000	240	1500
Anthracene	UG/KG	49000		23000	J	10000	J	10000000	100000	85.3	1100
Fluoranthene	UG/KG	44000		43000		9400	J	10000000	100000	600	5100
Pyrene	UG/KG	78000		38000		14000	J	10000000	100000	665	2600
Benzo(a)Anthracene	UG/KG	24000	J	16000	J	6400	J	4000	100000	261	1600
Chrysene	UG/KG	41000		18000	J	9700	J	40000	500000	384	2800
Benzo(a)Pyrene	UG/KG	10000	J	9800	J	4200	J	660	500000	430	1600
Dibenz(a,h)Anthracene	UG/KG	28000	U	27000	U	26000	U	660	100000		
SEMI-VOLATILE TICS											
Dimethyl Naphthalene Isomer	UG/KG	5.3	J	140000	J						
Naphthalene, Trimethyl- Isomer	UG/KG	5.3	J	120000	J						
Unknown	UG/KG	5.3	J	140000	J						
Unknown Alkane	UG/KG	5.3	J	120000	J	190000	J				
Unknown Aromatic	UG/KG	5.3	J								
Unknown Cycloalkane	UG/KG	5.3	J	120000	J	260000	J				
Unknown Pah	UG/KG	5.3	J								
Anthracene, Methyl- Isomer	UG/KG	5.3	J								
Decahydro-4,4,8,9,10-Pentamethylnap	UG/KG	65	JN								

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PARAMETERS	**UNITS**										
Unknown Hydrocarbon	UG/KG	5.3	J								
Methyl Methylethyl Benzene Isomer	UG/KG	5.3	J								
Naphthalene, Trimethyl Isomer	UG/KG	5.3	J								
Trimethyl Benzene Isomer	UG/KG	5.3	J								
Tetramethyl Benzene Isomer	UG/KG	5.3	J								
9h-Fluorene, Methyl- Isomer	UG/KG	5.3	J								
Naphthalene, Ethyl- Isomer	UG/KG	5.3	J								
PESTICIDES/PCB's								0			
alpha BHC	UG/KG	92	U	90	U	54		0			
beta BHC	UG/KG	92	U	90	U	44	U	0			
delta BHC	UG/KG	200		90	U	44	U				
gamma BHC	UG/KG	92	U	55	J	44	U	0			
Heptachlor	UG/KG	92	U	90	U	44	U	650	50000		
Aldrin	UG/KG	92	U	90	U	23	J	170	50000		
Heptachlor epoxide	UG/KG	92	U	90	U	44	U				
Endosulfan I	UG/KG	92	U	90	U	44	U	0	50000		
Dieldrin	UG/KG	180	U	300		170		180	50000		
4,4'-DDE	UG/KG	180	U	550		28	J	900	50000		
Endrin	UG/KG	130	J	180	U	88	U	310000	50000		
Endosulfan II	UG/KG	180	U	180	U	88	U	6200000			
4,4'-DDD	UG/KG	1500		710		51	J	12000	50000		
Endosulfan sulfate	UG/KG	220		21	J	20	J				
4,4'-DDT	UG/KG	180	U	180	U	34	J	9000	50000		
Methoxychlor	UG/KG	920	U	900	U	440	U	5200000	50000		
Endrin ketone	UG/KG	180	U	34	J	88	U				
Endrin Aldehyde	UG/KG	180	U	180	U	88	U				

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PARAMETERS	UNITS							
alpha-Chlordane	UG/KG	170	90 U	44 U				
gamma-Chlordane	UG/KG	310	73 J	36 J				
Toxaphene	UG/KG	3700 U	3600 U	1800 U	200	50000		
Aroclor-1016	UG/KG	1800 U	1800 U	880 U				
Aroclor-1221	UG/KG	1800 U	1800 U	880 U				
Aroclor-1232	UG/KG	1800 U	1800 U	880 U				
Aroclor-1242	UG/KG	1800 U	1800 U	880 U				
Aroclor-1248	UG/KG	1800 U	1800 U	880 U				
Aroclor-1254	UG/KG	1800 U	1800 U	880 U				
Aroclor-1260	UG/KG	1800 U	1800 U	880 U				
METALS					0			
Aluminum	MG/KG	17300	18200	24600	0			
Antimony	MG/KG	3.2 B	1.7 B	2 B	340			
Arsenic	MG/KG	126	82.4	167	20		8.2	70
Barium	MG/KG	543	208	217	47000			
Beryllium	MG/KG	1.1 B	1.3	1.9	1			
Cadmium	MG/KG	13.1	9.6	5.8	100		1.2	9.6
Calcium	MG/KG	6730	5040	3580				
Chromium	MG/KG	528	457	295	0		81	370
Cobalt	MG/KG	19.7	13.2 B	13.5				
Copper	MG/KG	1120	546	407	600		34	270
Iron	MG/KG	51800	65200	37000	0			
Lead	MG/KG	1860	1080	1740	600		46.7	218
Magnesium	MG/KG	7860	8000	7470				
Manganese	MG/KG	373	473	323	0			
Mercury	MG/KG	6.4	7.6	7.3	270		0.15	0.71

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PARAMETERS	UNITS							
Nickel	MG/KG	102	61.8	50	2400		20.9	51.6
Potassium	MG/KG	4150	4420	3840				
Selenium	MG/KG	4.1	7	7.1	3100			
Silver	MG/KG	10.5	9.7	5	4100		1	3.7
Sodium	MG/KG	11300	9830	7860	0			
Thallium	MG/KG	4.1	4.1	4.3	2			
Vanadium	MG/KG	138	82.1	70.8	7100			
Zinc	MG/KG	918	718	632	1500		150	410

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PARAMETERS	**UNITS**												
VOLATILES													
Chloromethane	UG/KG	6700	U	67000	U	33000	U	33000	U	1000000	10000		
Bromomethane	UG/KG	6700	U	67000	U	33000	U	33000	U	1000000	1000		
Vinyl Chloride	UG/KG	6700	U	67000	U	33000	U	33000	U	7000	10000		
Chloroethane	UG/KG	6700	U	67000	U	33000	U	33000	U				
Methylene Chloride	UG/KG	3400	U	34000	U	17000	U	17000	U	210000	1000		
Acetone	UG/KG	6700	U	67000	U	33000	U	33000	U	1000000	100000		
Carbon Disulfide	UG/KG	3400	U	34000	U	17000	U	17000	U				
1,1-Dichloroethene	UG/KG	3400	U	34000	U	17000	U	17000	U	150000	10000		
1,1-Dichloroethane	UG/KG	3400	U	34000	U	17000	U	17000	U	1000000	1000		
1,2-Dichloroethene(total)	UG/KG	3400	U	34000	U	17000	U	17000	U		50000		
Chloroform	UG/KG	3400	U	34000	U	17000	U	17000	U	28000	1000		
1,2-Dichloroethane	UG/KG	3400	U	34000	U	17000	U	17000	U	24000	1000		
2-Butanone	UG/KG	6700	U	67000	U	33000	U	33000	U	1000000	50000		
1,1,1-Trichloroethane	UG/KG	3400	U	34000	U	17000	U	17000	U	1000000	50000		
Carbon Tetrachloride	UG/KG	3400	U	34000	U	17000	U	17000	U	4000	1000		
Bromodichloromethane	UG/KG	3400	U	34000	U	17000	U	17000	U	46000	1000		
1,2-Dichloropropane	UG/KG	3400	U	34000	U	17000	U	17000	U	43000			
cis-1,3-Dichloropropene	UG/KG	3400	U	34000	U	17000	U	17000	U	5000	1000		
Trichloroethene	UG/KG	3400	U	34000	U	17000	U	17000	U	54000	1000		
Dibromochloromethane	UG/KG	3400	U	34000	U	17000	U	17000	U	1000000	1000		
1,1,2-Trichloroethane	UG/KG	3400	U	34000	U	17000	U	17000	U	420000	1000		
Benzene	UG/KG	3400	U	34000	U	17000	U	17000	U	13000	1000		
Trans-1,3-Dichloropropene	UG/KG	3400	U	34000	U	17000	U	17000	U	5000			
Bromoform	UG/KG	3400	U	34000	U	17000	U	17000	U	370000	1000		
4-Methyl-2-Pentanone	UG/KG	6700	U	67000	U	33000	U	33000	U	1000000	50000		
2-Hexanone	UG/KG	6700	U	67000	U	33000	U	33000	U				

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PARAMETERS	**UNITS**												
Tetrachloroethene	UG/KG	3400	U	34000	U	17000	U	17000	U	6000			
Toluene	UG/KG	3400	U	54000		32000		40000		1000000	500000		
1,1,2,2-Tetrachloroethane	UG/KG	3400	U	34000	U	17000	U	17000	U	70000	1000		
Chlorobenzene	UG/KG	7700		34000	U	17000	U	17000	U	680000	1000		
Ethylbenzene	UG/KG	14000		63000		32000		48000		1000000	100000		
Styrene	UG/KG	3400	U	34000	U	17000	U	17000	U	97000	100000		
Total Xylenes	UG/KG	20000		500000		230000		390000		1000000	10000		
VOLATILE TICS													
Cyclohexane, 1,2-Dimethyl-, Trans-	UG/KG					250000	JN						
Cyclohexane, Methyl-	UG/KG	250000	JN			330000	JN	330000	JN				
Unknown Cycloalkane	UG/KG	200000	J	670000	J	580000	J	420000	J				
1h-Indene,Dihydro-Methyl Isomer	UG/KG	130000	J					300000	J				
Ethyl Dimethyl Benzene Isomer	UG/KG	120000	J			260000	J	560000	J				
Ethylmethyl Benzene Isomer	UG/KG	94000	J	640000	J	230000	J	580000	J				
Unknown Alkane	UG/KG	100000	J	440000	J	580000	J	130000	J				
Methyl Propyl Benzene Isomer	UG/KG							300000	J				
Trimethyl Benzene Isomer	UG/KG			830000	J	260000	J	190000	J				
1h-Indene,Dihydro-Dimethyl Isomer	UG/KG												
Methyl Naphthalene Isomer	UG/KG												
Naphthalene	UG/KG	11000	J	70000		70000		180000		4200000		160	2100
Cyclohexane, 1-Ethyl-2-Methyl-, Cis- (8c	UG/KG												
Pentalene, Octahydro-2-Methyl-	UG/KG	120000	JN										
Diethyl Benzene Isomer	UG/KG												
Methyl Methylethyl Benzene Isomer	UG/KG			670000	J			280000	J				
Unknown Aromatic	UG/KG												
SEMI-VOLATILES										0			
Phenol	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000	50000		

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PARAMETERS	UNITS												
Bis(2-Chloroethyl)Ether	UG/KG	28000	U	28000	U	28000	U	28000	U	3000	10000		
2-Chlorophenol	UG/KG	28000	U	28000	U	28000	U	28000	U	5200000	10000		
1,3-Dichlorobenzene	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000	100000		
1,4-Dichlorobenzene	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000	100000		
1,2-Dichlorobenzene	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000	50000		
2-Methylphenol	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000			
2,2'-Oxybis(1-Chloropropane)	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000			
4-Methylphenol	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000			
N-Nitrosodi-n-Propylamine	UG/KG	28000	U	28000	U	28000	U	28000	U	660	100000		
Hexachloroethane	UG/KG	28000	U	28000	U	28000	U	28000	U	100000	100000		
Nitrobenzene	UG/KG	28000	U	28000	U	28000	U	28000	U	520000	10000		
Isophorone	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000	50000		
2-Nitrophenol	UG/KG	28000	U	28000	U	28000	U	28000	U				
2,4-Dimethylphenol	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000			
Bis(2-Chloroethoxy) Methane	UG/KG	28000	U	28000	U	28000	U	28000	U				
2,4-Dichlorophenol	UG/KG	28000	U	28000	U	28000	U	28000	U	3100000	10000		
1,2,4-Trichlorobenzene	UG/KG	28000	U	28000	U	28000	U	28000	U	1200000	100000		
4-Chloroaniline	UG/KG	28000	U	28000	U	28000	U	28000	U	4200000			
Hexachlorobutadiene	UG/KG	28000	U	28000	U	28000	U	28000	U	21000	100000		
4-Chloro-3-Methylphenol	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000			
Hexachlorocyclopentadiene	UG/KG	28000	U	28000	U	28000	U	28000	U	7300000	100000		
2,4,6-Trichlorophenol	UG/KG	28000	U	28000	U	28000	U	28000	U	270000	10000		
2,4,5-Trichlorophenol	UG/KG	140000	U	140000	U	140000	U	140000	U	10000000	50000		
2-Chloronaphthalene	UG/KG	28000	U	28000	U	28000	U	28000	U				
2-Nitroaniline	UG/KG	140000	U	140000	U	140000	U	140000	U				
Dimethylphthalate	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000			
2,6-Dinitrotoluene	UG/KG	28000	U	28000	U	28000	U	28000	U	0			

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PARAMETERS	UNITS												
3-Nitroaniline	UG/KG	140000	U	140000	U	140000	U	140000	U				
2,4-Dinitrophenol	UG/KG	140000	U	140000	U	140000	U	140000	U	2100000	10000		
4-Nitrophenol	UG/KG	140000	U	140000	U	140000	U	140000	U				
Dibenzofuran	UG/KG	28000	U	28000	U	28000	U	28000	U				
2,4-Dinitrotoluene	UG/KG	28000	U	28000	U	28000	U	28000	U		10000		
Diethylphthalate	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000	50000		
4-Chlorophenyl-Phenyl Ether	UG/KG	28000	U	28000	U	28000	U	28000	U				
4-Nitroaniline	UG/KG	140000	U	140000	U	140000	U	140000	U				
4,6-Dinitro-2-Methylphenol	UG/KG	140000	U	140000	U	140000	U	140000	U	0			
N-Nitrosodiphenylamine (1)	UG/KG	28000	U	28000	U	28000	U	28000	U	600000	100000		
4-Bromophenyl-Phenylether	UG/KG	28000	U	28000	U	28000	U	28000	U				
Hexachlorobenzene	UG/KG	28000	U	28000	U	28000	U	28000	U	2000	100000		
Pentachlorophenol	UG/KG	140000	U	140000	U	140000	U	140000	U	24000	100000		
Carbazole	UG/KG	28000	U	28000	U	28000	U	28000	U				
Di-n-Butylphthalate	UG/KG	28000	U	28000	U	5000	J	28000	U	10000000	100000		
Butylbenzylphthalate	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000	100000		
3,3'-Dichlorobenzidine	UG/KG	28000	U	28000	U	28000	U	28000	U	6000	100000		
Bis(2-Ethylhexyl)Phthalate	UG/KG	8000	J	28000	U	28000	U	5800	J	210000	100000		
Di-n-Octylphthalate	UG/KG	28000	U	28000	U	28000	U	28000	U	10000000	100000		
Benzo(b)Fluoranthene	UG/KG	28000	U	28000	U	6100	J	9500	J	4000	100000		
Benzo(k)Fluoranthene	UG/KG	28000	U	2900	J	28000	U	3100	J	4000	50000		
Indeno(1,2,3-cd)Pyrene	UG/KG	28000	U	28000	U	28000	U	28000	U	4000	500000		
Benzo(g,h,i)Perylene	UG/KG	28000	U	28000	U	3100	J	7600	J	0	500000		
Acenaphthylene	UG/KG	28000	U	28000	U	28000	U	28000	U				
Naphthalene	UG/KG	11000	J	70000		70000		180000		4200000		160	2100
2-Methylnaphthalene	UG/KG	31000		260000		340000		530000	E		100000	70	670
Acenaphthene	UG/KG	6800	J	13000	J	10000	J	23000	J	10000000		16	500

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED23A 62372008 06/06/96 SLUDGE		PKCSED23B 62372009 06/06/96 SLUDGE		PKCSED23C 62372010 06/06/96 SLUDGE		PKCSED23D 62372011 06/06/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	**UNITS**												
Fluorene	UG/KG	9900	J	38000		46000		77000		10000000	100000	19	540
Phenanthrene	UG/KG	26000	J	58000		61000		130000		0	100000	240	1500
Anthracene	UG/KG	4600	J	8300	J	12000	J	36000		10000000	100000	85.3	1100
Fluoranthene	UG/KG	4700	J	8400	J	12000	J	17000	J	10000000	100000	600	5100
Pyrene	UG/KG	7100	J	14000	J	20000	J	38000		10000000	100000	665	2600
Benzo(a)Anthracene	UG/KG	28000	U	5700	J	10000	J	14000	J	4000	100000	261	1600
Chrysene	UG/KG	4300	J	10000	J	11000	J	23000	J	40000	500000	384	2800
Benzo(a)Pyrene	UG/KG	28000	U	3800	J	5500	J	10000	J	660	500000	430	1600
Dibenz(a,h)Anthracene	UG/KG	28000	U	28000	U	28000	U	28000	U	660	100000		
SEMI-VOLATILE TICS													
Dimethyl Naphthalene Isomer	UG/KG	57000	J	64000	J								
Naphthalene, Trimethyl- Isomer	UG/KG	78000	J										
Unknown	UG/KG												
Unknown Alkane	UG/KG	100000	J	440000	J	580000	J	130000	J				
Unknown Aromatic	UG/KG												
Unknown Cycloalkane	UG/KG	200000	J	670000	J	580000	J	420000	J				
Unknown Pah	UG/KG	42000	J					100000	J				
Anthracene, Methyl- Isomer	UG/KG												
Decahydro-4,4,8,9,10-Pentamethylnap	UG/KG	41000	JN										
Unknown Hydrocarbon	UG/KG	42000	J					89000	J				
Methyl Methylethyl Benzene Isomer	UG/KG			670000	J			280000	J				
Naphthalene, Trimethyl Isomer	UG/KG												
Trimethyl Benzene Isomer	UG/KG			830000	J	260000	J	190000	J				
Tetramethyl Benzene Isomer	UG/KG												
9h-Fluorene, Methyl- Isomer	UG/KG	36000	J										
Naphthalene, Ethyl- Isomer	UG/KG												

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
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PARAMETERS	**UNITS**												
PESTICIDES/PCB's										0			
alpha BHC	UG/KG	92	U	92	U	18	U	92	U	0			
beta BHC	UG/KG	92	U	92	U	18	U	92	U	0			
delta BHC	UG/KG	380		92	U	18	U	92	U				
gamma BHC	UG/KG	92	U	92	U	21		56	J	0			
Heptachlor	UG/KG	92	U	92	U	18	U	58	J	650	50000		
Aldrin	UG/KG	92	U	43	J	26		92	U	170	50000		
Heptachlor epoxide	UG/KG	92	U	92	U	18	U	92	U				
Endosulfan I	UG/KG	92	U	92	U	18	U	92	U	0	50000		
Dieldrin	UG/KG	180	U	220		100		180	U	180	50000		
4,4'-DDE	UG/KG	180	U	900		29	J	970		9000	50000		
Endrin	UG/KG	590		180	U	37	U	180	U	310000	50000		
Endosulfan II	UG/KG	180	U	180	U	37	U	180	U	6200000			
4,4'-DDD	UG/KG	1200		3400		93		2000		12000	50000		
Endosulfan sulfate	UG/KG	190		180	U	17	J	180	U				
4,4'-DDT	UG/KG	180	U	180	U	38		180	U	9000	50000		
Methoxychlor	UG/KG	920	U	920	U	180	U	920	U	5200000	50000		
Endrin ketone	UG/KG	180	U	180	U	37	U	180	U				
Endrin Aldehyde	UG/KG	180	U	180	U	37	U	180	U				
alpha-Chlordane	UG/KG	100		60	J	18	U	42	J				
gamma-Chlordane	UG/KG	370		92	U	24		39	J				
Toxaphene	UG/KG	3700	U	3700	U	740	U	3700	U	200	50000		
Aroclor-1016	UG/KG	1800	U	1800	U	370	U	1800	U				
Aroclor-1221	UG/KG	1800	U	1800	U	370	U	1800	U				
Aroclor-1232	UG/KG	1800	U	1800	U	370	U	1800	U				
Aroclor-1242	UG/KG	1800	U	1800	U	370	U	1800	U				
Aroclor-1248	UG/KG	1800	U	1800	U	370	U	1800	U				

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
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PARAMETERS	UNITS								
Aroclor-1254	UG/KG	1800 U	1800 U	370 U	1800 U				
Aroclor-1260	UG/KG	1800 U	1800 U	370 U	1800 U				
METALS						0			
Aluminum	MG/KG	16000	20700	28500	21200	0			
Antimony	MG/KG	3 B	3.4 B	5.1 B	2.7 B	340			
Arsenic	MG/KG	104	123	251	162	20		8.2	70
Barium	MG/KG	480	200	288	241	47000			
Beryllium	MG/KG	1 B	1.4	1.8	1.5	1			
Cadmium	MG/KG	14.6	7.9	4.9	8.5	100		1.2	9.6
Calcium	MG/KG	6320	3560	3480	4580				
Chromium	MG/KG	472	341	251	382	0		81	370
Cobalt	MG/KG	15.4	11.5 B	12.8 B	14.2				
Copper	MG/KG	740	500	521	600	600		34	270
Iron	MG/KG	38800	34900	33900	40200	0			
Lead	MG/KG	2580	1320	2800	2200	600		46.7	218
Magnesium	MG/KG	7850	6990	7170	8040				
Manganese	MG/KG	306	285	320	361	0		0.15	0.71
Mercury	MG/KG	12.6	8.3	7.2	8.4	270		20.9	51.6
Nickel	MG/KG	108	47.8	49.9	65	2400			
Potassium	MG/KG	4010	3630	3790	4040				
Selenium	MG/KG	4.4	3.9	9.1	6.8	3100			
Silver	MG/KG	10.5	7.4	4.5	7.7	4100		1	3.7

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
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CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED23A 62372008 06/06/96 SLUDGE	PKCSED23B 62372009 06/06/96 SLUDGE	PKCSED23C 62372010 06/06/96 SLUDGE	PKCSED23D 62372011 06/06/96 SLUDGE	Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	UNITS								
Sodium	MG/KG	11200	11300	9330	11200	0			
Thallium	MG/KG	3.6	3.3	4.8	4.2	2			
Vanadium	MG/KG	117	68.8	107	78	7100			
Zinc	MG/KG	1010	605	659	779	1500		150	410

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT I
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX: PARAMETERS	UNITS	PKCSED25A 62404002 06/07/96 SLUDGE		PKCSED25B 62404003 06/07/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
VOLATILES									
Chloromethane	UG/KG	2700	U	5800	U	1000000	10000		
Bromomethane	UG/KG	2700	U	5800	U	1000000	1000		
Vinyl Chloride	UG/KG	2700	U	5800	U	7000	10000		
Chloroethane	UG/KG	2700	U	5800	U				
Methylene Chloride	UG/KG	1400	U	3000	U	210000	1000		
Acetone	UG/KG	2700	U	5800	U	1000000	100000		
Carbon Disulfide	UG/KG	1400	U	3000	U				
1,1-Dichloroethene	UG/KG	1400	U	3000	U	150000	10000		
1,1-Dichloroethane	UG/KG	1400	U	3000	U	1000000	1000		
1,2-Dichloroethene(total)	UG/KG	1400	U	3000	U		50000		
Chloroform	UG/KG	1400	U	3000	U	28000	1000		
1,2-Dichloroethane	UG/KG	1400	U	3000	U	24000	1000		
2-Butanone	UG/KG	2700	U	5800	U	1000000	50000		
1,1,1-Trichloroethane	UG/KG	1400	U	3000	U	1000000	50000		
Carbon Tetrachloride	UG/KG	1400	U	3000	U	4000	1000		
Bromodichloromethane	UG/KG	1400	U	3000	U	46000	1000		
1,2-Dichloropropane	UG/KG	1400	U	3000	U	43000			
cis-1,3-Dichloropropene	UG/KG	1400	U	3000	U	5000	1000		
Trichloroethene	UG/KG	1400	U	3000	U	54000	1000		
Dibromochloromethane	UG/KG	1400	U	3000	U	1000000	1000		
1,1,2-Trichloroethane	UG/KG	1400	U	3000	U	420000	1000		
Benzene	UG/KG	1400	U	3000	U	13000	1000		
Trans-1,3-Dichloropropene	UG/KG	1400	U	3000	U	5000			
Bromoform	UG/KG	1400	U	3000	U	370000	1000		
4-Methyl-2-Pentanone	UG/KG	2700	U	5800	U	1000000	50000		

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
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CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED25A 62404002 06/07/96 SLUDGE		PKCSED25B 62404003 06/07/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	**UNITS**								
2-Hexanone	UG/KG	2700	U	5800	U				
Tetrachloroethene	UG/KG	1400	U	3000	U	6000			
Toluene	UG/KG	1400	U	3000	U	1000000	500000		
1,1,2,2-Tetrachloroethane	UG/KG	1400	U	3000	U	70000	1000		
Chlorobenzene	UG/KG	4200		3000	U	680000	1000		
Ethylbenzene	UG/KG	1400	U	3000	U	1000000	100000		
Styrene	UG/KG	1400	U	3000	U	97000	100000		
Total Xylenes	UG/KG	1400	U	3000	U	1000000	10000		
VOLATILE TICS									
Methyl Propyl Benzene Isomer	UG/KG	31000	J						
Unknown Alkane	UG/KG	31000	J	120000	J				
Unknown Aromatic	UG/KG	31000	J						
Unknown Cycloalkane	UG/KG	31000	J	100000	J				
Unknown Hydrocarbon	UG/KG	31000	J						
Cyclohexane, 1,2-Dimethyl-, Trans-	UG/KG	120000	JN	120000	JN				
Cyclohexane, Methyl-	UG/KG	140000	JN	140000	JN				
Ethylmethyl Benzene Isomer	UG/KG	31000	J						
Cyclohexane(Dot	UG/KG	370000	JN						
Ethyl Dimethyl Benzene Isomer	UG/KG	31000	J						
Trimethyl Benzene Isomer	UG/KG	31000	J						
SEMI-VOLATILES						0			
Phenol	UG/KG	22000	U	24000	U	10000000	50000		
Bis(2-Chloroethyl)Ether	UG/KG	22000	U	24000	U	3000	10000		
2-Chlorophenol	UG/KG	22000	U	24000	U	5200000	10000		
1,3-Dichlorobenzene	UG/KG	22000	U	24000	U	10000000	100000		
1,4-Dichlorobenzene	UG/KG	22000	U	24000	U	10000000	100000		
1,2-Dichlorobenzene	UG/KG	22000	U	24000	U	10000000	50000		
2-Methylphenol	UG/KG	22000	U	24000	U	10000000			
2,2'-Oxybis(1-Chloropropane)	UG/KG	22000	U	24000	U	10000000			

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PARAMETERS	UNITS								
4-Methylphenol	UG/KG	22000	U	24000	U	10000000			
N-Nitrosodi-n-Propylamine	UG/KG	22000	U	24000	U	660	100000		
Hexachloroethane	UG/KG	22000	U	24000	U	100000	100000		
Nitrobenzene	UG/KG	22000	U	24000	U	520000	10000		
Isophorone	UG/KG	22000	U	24000	U	10000000	50000		
2-Nitrophenol	UG/KG	22000	U	24000	U				
2,4-Dimethylphenol	UG/KG	22000	U	24000	U	10000000			
Bis(2-Chloroethoxy) Methane	UG/KG	22000	U	24000	U				
2,4-Dichlorophenol	UG/KG	22000	U	24000	U	3100000	10000		
1,2,4-Trichlorobenzene	UG/KG	22000	U	24000	U	1200000	100000		
4-Chloroaniline	UG/KG	22000	U	24000	U	4200000			
Hexachlorobutadiene	UG/KG	22000	U	24000	U	21000	100000		
4-Chloro-3-Methylphenol	UG/KG	22000	U	24000	U	10000000			
Hexachlorocyclopentadiene	UG/KG	22000	U	24000	U	7300000	100000		
2,4,6-Trichlorophenol	UG/KG	22000	U	24000	U	270000	10000		
2,4,5-Trichlorophenol	UG/KG	110000	U	120000	U	10000000	50000		
2-Chloronaphthalene	UG/KG	22000	U	24000	U				
2-Nitroaniline	UG/KG	110000	U	120000	U				
Dimethylphthalate	UG/KG	22000	U	24000	U	10000000			
2,6-Dinitrotoluene	UG/KG	22000	U	24000	U	0			
3-Nitroaniline	UG/KG	110000	U	120000	U				
2,4-Dinitrophenol	UG/KG	110000	U	120000	U	2100000	10000		
4-Nitrophenol	UG/KG	110000	U	120000	U				
Dibenzofuran	UG/KG	6300	J	24000	U				
2,4-Dinitrotoluene	UG/KG	22000	U	24000	U		10000		
Diethylphthalate	UG/KG	3100	J	24000	U	10000000	50000		
4-Chlorophenyl-Phenyl Ether	UG/KG	22000	U	24000	U				
4-Nitroaniline	UG/KG	110000	U	120000	U				
4,6-Dinitro-2-Methylphenol	UG/KG	110000	U	120000	U	0			

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PARAMETERS	UNITS								
N-Nitrosodiphenylamine (1)	UG/KG	22000	U	24000	U	600000	100000		
4-Bromophenyl-Phenylether	UG/KG	22000	U	24000	U				
Hexachlorobenzene	UG/KG	22000	U	24000	U	2000	100000		
Pentachlorophenol	UG/KG	110000	U	120000	U	24000	100000		
Phenanthrene	UG/KG	47000		42000		0		240	1500
Carbazole	UG/KG	22000	U	24000	U				
Di-n-Butylphthalate	UG/KG	22000	U	24000	U	10000000	100000		
Butylbenzylphthalate	UG/KG	22000	U	24000	U	10000000	100000		
3,3'-Dichlorobenzidine	UG/KG	22000	U	24000	U	6000	100000		
Bis(2-Ethylhexyl)Phthalate	UG/KG	12000	J	9900	J	210000	100000		
Di-n-Octylphthalate	UG/KG	22000	U	24000	U	10000000	100000		
Dibenz(a,h)Anthracene	UG/KG	22000	U	24000	U	0.66	100000		
Benzo(b)Fluoranthene	UG/KG	5000	J	11000	J	4000	50000		
Benzo(k)Fluoranthene	UG/KG	2500	J	24000	U	4000	500000		
Indeno(1,2,3-cd)Pyrene	UG/KG	22000	U	24000	U	4000	500000		
Benzo(g,h,i)Perylene	UG/KG	2900	J	4100	J	0			
Acenaphthylene	UG/KG	22000	U	24000	U				
Naphthalene	UG/KG	22000	U	24000	U	4200000	100000	160	2100
2-Methylnaphthalene	UG/KG	22000	U	24000	U			70	670
Acenaphthene	UG/KG	28000		110000		10000000	100000	16	500
Fluorene	UG/KG	22000	U	24000	U	10000000	100000	19	540
Anthracene	UG/KG	25000		51000		10000000	100000	85.3	1100
Fluoranthene	UG/KG	29000		95000		10000000	100000	600	5100
Pyrene	UG/KG	48000		78000		10000000	100000	665	2600
Benzo(a)Anthracene	UG/KG	12000	J	22000	J	4000	500000	261	1600
Chrysene	UG/KG	21000	J	34000		40000	500000	384	2800
Benzo(a)Pyrene	UG/KG	7900	J	9600	J	660	100000	430	1600
SEMI-VOLATILE TICS									

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PARAMETERS	UNITS								
Dimethyl Naphthalene Isomer	UG/KG	4000	J						
Naphthalene, 2,3,6-Trimethyl- Isomer	UG/KG	4000	J						
Phenanthrene, 2,5-Dimethyl- Isomer	UG/KG	4000	J						
Trimethyl Naphthalene Isomer	UG/KG	4000	J	98000	J				
Unknown Alkane	UG/KG	4000	J	120000	J				
Unknown Aromatic	UG/KG	4000	J						
Unknown Pah	UG/KG	4000	J						
Cyclohexane, 1,2,4-Trimethyl- Isomer	UG/KG	4000	J	140000	J				
Naphthalene, Decahydro-, Isomer	UG/KG	4000	J	310000	J				
Unknown	UG/KG	4000	J	240000	J				
Unknown Cycloalkane	UG/KG	4000	J	100000	J				
Anthracene, 9-Methyl- Isomer	UG/KG	4000	J						
Phenanthrene, 2,3-Dimethyl- Isomer	UG/KG	4000	J						
Phenanthrene, 3,6-Dimethyl- Isomer	UG/KG	4000	J						
Benzene, 1,2,3-Trimethyl- Isomer	UG/KG	4000	J						
Cyclohexane, 1,1,2-Trimethyl- Isomer	UG/KG	4000	J						
Cyclohexane, 1,3-Dimethyl-, Isomer	UG/KG	4000	J						
Tetramethyl Benzene Isomer	UG/KG	4000	J						
PESTICIDES/PCB's						0			
alpha BHC	UG/KG	37	U	86		0			
beta BHC	UG/KG	37	U	41	U	0			
delta BHC	UG/KG	250		41	U				
gamma BHC	UG/KG	37	U	41	U	0			
Heptachlor	UG/KG	37	U	41	U	650	50000		
Aldrin	UG/KG	37	U	41	U	170	50000		
Heptachlor epoxide	UG/KG	37	U	41	U				
Endosulfan I	UG/KG	37	U	41	U	0	50000		
Dieldrin	UG/KG	860		310		180	50000		

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX: PARAMETERS	UNITS	PKCSED25A 62404002 06/07/96 SLUDGE		PKCSED25B 62404003 06/07/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
4,4'-DDE	UG/KG	550		410		9000	50000		
Endrin	UG/KG	74	U	81	U	310000	50000		
Endosulfan II	UG/KG	74	U	81	U	6200000			
4,4'-DDD	UG/KG	1300		1100		12000	50000		
Endosulfan sulfate	UG/KG	190		23	J				
4,4'-DDT	UG/KG	150		81	U	9000	500000		
Methoxychlor	UG/KG	370	U	410	U	5200000	50000		
Endrin ketone	UG/KG	74	U	81	U				
Endrin Aldehyde	UG/KG	74	U	81	U				
alpha-Chlordane	UG/KG	400		120					
gamma-Chlordane	UG/KG	520		120					
Toxaphene	UG/KG	1500	U	1600	U	200	50000		
Aroclor-1016	UG/KG	740	U	810	U				
Aroclor-1221	UG/KG	740	U	810	U				

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED25A 62404002 06/07/96 SLUDGE		PKCSED25B 62404003 06/07/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	**UNITS**								
Aroclor-1232	UG/KG	740	U	810	U				
Aroclor-1242	UG/KG	740	U	810	U				
Aroclor-1248	UG/KG	740	U	810	U				
Aroclor-1254	UG/KG	740	U	810	U				
Aroclor-1260	UG/KG	740	U	810	U				
METALS						0			
Aluminum	MG/KG	19300		15900		0			
Antimony	MG/KG	18.5	B	2.6	B	340			
Arsenic	MG/KG	629		99.9		20		8.2	70
Barium	MG/KG	965		162		47000			
Beryllium	MG/KG	1.2	B	1.2		1			
Cadmium	MG/KG	5.6		12		100		1.2	9.6
Calcium	MG/KG	13500		5420		0			
Chromium	MG/KG	449		534		0		81	370
Cobalt	MG/KG	86.4		15		0			
Copper	MG/KG	1500		729		600		34	270
Magnesium	MG/KG	6620		6520		0			
Manganese	MG/KG	2090		1290		0			
Nickel	MG/KG	273		79.9		2400		20.9	51.6
Potassium	MG/KG	3250		3730		0			
Selenium	MG/KG	21.9		3.4		3100			
Silver	MG/KG	5.6		9.9		4100		1	3.7
Sodium	MG/KG	3580		2830		0			
Thallium	MG/KG	4.7		1.4	B	2			
Vanadium	MG/KG	259		132		7100			
Zinc	MG/KG	1530		837		1500		150	410
Mercury	MG/KG	13.2		7.7		270		0.15	0.71
Iron	MG/KG	189000		50500		0			

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX:		PKCSED25A 62404002 06/07/96 SLUDGE	PKCSED25B 62404003 06/07/96 SLUDGE	Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
PARAMETERS	UNITS						
Lead	MG/KG	11600	4860	600		46.7	218

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

CLIENT ID: LAB ID: SAMPLING DATE: MATRIX: PARAMETERS	UNITS	PKCSED27A 62404008 06/07/96 SLUDGE		PKCSED27B 62404009 06/07/96 SLUDGE		PKCSED27C 62404010 06/07/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
VOLATILES											
Chloromethane	UG/KG	6500	U	34000	U	38000	U	1000000	10000		
Bromomethane	UG/KG	6500	U	34000	U	38000	U	1000000	1000		
Vinyl Chloride	UG/KG	6500	U	34000	U	38000	U	7000	10000		
Chloroethane	UG/KG	6500	U	34000	U	38000	U				
Methylene Chloride	UG/KG	3400	U	18000	U	19000	U	210000	1000		
Acetone	UG/KG	6500	U	34000	U	38000	U	1000000	100000		
Carbon Disulfide	UG/KG	3400	U	18000	U	19000	U				
1,1-Dichloroethene	UG/KG	3400	U	18000	U	19000	U	150000	10000		
1,1-Dichloroethane	UG/KG	3400	U	18000	U	19000	U	1000000	1000		
1,2-Dichloroethene(total)	UG/KG	3400	U	18000	U	19000	U		50000		
Chloroform	UG/KG	3400	U	18000	U	19000	U	28000	1000		
1,2-Dichloroethane	UG/KG	3400	U	18000	U	19000	U	24000	1000		
2-Butanone	UG/KG	6500	U	34000	U	38000	U	1000000	50000		
1,1,1-Trichloroethane	UG/KG	3400	U	18000	U	19000	U	1000000	50000		
Carbon Tetrachloride	UG/KG	3400	U	18000	U	19000	U	4000	1000		
Bromodichloromethane	UG/KG	3400	U	18000	U	19000	U	46000	1000		
1,2-Dichloropropane	UG/KG	3400	U	18000	U	19000	U	43000			
cis-1,3-Dichloropropene	UG/KG	3400	U	18000	U	19000	U	5000	1000		
Trichloroethene	UG/KG	3400	U	18000	U	19000	U	54000	1000		
Dibromochloromethane	UG/KG	3400	U	18000	U	19000	U	1000000	1000		
1,1,2-Trichloroethane	UG/KG	3400	U	18000	U	19000	U	420000	1000		
Benzene	UG/KG	3400	U	18000	U	19000	U	13000	1000		
Trans-1,3-Dichloropropene	UG/KG	3400	U	18000	U	19000	U	5000			
Bromoform	UG/KG	3400	U	18000	U	19000	U	370000	1000		
4-Methyl-2-Pentanone	UG/KG	6500	U	34000	U	38000	U	1000000	50000		
2-Hexanone	UG/KG	6500	U	34000	U	38000	U				

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CLIENT ID: LAB ID: SAMPLING DATE: MATRIX: PARAMETERS	UNITS	PKCSED27A 62404008 06/07/96 SLUDGE		PKCSED27B 62404009 06/07/96 SLUDGE		PKCSED27C 62404010 06/07/96 SLUDGE		Non-Residential Direct Contact Soil Cleanup Criteria 7/11/96	Impact to Ground Water Soil Cleanup Criteria	EFFECTS RANGE LOW (ERL) Guidelines from Long et. al.	EFFECTS RANGE MEDIAN (ERM) Guidelines from Long et. al.
Tetrachloroethene	UG/KG	3400	U	18000	U	19000	U	6000			
Toluene	UG/KG	3400	U	18000	U	35000		1000000	500000		
1,1,2,2-Tetrachloroethane	UG/KG	3400	U	18000	U	19000	U	70000	1000		
Chlorobenzene	UG/KG	8300		18000	U	19000	U	680000	1000		
Ethylbenzene	UG/KG	24000		71000		48000		1000000	100000		
Styrene	UG/KG	3400	U	18000	U	19000	*U	97000	100000		
Total Xylenes	UG/KG	25000		490000		330000		1000000	10000		
VOLATILE TICS											
Methyl Propyl Benzene Isomer	UG/KG										
Unknown Alkane	UG/KG	86000	J	120000	J	840000	J				
Unknown Aromatic	UG/KG	140000	J								
Unknown Cycloalkane	UG/KG	320000	J	370000	J	340000	J				
Unknown Hydrocarbon	UG/KG										
Cyclohexane, 1,2-Dimethyl-, Trans-	UG/KG										
Cyclohexane, Methyl-	UG/KG	380000	JN	1200000	JN	340000	JN				
Ethylmethyl Benzene Isomer	UG/KG	160000	J	600000	J	380000	J				
Cyclohexane(Dot	UG/KG			370000	JN						
Ethyl Dimethyl Benzene Isomer	UG/KG			630000	J	470000	J				
Trimethyl Benzene Isomer	UG/KG					500000	J				
SEMI-VOLATILES								0			
Phenol	UG/KG	27000	U	28000	U	31000	U	10000000	50000		
Bis(2-Chloroethyl)Ether	UG/KG	27000	U	28000	U	31000	U	3000	10000		
2-Chlorophenol	UG/KG	27000	U	28000	U	31000	U	5200000	10000		
1,3-Dichlorobenzene	UG/KG	27000	U	28000	U	31000	U	10000000	100000		
1,4-Dichlorobenzene	UG/KG	27000	U	28000	U	31000	U	10000000	100000		
1,2-Dichlorobenzene	UG/KG	27000	U	28000	U	31000	U	10000000	50000		
2-Methylphenol	UG/KG	27000	U	28000	U	31000	U	10000000			
2,2'-Oxybis(1-Chloropropane)	UG/KG	27000	U	28000	U	31000	U	10000000			

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4-Methylphenol	UG/KG	27000	U	28000	U	31000	U	10000000			
N-Nitrosodi-n-Propylamine	UG/KG	27000	U	28000	U	31000	U	660	100000		
Hexachloroethane	UG/KG	27000	U	28000	U	31000	U	100000	100000		
Nitrobenzene	UG/KG	27000	U	28000	U	31000	U	520000	10000		
Isophorone	UG/KG	27000	U	28000	U	31000	U	10000000	50000		
2-Nitrophenol	UG/KG	27000	U	28000	U	31000	U				
2,4-Dimethylphenol	UG/KG	27000	U	28000	U	31000	U	10000000			
Bis(2-Chloroethoxy) Methane	UG/KG	27000	U	28000	U	31000	U				
2,4-Dichlorophenol	UG/KG	27000	U	28000	U	31000	U	3100000	10000		
1,2,4-Trichlorobenzene	UG/KG	27000	U	28000	U	31000	U	1200000	100000		
4-Chloroaniline	UG/KG	27000	U	28000	U	31000	U	4200000			
Hexachlorobutadiene	UG/KG	27000	U	28000	U	31000	U	21000	100000		
4-Chloro-3-Methylphenol	UG/KG	27000	U	28000	U	31000	U	10000000			
Hexachlorocyclopentadiene	UG/KG	27000	U	28000	U	31000	U	7300000	100000		
2,4,6-Trichlorophenol	UG/KG	27000	U	28000	U	31000	U	270000	10000		
2,4,5-Trichlorophenol	UG/KG	140000	U	140000	U	160000	U	10000000	50000		
2-Chloronaphthalene	UG/KG	27000	U	28000	U	31000	U				
2-Nitroaniline	UG/KG	140000	U	140000	U	160000	U				
Dimethylphthalate	UG/KG	27000	U	28000	U	31000	U	10000000			
2,6-Dinitrotoluene	UG/KG	27000	U	28000	U	31000	U	0			
3-Nitroaniline	UG/KG	140000	U	140000	U	160000	U				
2,4-Dinitrophenol	UG/KG	140000	U	140000	U	160000	U	2100000	10000		
4-Nitrophenol	UG/KG	140000	U	140000	U	160000	U				
Dibenzofuran	UG/KG	11000	J	28000	U	66000					
2,4-Dinitrotoluene	UG/KG	27000	U	28000	U	31000	U		10000		
Diethylphthalate	UG/KG	7900	J	28000	U	31000	U	10000000	50000		
4-Chlorophenyl-Phenyl Ether	UG/KG	27000	U	28000	U	31000	U				
4-Nitroaniline	UG/KG	140000	U	140000	U	160000	U				

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
Platty Kill Canal Phase 2 Sediment Investigation
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4,6-Dinitro-2-Methylphenol	UG/KG	140000	U	140000	U	160000	U	0			
N-Nitrosodiphenylamine (1)	UG/KG	27000	U	28000	U	31000	U	600000	100000		
4-Bromophenyl-Phenylether	UG/KG	27000	U	28000	U	31000	U				
Hexachlorobenzene	UG/KG	27000	U	28000	U	31000	U	2000	100000		
Pentachlorophenol	UG/KG	140000	U	140000	U	160000	U	24000	100000		
Carbazole	UG/KG	27000	U	28000	U	31000	U				
Di-n-Butylphthalate	UG/KG	27000	U	28000	U	56000		10000000			
Butylbenzylphthalate	UG/KG	27000	U	28000	U	31000	U	10000000	100000		
3,3'-Dichlorobenzidine	UG/KG	27000	U	28000	U	31000	U	6000	100000		
Bis(2-Ethylhexyl)Phthalate	UG/KG	22000	J	28000	U	31000	U	210000	100000		
Di-n-Octylphthalate	UG/KG	27000	U	28000	U	31000	U	10000000	100000		
Benzo(b)Fluoranthene	UG/KG	2800	J	12000	J	8000	J	4000	100000		
Benzo(k)Fluoranthene	UG/KG	27000	U	3100	J	31000	U	4000	100000		
Indeno(1,2,3-cd)Pyrene	UG/KG	27000	U	2900	J	31000	U	4000	50000		
Benzo(g,h,i)Perylene	UG/KG	27000	U	4200	J	31000	U	0	500000		
Acenaphthylene	UG/KG	27000	U	28000	U	31000	U		500000		
Naphthalene	UG/KG	28000		220000		160000		4200000		160	2100
2-Methylnaphthalene	UG/KG	120000		720000	E	540000	E			70	670
Acenaphthene	UG/KG	14000	J	36000		31000	U	10000000	100000	16	500
Fluorene	UG/KG	25000	J	110000		130000		10000000		19	540
Phenanthrene	UG/KG	64000		170000		99000		0	100000	240	1500
Anthracene	UG/KG	11000	J	53000		21000	J	10000000	100000	85.3	1100
Fluoranthene	UG/KG	9000	J	34000		17000	J	10000000	100000	600	5100
Pyrene	UG/KG	17000	J	56000		36000		10000000	100000	665	2600
Benzo(a)Anthracene	UG/KG	5300	J	25000	J	15000	J	4000	100000	261	1600
Chrysene	UG/KG	9700	J	48000		24000	J	40000	500000	384	2800
Benzo(a)Pyrene	UG/KG	3400	J	14000	J	9900	J	660	500000	430	1600
Dibenz(a,h)Anthracene	UG/KG	27000	U	28000	U	31000	U	660	100000		

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT

Platty Kill Canal Phase 2 Sediment Investigation
Bayonne Industries, Inc.
Bayonne, New Jersey

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SEMI-VOLATILE TICS								
Dimethyl Naphthalene Isomer	UG/KG	79000 J						
Naphthalene, 2,3,6-Trimethyl- Isomer	UG/KG							
Phenanthrene, 2,5-Dimethyl- Isomer	UG/KG							
Trimethyl Naphthalene Isomer	UG/KG	59000 J						
Unknown Alkane	UG/KG	86000 J	120000 J	840000 J				
Unknown Aromatic	UG/KG	140000 J						
Unknown Pah	UG/KG	54000 J	230000 J					
Cyclohexane, 1,2,4-Trimethyl- Isomer	UG/KG							
Naphthalene, Decahydro-, Isomer	UG/KG							
Unknown	UG/KG		130000 J					
Unknown Cycloalkane	UG/KG	320000 J	370000 J	340000 J				
Anthracene, 9-Methyl- Isomer	UG/KG	46000 J						
Phenanthrene, 2,3-Dimethyl- Isomer	UG/KG	60000 J						
Phenanthrene, 3,6-Dimethyl- Isomer	UG/KG	47000 J						
Benzene, 1,2,3-Trimethyl- Isomer	UG/KG		300000 J					
Cyclohexane, 1,1,2-Trimethyl- Isomer	UG/KG		130000 J					
Cyclohexane, 1,3-Dimethyl-, Isomer	UG/KG		130000 J					
Tetramethyl Benzene Isomer	UG/KG		120000 J					
PESTICIDES/PCB's					0			
alpha BHC	UG/KG	180 U	190 U	52 U	0			
beta BHC	UG/KG	180 U	190 U	52 U	0			
delta BHC	UG/KG	180 U	170 J	52 U				
gamma BHC	UG/KG	180 U	190 U	36 J	0			
Heptachlor	UG/KG	180 U	120 J	52 U	650	50000		
Aldrin	UG/KG	180 U	190 U	28 J	170	50000		
Heptachlor epoxide	UG/KG	180 U	190 U	26 J				
Endosulfan I	UG/KG	180 U	190 U	52 U	0	50000		

TABLE 3: SUMMARY OF ANALYTICAL RESULTS, PHASE 2 SEDIMENT INVESTIGATION
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Dieldrin	UG/KG	360	U	380	U	160		180	50000		
4,4'-DDE	UG/KG	360	U	2100		64	J	9000	50000		
Endrin	UG/KG	360	U	380	U	100	U	310000	50000		
Endosulfan II	UG/KG	360	U	380	U	100	U	6200000			
4,4'-DDD	UG/KG	1900		3200		150		12000	50000		
Endosulfan sulfate	UG/KG	410		380	U	15	J				
4,4'-DDT	UG/KG	360	U	140	J	41	J	9000	500000		
Methoxychlor	UG/KG	1800	U	1900	U	520	U	5200000	50000		
Endrin ketone	UG/KG	360	U	380	U	100	U				
Endrin Aldehyde	UG/KG	93	J	380	U	100	U				
alpha-Chlordane	UG/KG	170	J	62	J	27	J				
gamma-Chlordane	UG/KG	310		190	U	52	U				
Toxaphene	UG/KG	7200	U	7600	U	2100	U	200	50000		
Aroclor-1016	UG/KG	3600	U	3800	U	1000	U				
Aroclor-1221	UG/KG	3600	U	3800	U	1000	U				
Aroclor-1232	UG/KG	3600	U	3800	U	1000	U				
Aroclor-1242	UG/KG	3600	U	3800	U	1000	U				
Aroclor-1248	UG/KG	3600	U	3800	U	1000	U				
Aroclor-1254	UG/KG	3600	U	3800	U	1000	U				
Aroclor-1260	UG/KG	3600	U	3800	U	1000	U				
METALS								0			
Aluminum	MG/KG	13700		19100		28600		0			
Antimony	MG/KG	2.7	B	3.6	B	8.2	B	340			
Arsenic	MG/KG	170		131		282		20		8.2	70
Barium	MG/KG	412		237		150		47000			
Beryllium	MG/KG	1	B	1.3	B	2		1			
Cadmium	MG/KG	10.8		8.2		3.7		100		1.2	9.6
Calcium	MG/KG	6220		5660		3560		0			

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PARAMETERS	UNITS							
Chromium	MG/KG	420	358	318	0		81	370
Cobalt	MG/KG	16.8	12 B	12.5 B	0			
Copper	MG/KG	1190	628	420	600		34	270
Magnesium	MG/KG	6730	8250	7660	0			
Manganese	MG/KG	274	324	288	0			
Nickel	MG/KG	110	52.1	46.7	2400		20.9	51.6
Potassium	MG/KG	3670	4900	4670	0			
Selenium	MG/KG	3.4	4.1	11.9	3100			
Silver	MG/KG	8	7.8	4.6	4100		1	3.7
Sodium	MG/KG	11000	11400	11100	0			
Thallium	MG/KG	1 B	1.4 B	2.6 B	2			
Vanadium	MG/KG	140	64.3	90.2	7100			
Zinc	MG/KG	926	681	601	1500		150	410
Mercury	MG/KG	7.4	9.8	7	270		0.15	0.71
Iron	MG/KG	45600	38500	41100	0			
Lead	MG/KG	3780	1670	3020	600		46.7	218

NOTES: U - Indicates that the compound was analyzed for but not detected.

J - This qualifier indicates an estimated concentration. This qualifier is used (1) when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL or PQL but greater than zero, and (3) when the retention time data indicate the presence of a compound that meets the Pesticide/Aroclor identification criteria, and the result is less than the CRQL or PQL but greater than zero.

B - This qualifier is used when the analyte is found in a method blank as well as the sample. It indicates possible sample contamination and warns the user to use caution when applying the results of this analyte.

E - Exceeds calibration range.

N - Indicates presumptive evidence of a compound. This qualifier is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all tentatively identified compound results. For generic classification of a tentatively identified compound, such as chlorinated hydrocarbon, the N code is not used.

02-8403-42A-SI

SITE INSPECTION REPORT
AND HAZARDOUS RANKING SYSTEM MODEL
BAYONNE INDUSTRIES
BAYONNE, NEW JERSEY

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO.
CONTRACT NO. 68-01-6699
02-8403-42A

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

JULY 1, 1985

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY

NICHOLAS W. CAPUANO

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RONALD M. NAMAN
REGIONAL PROJECT MANAGER

CCA000049

EXECUTIVE SUMMARY

BAYONNE INDUSTRIES, INC. has been confronted with an oil slick and/or sheen problem emanating from the separator pond. Although a WEMCO oil separator has been installed to meet the discharge criteria, the existence of large quantities of oily water and oil sludge in the pond is the primary cause of said problem. Bayonne Industries, Inc. retained Roy F. Weston, Inc. to develop a strategy to address and evaluate solutions to this problem.

Based on Weston's field investigations, hydrogeologic studies and bench scale testings, it was determined that the most attractive alternative is closure of the pond by pumping the oily water to the WEMCO separator and encapsulating the remaining sludge in-situ. The recommended strategy for pond closure is detailed in Section 6 of this report. This is feasible technically and environmentally, based on the following findings:

- The approach of in-situ fixation is supported by the following site conditions:

  - A clay layer is located along the bottom of the separator pond. Subsurface borings and laboratory analyses have indicated that there is no migration of contaminants from the pond into the clay layer.

  - The ground water elevation around the outside perimeter of the pond bulkhead is significantly higher than the water elevation in the pond. This indicates that the bulkhead acts as an effective ground water barrier.

  - Laboratory analyses of sludge samples indicate that bio-degradation of organics in the pond is transpiring.

  - Contaminant migration through the pond dike should be restricted by a synthetic membrane and mud fence which are shown in the design drawings for the dike.

- The disposal of sludge in a secure off-site or on-site facility is not considered practical or economically viable.

- Combustion of the sludge in the existing plant boilers is not feasible due to the high ash content of the sludge.

- The pond can be "dewatered" by pumping the oily water to the WEMCO separator.

- The existing discharge lines to the pond can be rerouted for discharge to the Platty Kill or Kill Van Kull.

- Mechanical dewatering of the sludge is not feasible due to the high solids content of the sludge.

- Chemical dewatering of the sludge is not feasible due to limited availability of proper chemicals, sludge mixing problems, and high costs.

- Dewatering of the sludge using flyash is viable if flyash is available nearby at minimal costs.

- Backfill with soil and inert building debris can be used to encapsulate the pond sludge in-situ.

- Sloppy sludge that is encountered during backfilling can be handled by pumping or by natural air drying or mixing with flyash to facilitate spreading in layers.

Based on these findings, it is recommended that the pond closure strategy detailed in Section 6 of this report be implemented. Closure of the pond will encapsulate the sludge which is a primary cause of the oil problems. The primary steps in the closure program are as follows:

- Reroute present discharge lines.

- Plug existing separator pond effluent lines

- Pump oily water to the WEMCO separator

- Backfill with construction/demolition rubble and soil and compact.

- Stabilize any sloppy sludge with flyash or air drying. Integrate dry sludge with soil backfill operations.

- Install a clay layer over the completed pond.

- Install a monitoring well at the dike.

SECTION 1

INTRODUCTION

1.1 General Background

The Bayonne Industries, Inc., in Bayonne, New Jersey encompasses some 180 acres on what was the original site of the Tide Water Refinery and is responsible for the storage and transshipment of Nos. 2, 4 and 6 fuel oil. In addition, tenants on the property handle and store various chemicals and some tallow. Commodities enter and leave this terminal by ship, barge, tank truck and tank car. The products are generally stored in large tanks, most of which are located in groups and the areas are surrounded by earthen dikes or concrete walls. A general location map of Bayonne Industries, Inc. properties is shown in Figure 1-1.

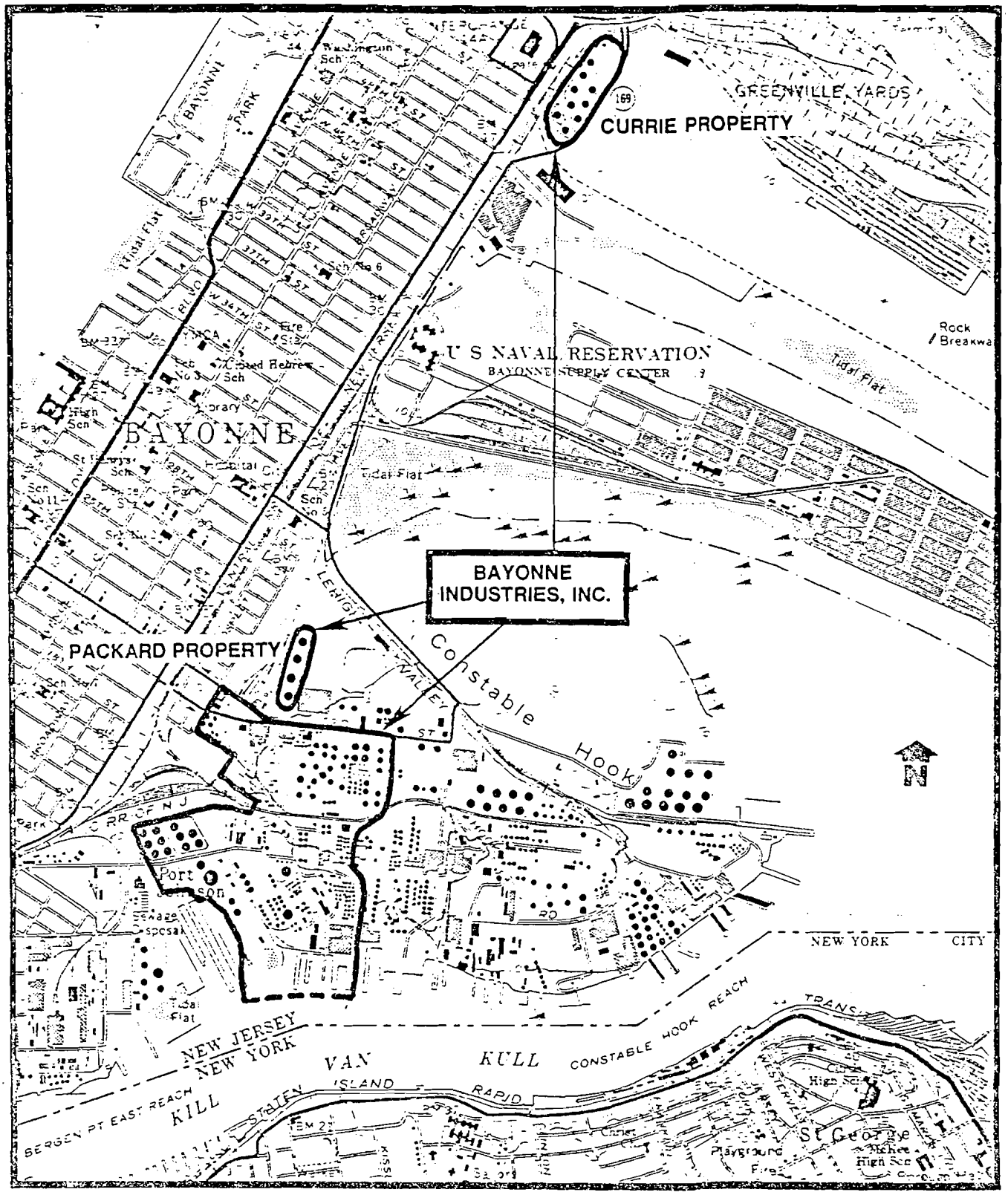
The terminal is serviced by a combined storm and process sewer system. The collected wastewater was being discharged to the separator pond at the head of the Platty Kill. Figure 1-2 is a plot plan showing the locations of the separator pond and the dike in the Platty Kill. In addition to the dike across the Platty Kill, a floating boom in the separator pond is also used to contain and collect oil that is being discharged to the pond through the sewer system. Oil and other floating substances in the pond are being skimmed off continuously. The drain pipes, through the dike located at a lower elevation than the mean low water, discharges water from the pond to the Platty Kill. The process of discharging all waste water to the pond resulted in a buildup of sludge and oily waste in the separator pond at the Bayonne Industries.

A treatment plant has been installed to treat the stormwater and wastewater from Bayonne Industries own operations. This plant started operation on 1 May 1978 and now all wastewater from Bayonne Industries passes through the oil separator before being discharged to the separator pond and eventually into the Platty Kill. However, there are four tenants in the yard discharging their effluents to the separator pond through three separate discharge lines.

1.2 Purpose and Scope

In light of the current contamination problems attributable to the oily sludge in the separator pond, and future stringent pollution regulations, Bayonne Industries, Inc. retained the firm of Roy F. Weston, Inc. (Weston) to provide hydrogeologic engineering and laboratory services required for an assessment of the best method to address the handling

BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY
LOCATION MAP
FIGURE 1.1



SCALE 1 24000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

DATUM IS MEAN SEA LEVEL

WESTON

of sludge and oily waste buildup in the separator pond at the Bayonne Industries. The principal objectives of the investigation conducted by Weston were as follows:

- Define the characteristics of the sludge and oily wastes in the pond.
- Determine the thickness of the sludge and oily wastes in the pond.
- Define the nature and distribution of the natural subsurface deposits.
- Assess the feasibility of control alternatives such as:
  a. In-place burial
  b. Excavation and off-site disposal
  c. Excavation and on-site disposal management
  d. In-place fixation
  e. Combination of two or more of the above methods.
- Recommend technically sound and cost-effective alternative for implementation.

SECTION 2

HYDROGEOLOGIC SETTING AND ANALYSIS

2.1 Subsurface Investigations

As a part of the investigation of the control alternatives of the separator pond, a test boring program was undertaken in the pond and in the dike separating the pond from the Platty Kill. The main objectives of this test boring program were:

1. Collect data on the following:
   - Depth of oily water
   - Thickness and nature of the sludge
   - Nature of the subsurface material underlying the sludge
   - Extent of oil or contaminant migration
2. Collect samples of the sludge from different depths and parts of the pond for waste characterization.

The test borings were done from a floating platform in the pond. Borings in the dike were made with a regular hollow-stem auger. A total of seven (7) borings were made, of which five were in the pond and two were in the dike. The approximate locations of these borings are given in Figure 1-2.

Samples of the sludge were collected from different depths in each of the borings in the pond to study the characteristics of the sludge from different depths and from different parts of the pond. Casings were driven through the sludge to different depths and washed out the sludge to the desired depths. Following this, split-spoon was driven to predetermined depths to collect samples from that depth. This process prevented any mixing of the sludge from different zones. Samples thus collected were kept in an ice chest and transported to the laboratory on the same day for proper storage and analysis. Two borings were made in the dike to determine the nature of material in the dike. PVC casings with screens (1-1/2" I.D.) were installed in the borings made in the dike to monitor water and/or oil levels. Boring logs are given in Appendix A.

2.2 Hydrogeology

It can be seen from the cross-sections of the separator pond (Figures 2-1 and 2-2) that the oily sludge in the pond overlies natural red silty clay. The thickness of this clay bed is over seven feet. This clay layer did not show any evidence of oil contamination and it acts as a natural liner for the pond. The thickness of the sludge varied from 11 to 15 feet. The upper three to four feet of the sludge is very light and the sludge becomes more dense with depth.

The design drawing of the dike, Figure 2-3 (Bayonne Industries' Drawing No. A-14-926) indicates that the dike is made up of sand and quarry stone. The drawing also shows a 1/16" nylon reinforced neoprene membrane, suspended by a cable, installed in the dike as an anti-pollution barrier which extends about five feet below the top of a mud fence. The two test borings, SPD-1 and SPD-2, made in dike showed sand to a depth of 27 feet and 25.50 feet respectively. This sand is underlain by red silty clay. This clay layer did not show any evidence of oil contamination. The sand from boring SPD-1 did not show any trace of oil to a depth of 18 feet. Sand below 18 feet had traces of oil, while sand from SPD-2 was oil stained or saturated from a depth of seven feet. The latest monitoring showed an oil thickness of 0.25 foot in well SPD-2 and no oil in SPD-1. This presence and absence of oil in the monitoring wells may be due to the relative locations of the test wells with reference to the location of the synthetic membrane in the dike. Monitoring well SPD-1 may be in the Platty Kill side of the membrane and SPD-2 in the pond side.

It can be seen from Figure 2-1 that the ground water level on the north and south sides of the pond is about two to three feet above the water surface in the pond. This indicates a relatively tight bulkhead construction. The cross section given in Figure 2-2 shows water surfaces in the pond and Platty Kill during high and low tides and also ground water levels in the dike at different tides. The Platty Kill shows three to four feet of tidal fluctuation, whereas the fluctuation in the pond varies by only less than two feet indicating barrier action of the dike.

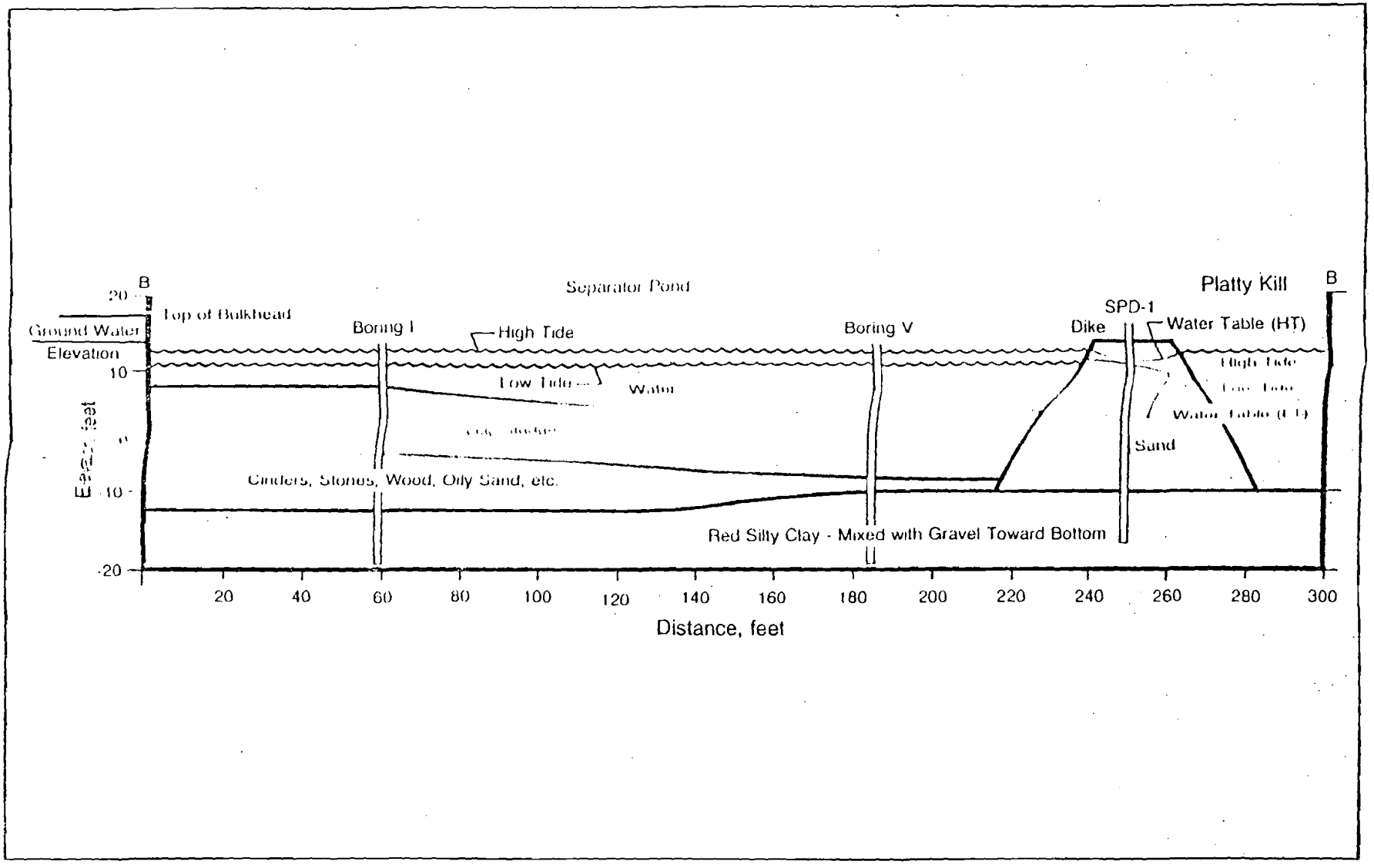


FIGURE 2-2 CROSS SECTION B-B - SHOWING WATER ELEVATIONS IN THE POND AND PLATTY KILL, AND GROUND WATER ELEVATIONS IN THE DIKE AT HIGH AND LOW TIDES

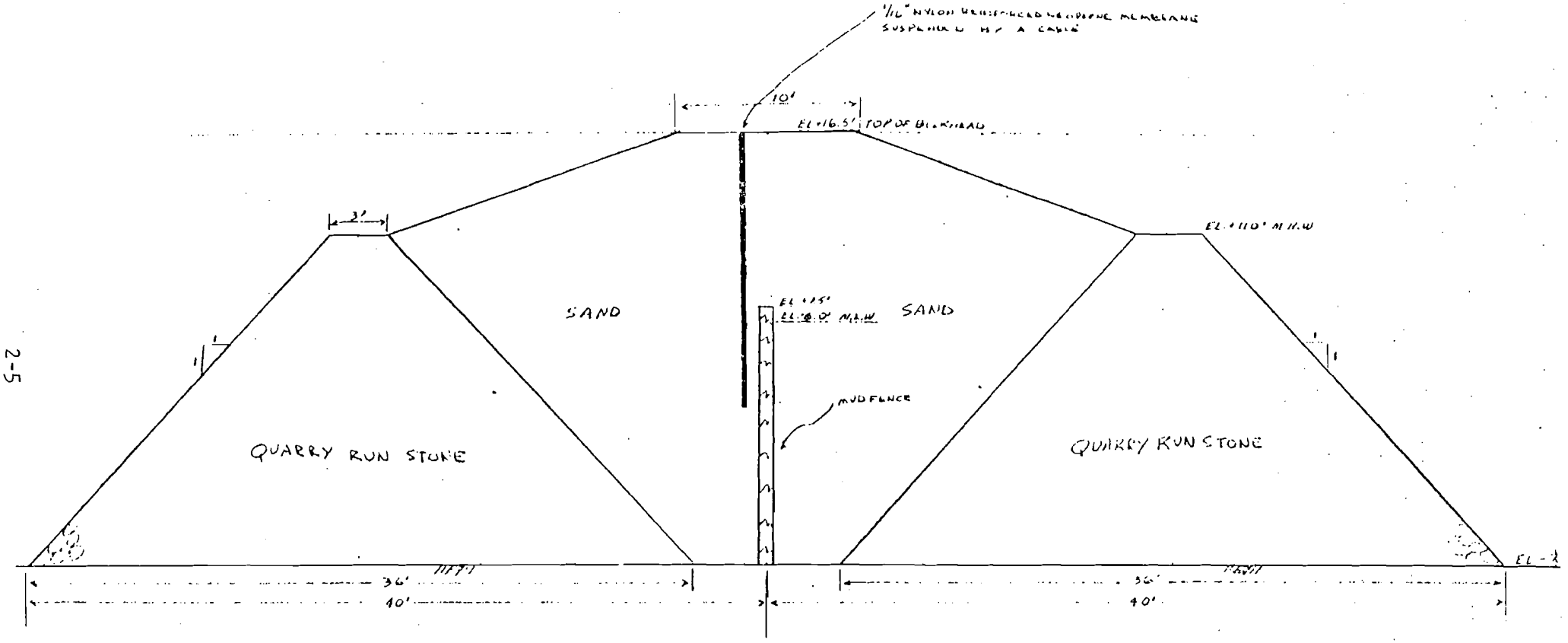


FIGURE 2-3 EXISTING DIKE CONSTRUCTION

NOTE: THIS IS A REDUCED PRINT

BAYONNE INDUSTRIES INC. BAYONNE, N. J
CROSS-SECTIONAL VIEW OF ANTI-POLLUTION BARRIER IN THE PLATTY KILL CREEK
DRN BY W.P. 6-19-71 SCALE 1/4"=1'0"
DWG. NO. A-14-926

SECTION 3

CHEMICAL ANALYSIS OF SLUDGE

Laboratory analyses of sludge and soil samples taken at various depths at the boring locations in the pond were performed and the results are summarized in Table 3-1. The basic findings from these analyses are as follows:

- Contaminants have not penetrated the clay pond bottom.
- The relatively high iron content, 96.4 mg/kg, found in the clay sample is apparently naturally occurring. This is confirmed from the analysis of a soil sample randomly collected in the plant area which reflected a high iron content.
- The solids content of sludge increases with depth, as expected, due to settling. The value ranges from 44% to 63% solids.
- The levels of lead (Pb) and phenols in the sludge are somewhat elevated, but there is no migration into the clay bottom. Phenol also showed higher concentrations immediately at the WEMCO discharge area and progressively decreases at the far end. Biodegradation of phenol may be transpiring and is, therefore, not anticipated to pose a problem during the pond closure.
- An elevated level of phenol was not found in a sample of the pond water that was analyzed.
- The oil and grease content of the sludge is primarily composed of hydrocarbons.
- Ash content of sludge is extremely high, mostly in the 60% to 80% range.

Table 3-1

Samples Collected 3 July 1979
Bayonne Industries

First Set of Analysis

Sample		COD mg/l	% H_2O	O/G	Hydrc.	Phenol	Fe	Cu	Pb	Cr	Zn	Hg	As	Cd	CN	BTU/lb	Ni
I-1	(5 - 8')	584,800	61	23.7*	24.5	7.3	1.0	2.8	1.9	0.20	0.90	0.03	0.34	<0.00	I	9,396	0.80
I-2	(12 - 16')	560,000	37	18.4*	19.5	12.4	99.7	1.01	2.0	0.06	0.53	0.17	1.6	<0.00	I	4,850	0.17
III-1	(8.5 - 11')	186,700	56	9.6	7.9	1.3	56.6	1.1	2.2	0.16	0.73	0.16	1.5	<0.00	I	4,177	0.16
III-2	(15.5 - 19.5')	73,800	48	9.4	8.8	2.1	64.4	0.97	4.9	0.33	1.5	0.25	1.3	<0.00	I	3,765	0.25
IV-4	(25 - 27' - Clay)	17,200	20	--	--	0.7	96.4	0.02	0.09	0.08	0.07	0.03	0.03	<0.00	<30.0	N/A	0.03

Key

I - Interference
* - Total content can be considered hydrocarbon
All metals and phenol reported on a dry weight basis, units are expressed in mg/kg

Samples Collected 30 August 1979

Second Set of Analyses

Sample		% H_2O	% Ash	Phenol	Hg	Cl	BTU/lb
I-2	(8 - 10')	46.05	61.03	14.7	1.1	11,066	7,622
I-3	(10 - 12')	40.40	65.02	59.6	0.94	10,349	6,865
II-2	(10 - 12')	43.16	60.77	14.9	0.81	8,420	6,268
IV-1	(9.75 - 11')	18.66	19.82	19.5	0.98	11,113	8,129
IV-2	(20 - 22.75')	48.43	79.32	3.8	5.89	11,170	3,505
Pond Water		--	--	0.07	--	--	--

SECTION 4

EVALUATION OF ENGINEERING ALTERNATIVES

Based on the results of the test borings and laboratory analyses of the samples, several technologically viable alternatives for pond closure were identified and engineering analyses were performed to prescreen, identify, and select the methodologies that are expected to be practically and economically viable.

The alternatives of off-site sludge disposal and on-site disposal at a controlled location other than the separator pond were reviewed. Due to the elevated levels of phenol and lead in the sludge, off-site disposal should be in a secure landfill due to potential liability considerations. The two nearest secure landfills are located at Niagara Falls, New York and Cincinnati, Ohio, and the estimated transportation and disposal cost is prohibitive. Problems are also anticipated with the permitting, handling, and interstate transportation of this sludge.

On-site disposal in a suitably prepared area would require the construction of a liner system for leachate control. The shallow water table at the plant is not favorable for the construction of a secure landfill on-site, which would require admixture of the sludge with soil to facilitate filling.

Disposal of the sludge in an alternate facility would require extensive excavation work. This excavation and sludge handling may result in the release of contaminants now bound in the sludge.

Borings in the separator pond indicated a clay layer along the bottom of the pond. Laboratory tests indicated that contaminants have not migrated into the clay and therefore the clay is acting as an effective seal along the pit bottom. Measurements have indicated that the ground water elevation around the outside perimeter of the pond bulkhead is significantly higher than the water elevation in the pond. This indicates that the bulkhead is acting as an effective ground water barrier. Laboratory tests of the sludge also indicated that the phenols are being stabilized, probably due to biodegradation. Based on these findings, the approach of in-situ stabilization was selected as an environmentally controlled and effective means for closure of the pond. These alternatives for in-situ controlled closure are briefly described in the following sections.

Test Boring IV

6/28/79

Depth (feet)	Description
0.00 - 7.50	Water
7.50 - 8.75	Very soft oily sludge
8.75 - 10.00	Very soft oily sludge (Sample 4-1)
10.00 - 19.00	Comparatively light oily sludge
19.00 - 21.75	Oily sludge (Sample 4-2)
21.75 - 24.00	Red silty clay - clean (Sample 4-3)
24.00 - 26.00	Red silty clay - clean (Sample 4-4)
26.00 - 27.75	Red silty clay - clean (Sample 4-5)
27.75 - 33.00	Red silty clay mixed with coarse gravel - harder towards bottom (Sample 4-6 - 30.5 - 31 feet Sample 4-7 - 31.0 - 33 feet Sample 4-8 - 33.0 - 34 feet)

Test Boring V

6/29/79

0.00 - 9.00	Water
9.00 - 11.00	Oily sludge - soft and loose (Sample 5-1)
11.00 - 16.00	Oily sludge
16.00 - 18.00	Oily sludge (Sample 5-2)
18.00 - 20.50	Oily sludge (Sample 5-3)
20.50 - 21.75	Oily sand
21.75 - 23.00	Red silty clay (Sample 5-4)
23.00 - 27.00	Red silty clay
27.00 - 29.00	Red silty clay (Sample 5-5)
29.00 - 31.00	Red silty clay with gravel (Sample 5-6)

4.2 Oil Separation

There is an oily water layer approximately 8 to 10 feet deep in the pond, equivalent to about 2,000,000 gallons. The existence of a WEMCO oil separator makes on-site treatment highly feasible by pumping the oily water layer through the WEMCO at a controlled rate. Pump(s) can be set up as shown in Figure 4-1 to transfer the oily water from the pond to the WEMCO. A temporary baffle should be provided around the suction end of the pump to minimize heavy sludge carry over and maximize removal of pumpable liquids which may include some water-sludge interface. Separated oil will be fired as fuel in one of the existing boilers. The pumping rate shall be matched with the separator capacity to maintain compliance with the effluent criteria at all times. This set-up may be used for the entire duration of the closure operation or until the point of practical limitation is reached.

4.3 Sludge Disposal by Combustion in Existing Boilers

An alternative for handling the "pumpable" or "flowable" portion of the sludge is through combustion in the existing Bayonne Industries boilers. The "pumpable" sludge is that sludge with a higher moisture content located at the interface with the oily water. The quantity of this sludge is approximately 1,000,000 gallons.

Bayonne Industries has four 1947 B&W water tube boilers, each rated at 1000 HP and are presently fired with No. 6 fuel oil. The steam generation rate is 100,000 lbs. per hour at 250 psig and 490°F. During the summer months usually one boiler is operating and in winter at least three and occasionally all four boilers are operating.

Each boiler is designed strictly for fuel oil firing. The furnace is not equipped with a grate system nor a hopper for ash removal. Ash is removed manually and intermittently from the flat refractory lined furnace floor whenever the boiler is "cold".

There are four steam atomized oil burners per boiler arranged symetrically with two on the top row and two on the bottom row. The atomizer assembly is removable from the steam-fuel tube (2" Ø standard pipe) where the impeller on the fireside is attached.

There is no thermocouple in the furnace to obtain furnace temperature readings, but it is approximated that the furnace temperature is in the 2000°F range.

Based on Weston's field observation, it seems feasible to employ one of the steam-fuel tubes as a casing for a smaller sludge injection system. However, laboratory results of the sludge characterization analyses showed very high ash content of over 50%. Although the sludge

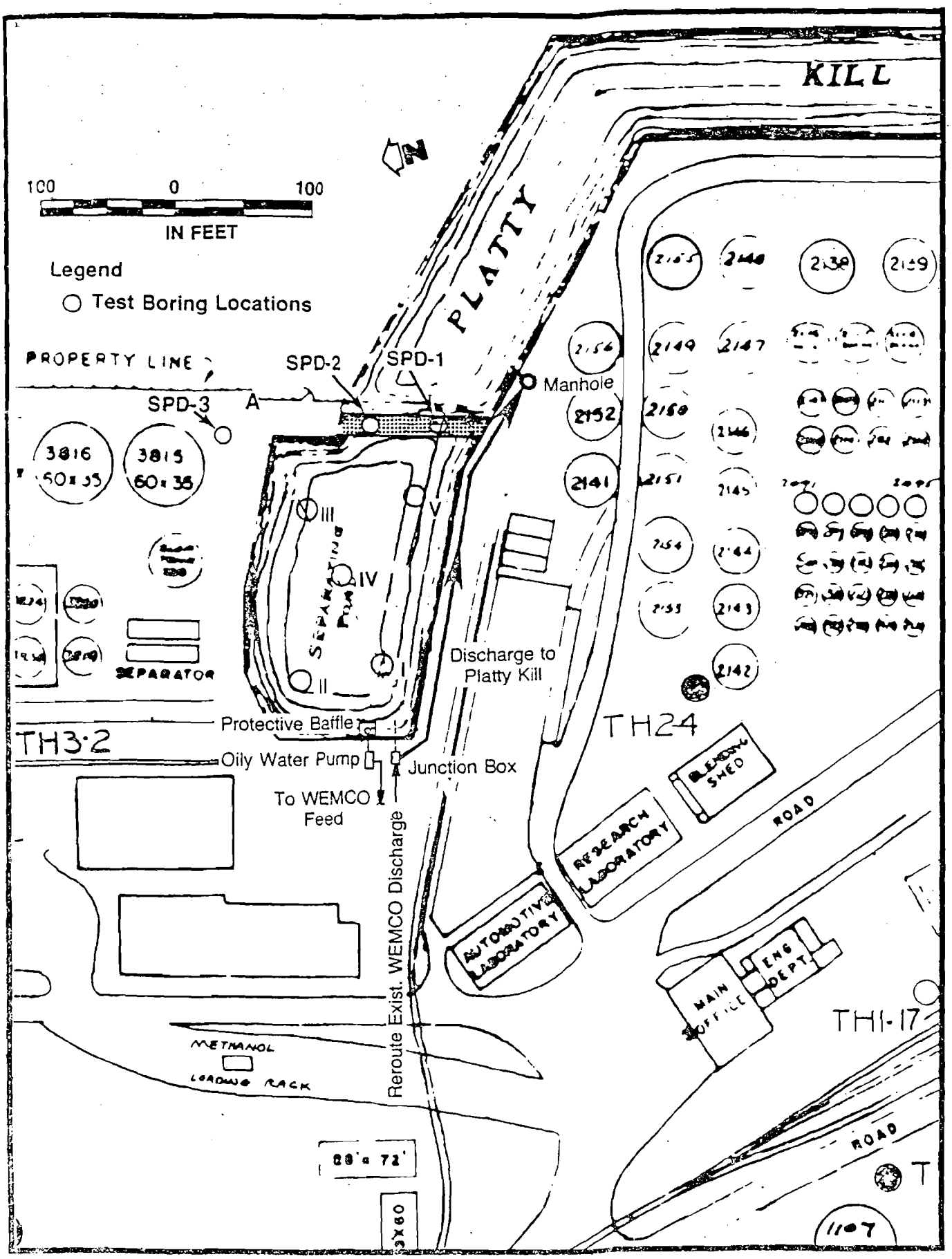


FIGURE 4-1 SCHEMATIC PLAN—REROUTING OF WEMCO DISCHARGE AND OILY WATER PUMPING SYSTEM

heating values of 6000 to 8000 Btu/lb are high and have a positive heat input to the system, the boilers are not designed and properly equipped to burn fuel having such high levels of ash. Non-compliance of the air quality criteria for particulate emissions because of the lack of flue gas cleaning equipment and slagging problems of the tubes due to prolonged burning at elevated temperatures are antitipated; therefore, this alternative is not recommended.

4.4 Sludge Dewatering Prior to Direct Burial On-Site

Alternatives for sludge dewatering were evaluated as a means for improving the sludge handling characteristics during pond closure.

4.4.1 Sludge Dewatering by Mechanical Means

Cursory investigations for dewatering sludge employing centrifuges were made. Sludge would be excavated from the pond, fed through the centrifuge, dewatered and redeposited in the pond. Centrate would be fed to the WEMCO. Based upon the reported solids content in excess of 50%, further efforts of increasing the solids content by mechanical means is not practically feasible and is ruled out.

4.5 Sludge Dewatering Using Dry Flyash

Dry flyash has favorable moisture absorbing characteristics and is a material that may be obtained from the power industry at minimal cost.

4.5.1 Bench Scale Tests

An experiment using flyash as the dewatering agent was performed on a scaled model of the separator pond. Similar tests were performed for the other succeeding dewatering processes. The setup is described in detail in this section.

Using an aquarium tank as the separator pond, the pond profile was simulated. Higher density sludge was set at the bottom of the tank and the sludge with higher moisture content on the top layer for a total sludge depth representing 12 feet. A sludge water interface representing two to three feet was set up next and then oily water was added to simulate a total pond depth of 20 feet. The pond was allowed to settle before proceeding to the next step. At one corner of the "pond" a positive displacement pump was used to pump out all the oily water prior to any backfilling or chemical addition.

The supernatant liquid was carefully pumped to minimize disturbance of the black oily layer(s).

The results of the tests are interpreted as follows:

- Lime absorbed some moisture but the sludge-lime mix is relatively soft compared to the area using flyash mixture.
- The reaction is exothermic; however, adding lime directly did not result in any noticeably "violent" reaction.
- An equivalent of approximately 400 tons of lime would be needed.

This alternative is ruled out because of its marginal effectiveness and the extra expenditure for raw material and handling. The use of lime was not as effective as flyash.

4.6.2.2 Sludge Stabilization Using Gypsum

Gypsum ($CaSO4.2H_2O$) or hydrated calcium sulfate has some absorbing values but not as good as the calcined $CaSO4$. However, gypsum is readily available in commercial quantities.

The test for gypsum was performed using the same procedure described in Section 4.6.2.1 Sludge Stabilization Using Lime.

The results are as follows:

- The resultant mix was soft and setting time was very poor. It will probably take three times as long to dry as the lime mix. On the third week of the experiment, gradual stiffening was observed. This may be attributed more towards natural evaporation process than a chemical action.

This alternative is ruled out because of the very poor bench test results to effectively stabilize the pond. $CaSO_4.2H_2O$ will not work as a stabilizer or a dewatering agent for Bayonne Industries' sludge.

4.6.2.3 Sludge Stabilization Using Plaster of Paris

$CaSO_4.1/2H_2O$, commonly known as plaster of Paris, has excellent moisture absorbing capabilities.

The test was performed using the same procedure described in Section 4.6.2.1 Sludge Stabilization Using Lime.

The results are as follows:

- The resultant mix set up and was firm in 5 days under laboratory conditions.
- An equivalent of approximately 380 tons of $CaSO4.1/2H_2O$ would be needed. This material is not readily available in commercial quantities.

Although the experiment had good success, this option is ruled out because of the difficulty in obtaining this material in commercial quantities and the extra expenditure for raw material and handling.

4.7 Backfill with Soil

Weston had investigated the cost of obtaining backfill soil. Quotes obtained from local contractors indicate a high price for soil delivered to the site. The possible use and availability of soil on-site was investigated along with non-biodegradable demolition/construction rubble, i.e., concrete, brick and the like. This use of inplant demolition/construction debris as fill material will eliminate associated costs for removal and hauling.

Bench tests were run using soil only in one case, and rubble and soil backfill in the other. The set-up was prepared as described in Section 4.5.1. Dirt used in the tests was obtained from an area at the Bayonne Plant where excess soil could be obtained for backfilling.

The observations are as follows:

- Less dense sludge was displaced as fill dirt volume was increased and compacted. The compacted area was firm and capable of supporting tracked equipment for maneuvering, as the operation progressed towards the other end.
- Approximately 40 to 60% of the total sludge volume was displaced using dirt only.
- When rubble and dirt were used, approximately the same quantity of sludge was displaced. On a small scale the gaps and voids created by bridging of the rubble is relatively small and the interstices occupied by sludge was almost completely replaced by the fill dirt during compacting. However, it is expected that during actual field operations, bulky pieces of rubble will bridge more stably and contain the sludge within the voids. Fill dirt will not significantly replace this sludge.

- A mound of sludge was created as a result of the backfilling operations. The mound area was soft and intermittent turning over of the mound helped speed up the drying of the soft sludge mound.

- Approximately 20,000 cubic yards of soil will be needed.

- Drying time under laboratory conditions took over four weeks.

- Rainfall was simulated over the compacted area and some softening of the encapsulated sludge was observed. However, the fill remained relatively stable to support traffic load.

Based upon the results of all these tests, a pond closure strategy was developed and discussed in detail in the latter section of this report.

SECTION 5

RELOCATION OF DISCHARGE LINES

In conjunction with the pond closure work, all existing discharge lines must be rerouted for direct discharge to the Platty Kill Creek or Kill Van Kull. A preliminary review of grades and elevations indicates that this is possible. This rerouting can be directly from the source or through a junction box/lift station.

All this work must be done prior to the pond closure.

5.1 Tenants

Based upon preliminary field information, the tenants discharge lines may be rerouted as follows: (Additional engineering evaluations will be needed to finalize the rerouting plan.)

5.1.1 White Chemical Company and Southern California Chemical Company

The line from Southern California Chemical Company is reportedly the discharge from a flow batch operation of approximately 50 gpm maximum. This combines with the White's cooling water discharge of approximately 200,000 gal/day. The combined discharge manhole is at invert El. 9.19'±. A lift station may be used to reroute this discharge to the Platty Kill or Kill Van Kull.

5.1.2 Rona

A 30-inch line at invert El. 8'± at the pond handles Rona's discharge of 100 gpm. A lift station may be installed to intercept the discharge and the force main can be routed directly to the Platty Kill.

5.1.3 Metropolitan Rendering

The discharge from this plant may be rerouted by gravity because of its proximity to the pond and a higher starting elevation of approximately El. 19'.

(QUAD) JERSEY CITY, N.J.

FIGURE A-1

SITE LOCATION MAP

BAYONNE INDUSTRIES, BAYONNE, N.J.

SCALE: 1" = 2000'

NUS CORPORATION

A Halliburton Company

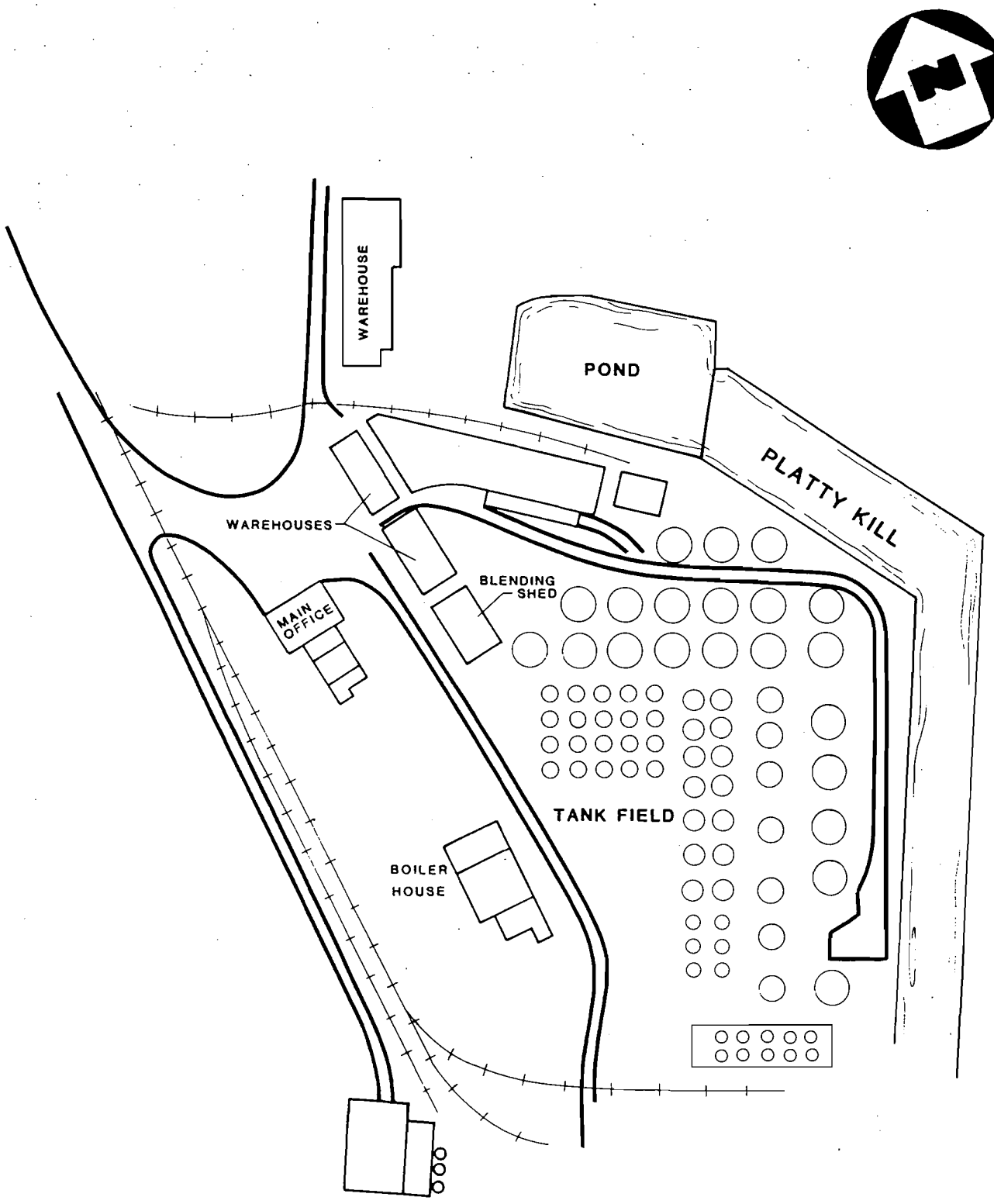


FIGURE A-2

SITE MAP

BAYONNE INDUSTRIES, BAYONNE, N.J.

SCALE: 1"= 150'

NUS CORPORATION

A Halliburton Company

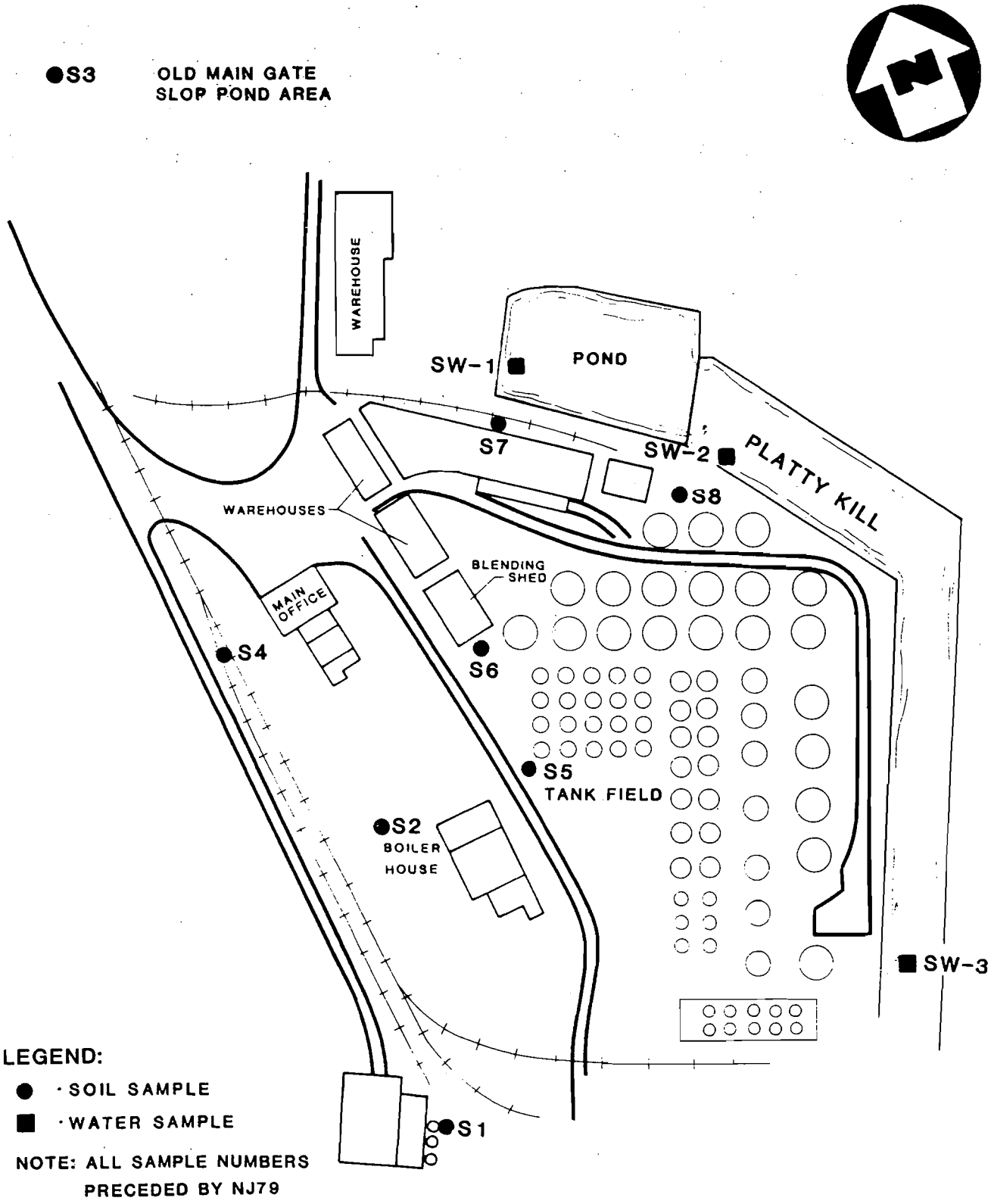


FIGURE A-3

SAMPLE LOCATION MAP

BAYONNE INDUSTRIES, BAYONNE, N.J.

SCALE: 1"= 150'

NUS CORPORATION

A Halliburton Company

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NJ	D064288855

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Bayonne Industries, Inc.	Foot of East 22nd Street				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Bayonne	NJ	07002	Hudson	017	14
09 COORDINATES LATITUDE: 40° 39' 14.N	LONGITUDE: 074° 06' 40.W				

10 DIRECTIONS TO SITE (Starting from nearest public road)

Take exit 14A from the NJ Turnpike south to 22nd Street. Turn left on 22nd Street. Make a right from 22nd Street to Bayonne Industries, Inc.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)			
Raymond Schwedfeger	Foot of East 22nd Street			
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 TELEPHONE NUMBER**	
Bayonne	NJ	07002	(201) 437-2200	
07 OPERATOR (If known and different from owner)	**08 STREET** (Business, mailing, residential)			
Raymond Schwedfeger	Foot of East 22nd Street			
09 CITY	**10 STATE**	**11 ZIP CODE**	**12 TELEPHONE NUMBER**	
Bayonne	NJ	07002	(201) 437-2200	

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☒ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: 06/09/81 (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☒ YES DATE 05/27/83 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: NJDEP (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)	03 YEARS OF OPERATION		
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN	1955 (BEGINNING YEAR)	1983 (ENDING YEAR)	☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Oily sludge containing organic chemicals and heavy metals.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

An oil slick and/or sheen emanating from the Platty Kill lagoon caused by the presence of large quantities of oily water and oil sludge in the pond.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
Mark Haulenbeek	US EPA Region II			(201) 321-6685
04 PERSON RESPONSIBLE FOR ASSESSMENT	**05 AGENCY**	**06 ORGANIZATION**	**07 TELEPHONE NUMBER**	**08 DATE**
Gregory K. Scott		NUS Corp. FIT II	(201) 225-6160	5/25/84 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

CCA000050

NUS CORPORATION
A Halliburton Company

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
EXECUTIVE SUMMARY

Bayonne Industries	NJ D064288855
Site Name	EPA Site ID Number
Bayonne, NJ	02-8403-42A
Address	TDD Number

SITE DESCRIPTION

Bayonne Industries stores and transports fuel oils. Bayonne Industries and their tenants discharge wastewater into an unlined and unsound separator pond. This pond is separated from the Platty Kill by a porous earthen bulkhead. A layer of sludge has accumulated on the bottom of the pond. As of 1984, Bayonne Industries was awaiting New Jersey DEP approval for encapsulation of the separator pond.

Prepared by: Nick Capuano
of NUS Corporation

Date: July 1, 1985

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NJ	D064288855

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER (Specify) _____
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS: Unknown
- CUBIC YARDS: Unknown
- NO. OF DRUMS: N/A

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☒ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	Unknown		*Bayonne Industries, Inc. and three
OLW	OILY WASTE			tenant companies discharged effluents
SOL	SOLVENTS			to the separator pond.
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SLU	Methylene Chloride		Lagoon Sludge	8.4	ppm
SLU	Chloroform	67-66-3	Lagoon Sludge	3.4	ppm
SLU	1,2-Dichloroethane		Lagoon Sludge	1.2	ppm
SLU	Benzene	71-43-2	Lagoon Sludge	60	ppm
SLU	Tetrachloroethylene		Lagoon Sludge	5.8	ppm
SLU	Chlorobenzene	108-90-7	Lagoon Sludge	120	ppm
SLU	Bis(2-Ethylhexyl)Phthalate		Lagoon Sludge	9.2	ppm
SLU	Phenanthracene		Lagoon Sludge	19	ppm
SLU	Arsenic	7440-38-2	Lagoon Sludge	42	ppm
SLU	Cadmium	7440-43-9	Lagoon Sludge	1.5	ppm
SLU	Chromium	7440-47-3	Lagoon Sludge	190	ppm
SLU	Copper		Lagoon Sludge	3200	ppm
SLU	Lead		Lagoon Sludge	390	ppm
SLU	Mercury	7439-97-6	Lagoon Sludge	1.3	ppm
SLU	Zinc		Lagoon Sludge	440	ppm
SLU	Selenium		Lagoon Sludge	0.23	ppm

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NJDEP/DWM Files.

NUS CORPORATION

POTENTIAL HAZARDOUS WASTE SITE

PRELIMINARY ASSESSMENT

Bayonne Industries, Inc. Site Name	NJD064288855 EPA Site ID Number
Foot of East 22nd St. Bayonne, NJ 07002 Address	02-8403-42 TDD Number

Date of Site Visit: None Conducted

SITE DESCRIPTION Bayonne Industries blends, stores, and transport fuel oils. Storm and process wastewater is discharged from an oil/water separator to a separator pond at the head of the Platty Kill. A floating boom in the separator pond continuously skims oily waste off the surface. A layer of sludge has accumulated on the bottom of the pond. As of 1983, Bayonne Industries was waiting for NJDEP approval of an encapsulation plan for the separator pond. The sludge was to be left in situ and covered by rubble, soil, and finally capped with clay. The wastewater discharge would then be treated by oil/water separati and air flotation before discharge.

PRIORITY FOR FURTHER ACTION: High ___ Medium X Low ___

Prepared by: G. K. Scott of NUS Corporation Date: May 25, 1984

WESTON WAY
WEST CHESTER, PA. 19380
PHONE: (215) 692-3030
TELEX: 83-5348

24 October 1984

Mr. Thomas Sherman
Bureau of Hazardous Waste Engineering
Department of Environmental Protection
Division of Waste Management
32 North Hanover Street
CN-027
Trenton, NJ 08625

Reference: 1) Bayonne Industries Separator Pond Closure Plan - HWF File No. 10084

2) Letter from Mr. Frank Coolick dated 2 June 1983

3) Letters to Mr. Thomas Sherman from Abraham Thomas dated 15 September 1983 and 20 July 1984

Dear Mr. Sherman:

In my letter of 15 September 1983, referenced as Item 3 above, I have summarized the agreements reached at our meeting of 1 July 1983 on each of the items mentioned in the letter referenced as Item 2 above. As agreed upon, two additional locations were selected in the old Separator Pond for additional sampling of pond water, sludge, cinders and clay. These locations are shown in Figure 1. Samples were collected at Location 1 on 26 April 1984 and at Location 2 on 27 April 1984.

Water samples from the pond were collected from a floating platform at each boring location using a plastic bucket sampler. A new sampler was used at each location to minimize the potential for cross-contamination of the water samples via the sampler. Prior to filling the sample bottles, the sampler was rinsed with sample water. These samples were stored in an ice chest on site and returned to the WESTON lab for analysis.

In addition to the water samples, a total of two test borings in the pond were completed from the floating platform using a split spoon and a bucket sampler. Samples were collected from different depths to assess the characteristics of the sludge and underlying material.

Sludge was collected using a bucket sampler as the split spoon could not hold the sample. A casing was then driven through the sludge to the top of the underlying cinder layer. The sludge was then washed out so that samples of the cinder and underlying clay layer could be sampled without interference from the sludge. This process was used at both locations to obtain representative samples from the oily sludge, the gray-block cinders and the red silty clay.

As with the water samples, the sediment samples were kept refrigerated and then transported to the lab for analysis. Boring logs are given as Attachment A.

The priority pollutant analysis was conducted on the following samples collected from the separator pond:

- Aqueous layer (i.e. the water sample)
- Oil Sludge layer
- Cinder layer
- Red clay layer (i.e. bottom layer of pond).

Initial attempts on analysis of the samples, especially oily sludge samples were met with limited success due to interferences caused by the presence of excessive hydrocarbon fractions. As a results, the recovery values for spiked samples were outside the acceptable range.

Faced with the above situation, it became necessary to modify the dilution procedure so that the interference from the presence of aliphatic hydrocarbons and their decomposition products can be minimized. This technique was found to be successful in obtaining acceptable recovery values also. The details of this technique and its impact on detection limit and the limit of quantification are outlined in the attached memorandum from Dr. James Smith, Director of our laboratories (Attachment B).

The following attachments summarize the analytical data on the various samples collected from the Separator Pond.

Attachment C1-6	Priority Pollutant	Water Samples
Attachment D1-6	Priority Pollutant	Sludge Samples
Attachment E1-6	Priority Pollutant	Cinder Samples

Attachment F1-7	Priority Pollutant	Red Clay Samples
Attachment G1-4	Priority Pollutant	Quality Control Samples
Attachment H	Inorganic analysis Results on Water, Sludge, Cinders and Clay samples and EP Toxicity in Sludges, Waters and Clay Samples	
Attachment I	Reactivity and Corrosivity	Sludge
Attachment J	Reactivity and Corrosivity	Cinders

These results indicate that the major contaminants in the Separator Pond include:

- Aliphatic hydrocarbons and their decomposition products
- Heavy metals
- Volatile organics.

Further analysis of the laboratory data indicates that these contaminants are essentially contained within the aqueous and oil sludge layers. The contaminant levels are reduced through the cinder layer and the bottom of the pond (red clay layer) is essentially free of organics indicating effective containment of pollutants within the Separator Pond. Further, the red clay layer appears to provide an effective seal against migration of contaminants.

Based on these findings, it seems appropriate to proceed with the previously submitted in situ stabilization plan for the pond.

In response to Item 5 of Mr. Coolick's letter, referenced as Item 2 above, a copy of the application submitted to NJDEP to modify the permit to allow burning of recovered oil is also attached (Attachment K) for your review.

We suggest to get together with you upon completion of your review of the data submitted with this letter to discuss the other items of concern expressed in Mr. Coolick's letter of 2 June 1983. Your classification of waste will have

different types of impacts on the other items mentioned. We, therefore, feel that it will be more productive to respond to those concerns after your classification of waste.

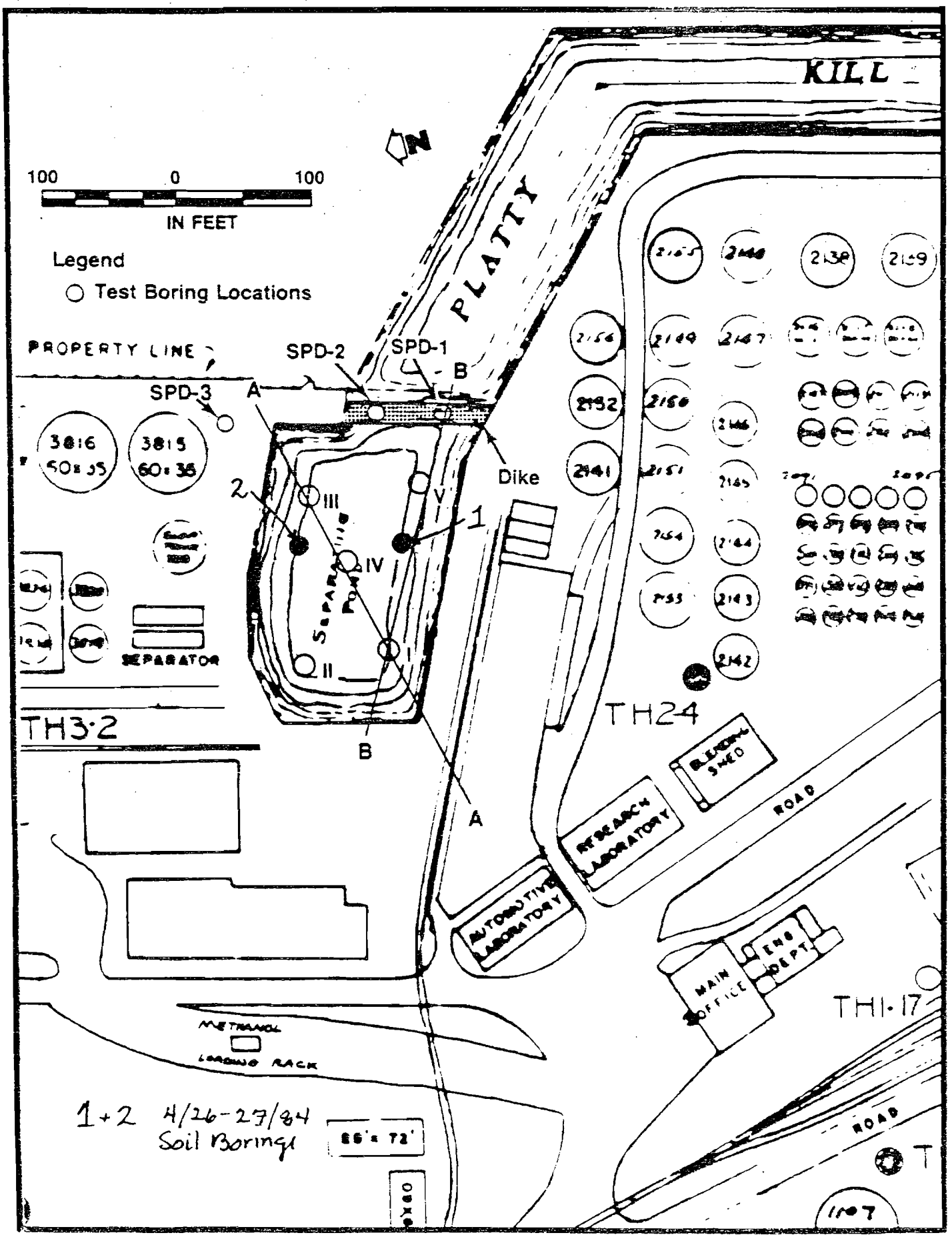
Very truly yours,

ROY F. WESTON, INC.

Abraham Thomas, P.G.
Project Director
Geosciences Department

Attachments

cc: Dave Schrier - H.W. Classification
Raymond Schwedfeger - Bayonne Industries
Stephen Gordon, Esq.



● - New Test Borings

Figure 1: LOCATION OF NEW TEST BORINGS

ATTACHMENT A

BORING #1 LOG

Depth	Description	Sample
0' - 8'	Water	Grab sample
8' - 14'	Oily Sludge	#1 (8'-10') bucket sample
14' - 17.5'	Gray-black cinders	#2 (14'-16') blow count 11/18/27/28
17.5-20'	Silty Clay	#3 (16'-18') blow count 18/12/12/19
		#4 (18'-20') blow count 10/10/11/16

BORING #2 LOG

0' - 6'	Water	Grab sample
6' - 12'	Oily Sludge	#1 (6'-7') bucket sample
12' - 16'	Gray-black cinders	#2 (12'-14') blow count 2/2/2/5
		#3 (14'-16') blow count 2/2/2/9
16' - 18'	Silty Clay	#4 (16'-18') blow count 11/34/29/14

inter-office memorandum

TO: Abe Thomas

DATE: 19 September 1984

FROM: Jim Smith

SUBJECT: BAYONNE INDUSTRIES PRIORITY POLLUTANT RESULTS

W. O. No.:

All five samples contained very large quantities of aliphatic hydrocarbons and their respective "aged" products. In order to analyze these sample extracts, the laboratory had to dilute the extracts. The hydrocarbon interference was minimized via dilution and as a result the detection limit and the limit of quantitation were increased to values considerably above the expected 1 mg/kg level.

Samples spiked with priority pollutants gave percent recoveries with the limits prescribed by EPA's contract laboratory program. The low percent recoveries for the acid fraction is a normal result.

It appears that the only documented priority pollutants in the Bayonne Industries' samples is di-n-butyl phthalate and naphthalene in the composite sludge and di-n-butyl phthalate in the composite cinders. However, the di-n-butyl phthalate can be a laboratory contaminant.

The N-nitrosodiphenylamine shown in the water extract can be diphenylamine. All other compounds are tentatively found at levels between the limit of quantitation and the limit of detection. These compounds should be considered as false positives until verified by further sampling and analysis.

ATTACHMENT C

DATA SUMMARY FOR: Bayonne

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0080 (water)

SAMPLE DESCRIPTION: Composite Location 1 & 2 (Second Run)

GC/MS FRACTION

ACID COMPOUNDS

Units of Concentration ug/L X

mg/L

Other

Detection Limit 1ug/L
Limit of Quantitation 10ug/L

2 Chlorophenol	NF
2,4 Dichlorophenol	NF
2,4 Dimethylphenol	NF
4,6 Dinitro-O-Cresol	NF
2,4 Dinitrophenol	NF
2 Nitrophenol	NF
4 Nitrophenol	NF
P Chloro-M-Cresol	NF
Pentachlorophenol	NF
Phenol	NF
2,4,6 Trichlorophenol	NF
Other	

BAYONNE INDUSTRIES, INC.

WATER SAMPLE

RFW 8405-16E-0080

GC/MS FRACTION

BASE/NEUTRAL COMPOUNDS

(First Run) Units of Concentration µg/L X

mg/L

Other

Acenaphthene	NF	Diethyl Phthalate	NF
Acenaphthylene	NF	Dimethyl Phthalate	NF
Anthracene	NF	Di-N-Butyl Phthalate	NF
Benzidine	NF	2,4 Dinitrotoluene	NF
Benzo(a) Anthracene	1<x<10	2,6 Dinitrotoluene	NF
Benzo(a) Pyrene	NF	Di-N-Octyl Phthalate	NF
3,4 Benzo-fluoranthene	NF	1,2 Diphenyl hydrazine	NF
Benzo(ghi) Perylene	NF	Fluoranthene	NF
Benzo (k) fluoranthene	NF	Fluorene	1<x<10
Bis (2-chloroethoxy) Methane	NF	Hexachlorobenzene	NF
Bis (2-chloroethyl) ether	NF	Hexachlorobutadiene	NF
Bis (2-chloroisopropyl) ether	NF	Hexachlorocyclopentadiene	NF
Bis (2-ethyl hexyl) phthalate	1<x<10	Hexachloroethane	NF
4 Bromophenyl phenyl ether	NF	Indeno (1,2,3-cd) Pyrene	NF
Butyl Benzyl Phthalate	NF	Isophorone	NF
2-Chloronaphthalene	NF	Naphthalene	NF
4-Chlorophenyl phenyl ether	NF	Nitrobenzene	NF
Chrysene	NF	N-Nitrosodimethylamine	NF
Dibenzo(a,h) Anthracene	NF	N-Nitroso di-N-propylamine	NF
1,2 Dichlorobenzene	NF	N-Nitrosodiphenylamine	NF
1,3 Dichlorobenzene	NF	Phenanthrene	NF
1,4 Dichlorobenzene	NF	Pyrene	NF
3,3' Dichlorobenzidine	NF	1,2,4 Trichlorobenzene	NF
		Other	NF

DATA SUMMARY FOR: Bayonne

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0080 (water)

SAMPLE DESCRIPTION: Composite Location 1 & 2 (Duplicate Analysis with Quality Control)

GC/MS FRACTION

BASE/NEUTRAL COMPOUNDS

Units of Concentration ug/L X

mg/L

Other

Limit of Detection 1ug/l
Limit of Quantitation 10ug/l

Acenaphthene		Diethyl Phthalate	
Acenaphthylene		Dimethyl Phthalate	
Anthracene		DI-N-Butyl Phthalate	
Benzidine		2,4 Dinitrotoluene	
Benzo(a) Anthracene		2,6 Dinitrotoluene	
Benzo(a) Pyrene		DI-N-Octyl Phthalate	
3,4 Benzo-fluoranthene		1,2 Diphenyl hydrazine	
Benzo(ghI) Perylene		Fluoranthene	
Benzo (k) fluoranthene		Fluorene	
Bis (2-chloroethoxy) Methane		Hexachlorobenzene	
Bis (2-chloroethyl) ether		Hexachlorobutadiene	
Bis (2-chloroisopropyl) ether		Hexachlorocyclopentadiene	
Bis (2-ethyl hexyl) phthalate		Hexachloroethane	
4 Bromophenyl phenyl ether		Indeno (1,2,3-cd) Pyrene	
Butyl Benzyl Phthalate		Isophorone	
2-Chloronaphthalene		Naphthalene	
4-Chlorophenyl phenyl ether		Nitrobenzene	
Chrysene		N-Nitrosodimethylamine	
Dibenzo(a,h) Anthracene		N-Nitroso di-N-propylamine	
1,2 Dichlorobenzene		N-Nitrosodiphenylamine*	160
1,3 Dichlorobenzene		Phenanthrene	
1,4 Dichlorobenzene		Pyrene	
3,3' Dichlorobenzidine		1,2,4 Trichlorobenzene	
		Other	

BAYONE INDUSTRIES, INC.

WATER SAMPLE LOCATION 1

RFW 8405-166-0080

GC/MS FRACTION

VOLATILE COMPOUNDS

Units of Concentration µg/L
mg/L
Other

Acrolein	NF	Methylene Chloride	1<X<1
Acrylonitrile	NF	1,1,2,2 Tetrachloroethane	30
Benzene	61	Tetrachloroethylene	NF
Bis (chloromethyl) Ether	NF	Toluene	28
Bromoform	NF	1,2 Trans Dichloroethylene	81
Carbon Tetrachloride	NF	1,1,2 Trichloroethane	NF
Chlorobenzene	1<X<10	1,1,1 Trichloroethane	NF
Chlorodibromomethane	NF	Trichloroethylene	15
Chloroethane	NF	Trichlorofluoromethane	NF
2-Chloroethylvinyl Ether	NF	Vinyl Chloride	NF
Chloroform	1<X<10	Other	X
Dichlorobromomethane	NF		
Dichlorodifluoromethane	NF		
1,1 Dichloroethane	NF		
1,2 Dichloroethane	60		
1,1 Dichloroethylene	NF		
1,2 Dichloropropane	NF		
1,2 Dichloropropylene	NF		
Ethylbenzene	1<X<10		
Methyl Bromide	NF		
Methyl Chloride	NF		

BAYONE INDUSTRIES, INC.

WATER SAMPLE LOCATION 2

GC/MS FRACTION

VOLATILE COMPOUNDS

Units of Concentration µg/L X
mg/L
Other

Acrolein	NF	Methylene Chloride	1<X<10
Acrylonitrile	NF	1,1,2,2 Tetrachloroethane	19
Benzene	1<X<10	Tetrachloroethylene	NF
Bis (chloromethyl) Ether	NF	Toluene	1<X<10
Bromoform	NF	1,2 Trans Dichloroethylene	50
Carbon Tetrachloride	NF	1,1,2 Trichloroethane	NF
Chlorobenzene	1<X<10	1,1,1 Trichloroethane	NF
Chlorodibromomethane	NF	Trichloroethylene	22
Chloroethane	NF	Trichlorofluoromethane	NF
2-Chloroethylvinyl Ether	NF	Vinyl Chloride	NF
Chloroform	1<X<10	Other	X
Dichlorobromomethane	NF		
Dichlorodifluoromethane	NF		
1,1 Dichloroethane	NF		
1,2 Dichloroethane	29		
1,1 Dichloroethylene	NF		
1,2 Dichloropropane	NF		
1,2 Dichloropropylene	NF		
Ethylbenzene	NF		
Methyl Bromide	NF		
Methyl Chloride	NF		

BAYONNE INDUSTRIES, INC.

WATER SAMPLE

RFW 8405-166-0080

GC/MS FRACTION
PESTICIDES

Units of Concentration ug/L X
mg/L
Other

Aldrin	<0.2	PCB 1232	<1.0
a-BHC	<0.1	PCB 1248	<1.0
B-BHC	<0.1	PCB 1260	<2.0
Y-BHC	<0.3	PCB 1016	<1.0
δ-BHC	<0.1	Toxaphene	<5.0
Chlordane	<1.0	Other	
4,4' DDT	<1.0		
4,4' DDE	<0.2		
4,4' DDD	<1.0		
Dieldrin	<0.2		
α-Endosulfan	<0.1		
B-Endosulfan	<0.2		
Endosulfan	<0.1		
Endrin	<0.4		
Endrin Aldehyde	<0.1		
Heptachlor	<0.2		
Heptachlor Epoxide	<0.2		
PCB-1242	<1.0		
PCB-1254	<2.0		
PCB-1221	<1.0		

ATTACHMENT D

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0120 (1:100 dilution)

SAMPLE DESCRIPTION: Composite Sludge
(Second Run)

GC/MS FRACTION

ACID COMPOUNDS

Units of Concentration ug/L ___
mg/L ___
Other mg/

Detection Limit = 100 mg/kg

Limit of Quantitation = 250 mg

2 Chlorophenol	NF
2,4 Dichlorophenol	NF
2,4 Dimethylphenol	NF
4,6 Dinitro-O-Cresol	NF
2,4 Dinitrophenol	NF
2 Nitrophenol	NF
4 Nitrophenol	NF
P Chloro-M-Cresol	NF
Pentachlorophenol	NF
Phenol	NF
2,4,6 Trichlorophenol	NF
Other	

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8406-166-0120 (11.89g extraction) (1:10 dil)

SAMPLE DESCRIPTION: Composite Sludge (Third Run)

GC/MS FRACTION

ACID COMPOUNDS

Units of Concentration ug/L ____

mg/L ____

Other mg/

Detection Limit 5 mg/kg

Quantitation Limit = 50 mg/kg

2 Chlorophenol	NF
2,4 Dichlorophenol	NF
2,4 Dimethylphenol	NF
4,6 Dinitro-O-Cresol	NF
2,4 Dinitrophenol	NF
2 Nitrophenol	NF
4 Nitrophenol	NF
P Chloro-M-Cresol	NF
Pentachlorophenol	NF
Phenol	NF
2,4,6 Trichlorophenol	NF
Other	

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0120 (1:100 dilution)

SAMPLE DESCRIPTION: Composite Sludge
(Second Run)

GC/MS FRACTION

BASE/NEUTRAL COMPOUNDS

Units of Concentration µg/L ____

mg/L ____

Other mg/k

Detection Limit = 100 mg/kg
Limit of Quantitation = 250 mg

Acenaphthene	NF	Diethyl Phthalate	NF
Acenaphthylene	NF	Dimethyl Phthalate	NF
Anthracene	NF	Di-N-Butyl Phthalate	NF
Benzidine	NF	2,4 Dinitrotoluene	NF
Benzo(a) Anthracene	NF	2,6 Dinitrotoluene	NF
Benzo(a) Pyrene	NF	Di-N-Octyl Phthalate	NF
3,4 Benzo-fluoranthene	NF	1,2 Diphenyl hydrazine	NF
Benzo(ghi) Perylene	NF	Fluoranthene	NF
Benzo (k) fluoranthene	NF	Fluorene	NF
Bis (2-chloroethoxy) Methane	NF	Hexachlorobenzene	NF
Bis (2-chloroethyl) ether	NF	Hexachlorobutadiene	NF
Bis (2-chloroisopropyl) ether	NF	Hexachlorocyclopentadiene	NF
Bis (2-ethyl hexyl) phthalate	NF	Hexachloroethane	NF
4 Bromophenyl phenyl ether	NF	Indeno (1,2,3-cd) Pyrene	NF
Butyl Benzyl Phthalate	NF	Isophorone	NF
2-Chloronaphthalene	NF	Naphthalene	NF
4-Chlorophenyl phenyl ether	NF	Nitrobenzene	NF
Chrysene	NF	N-Nitrosodimethylamine	NF
Dibenzo(a,h) Anthracene	NF	N-Nitroso di-N-propylamine	NF
1,2 Dichlorobenzene	NF	N-Nitrosodiphenylamine	NF
1,3 Dichlorobenzene	NF	Phenanthrene	NF
1,4 Dichlorobenzene	NF	Pyrene	NF
3,3' Dichlorobenzidine	NF	1,2,4 Trichlorobenzene	NF

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: B405-166-0120 (11.89g extraction) (1:10 dil)

SAMPLE DESCRIPTION: Composite Sludge (Third Run)

GC/MS FRACTION

BASE/NEUTRAL COMPOUNDS

Units of Concentration µg/L ____

mg/L ____

Quantitation Limit 50mg/kg Other mg/k

Detection Limit 5 mg/kg

Acenaphthene	NF	Diethyl Phthalate	NF
Acenaphthylene	NF	Dimethyl Phthalate	NF
Anthracene	NF	Di-N-Butyl Phthalate	5 < x < 5
Benzidine	NF	2,4 Dinitrotoluene	NF
Benzo(a) Anthracene	NF	2,6 Dinitrotoluene	NF
Benzo(a) Pyrene	NF	Di-N-Octyl Phthalate	5 < x < 5
3,4 Benzo-fluoranthene	NF	1,2 Diphenyl hydrazine	NF
Benzo(ghi) Perylene	NF	Fluoranthene	NF
Benzo (k) fluoranthene	NF	Fluorene	NF
Bis (2-chloroethoxy) Methane	NF	Hexachlorobenzene	NF
Bis (2-chloroethyl) ether	NF	Hexachlorobutadiene	NF
Bis (2-chloroisopropyl) ether	NF	Hexachlorocyclopentadiene	NF
Bis (2-ethyl hexyl) phthalate	96	Hexachloroethane	NF
4 Bromophenyl phenyl ether	NF	Indeno (1,2,3-cd) Pyrene	NF
Butyl Benzyl Phthalate	NF	Isophorone	5 < x < 5
2-Chloronaphthalene	NF	Naphthalene	5 < x < 5
4-Chlorophenyl phenyl ether	NF	Nitrobenzene	NF
Chrysene	NF	N-Nitrosodimethylamine	NF
Dibenzo(a,h) Anthracene	NF	N-Nitroso di-N-propylamine	NF
1,2 Dichlorobenzene	NF	N-Nitrosodiphenylamine	NF
1,3 Dichlorobenzene	NF	Phenanthrene	NF
1,4 Dichlorobenzene	NF	Pyrene	NF
3,3' Dichlorobenzidine	NF	1,2,4 Trichlorobenzene	NF

BAYONE INDUSTRIES, INC.

OILY SLUDGE COMPOSITE

RFW 8405-166-0210

GC/MS FRACTION

VOLATILE COMPOUNDS

Units of Concentration ug/l ___
mg/kg X

Acrolein	NF	Methylene Chloride	NF
Acrylonitrile	NF	1,1,2,2 Tetrachloroethane	NF
Benzene	1<x<10	Tetrachloroethylene	NF
Bis (chloromethyl) Ether	NF	Toluene	1<x<1
Bromoform	NF	1,2 Trans Dichloroethylene	NF
Carbon Tetrachloride	NF	1,1,2 Trichloroethane	NF
Chlorobenzene	1<x<10	1,1,1 Trichloroethane	NF
Chlorodibromomethane	NF	Trichloroethylene	NF
Chloroethane	NF	Trichlorofluoromethane	NF
2-Chloroethylvinyl Ether	NF	Vinyl Chloride	NF
Chloroform	NF	Other	
Dichlorobromomethane	NF		
Dichlorodifluoromethane	NF		
1,1 Dichloroethane	NF		
1,2 Dichloroethane	NF		
1,1 Dichloroethylene	NF		
1,2 Dichloropropane	NF		
1,2 Dichloropropylene	NF		
Ethylbenzene	1<x<10		
Methyl Bromide	NF		
Methyl Chloride	NF		

BAYONE INDUSTRIES, INC.

OILY SLUDGE COMPOSITE

RFW 8405-166-0120

GC/MS FRACTION
PESTICIDES

Units of Concentration ug/L _____

mg/kg X

Aldrin	< 2.50	PCB 1232	< 12.50
a-BHC	< 13.29	PCB 1248	< 12.50
B-BHC	< 1.25	PCB 1260	< 25.00
Y-BHC	< 3.75	PCB 1016	< 12.50
δ-BHC	< 1.25	Toxaphene	< 62.50
Chlordane	< 12.50	Other	
4,4' DDT	< 12.50		
4,4' DDE	< 2.50		
4,4' DDD	< 1.25		
Dieldrin	< 2.50		
α-Endosulfan	< 1.25		
B-Endosulfan	< 2.50		
Endosulfan	< 1.25		
Endrin	< 5.00		
Endrin Aldehyde	< 1.25		
Heptachlor	< 2.50		
Heptachlor Epoxide	< 2.50		
PCB-1242	< 12.50		
PCB-1254	< 25.00		
PCB-1221	< 12.50		

ATTACHMENT E

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0160 (1:100 dilution)

SAMPLE DESCRIPTION: Composite Cinders

(SECOND RUN)

GC/MS FRACTION

ACID COMPOUNDS

Units of Concentration ug/L ___

mg/L ___

Other mg/

Detection Limit = 100 mg/kg

Quantitation Limit = 250 mg/kg

2 Chlorophenol	NF
2,4 Dichlorophenol	NF
2,4 Dimethylphenol	NF
4,6 Dinitro-O-Cresol	NF
2,4 Dinitrophenol	NF
2 Nitrophenol	NF
4 Nitrophenol	NF
P Chloro-M-Cresol	NF
Pentachlorophenol	NF
Phenol	NF
2,4,6 Trichlorophenol	NF
Other	

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0150 (10.21g extraction) (1:10 dil)

SAMPLE DESCRIPTION: Cinders LOC 2

GC/MS FRACTION

ACID COMPOUNDS

Units of Concentration ug/L ____

mg/L ____

Other mg/

Detection Limit: 10 mg/kg (conc. below D.L.)

Quantitation Limit = 100 mg/kg

2 Chlorophenol	NF
2,4 Dichlorophenol	NF
2,4 Dimethylphenol	NF
4,6 Dinitro-O-Cresol	NF
2,4 Dinitrophenol	NF
2 Nitrophenol	NF
4 Nitrophenol	NF
P Chloro-M-Cresol	NF
Pentachlorophenol	NF
Phenol	NF
2,4,6 Trichlorophenol	NF
Other	

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0160 (1:100 dilution)

SAMPLE DESCRIPTION: Composite Cinders

(SECOND RUN)

GC/MS FRACTION

BASE/NEUTRAL COMPOUNDS

Units of Concentration µg/L ____

mg/L ____

Limit of Quantitation 250 mg/kg Other mg/

Detection Limit = 100 mg/kg

Acenaphthene		Diethyl Phthalate	
Acenaphthylene		Dimethyl Phthalate	
Anthracene		Di-N-Butyl Phthalate	420
Benzidine		2,4 Dinitrotoluene	
Benzo(a) Anthracene		2,6 Dinitrotoluene	
Benzo(a) Pyrene		Di-N-Octyl Phthalate	
3,4 Benzo-fluoranthene		1,2 Diphenyl hydrazine	
Benzo(ghi) Perylene		Fluoranthene	
Benzo (k) fluoranthene		Fluorene	
Bis (2-chloroethoxy) Methane		Hexachlorobenzene	
Bis (2-chloroethyl) ether		Hexachlorobutadiene	
Bis (2-chloroisopropyl) ether		Hexachlorocyclopentadiene	
Bis (2-ethyl hexyl) phthalate		Hexachloroethane	
4 Bromophenyl phenyl ether		Indeno (1,2,3-cd) Pyrene	
Butyl Benzyl Phthalate		Isophorone	
2-Chloronaphthalene		Naphthalene	
4-Chlorophenyl phenyl ether		Nitrobenzene	
Chrysene		N-Nitrosodimethylamine	
Dibenzo(a,h) Anthracene		N-Nitroso di-N-propylamine	
1,2 Dichlorobenzene		N-Nitro odiphenylamine	
1,3 Dichlorobenzene		Phenanthrene	
1,4 Dichlorobenzene		Pyrene	
3,3' Dichlorobenzidine		1,2,4 Trichlorobenzene	

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0150 (10.21g extraction) (1:10 dil)

SAMPLE DESCRIPTION: Cinders Location #2

GC/MS FRACTION

BASE/NEUTRAL COMPOUNDS

Units of Concentration µg/L ____

mg/L ____

Quantitation Limit 100 mg/kg Other mg/k

Detection Limit: 10 mg/kg (conc. below D.L.)

Acenaphthene	NF	Diethyl Phthalate	NF
Acenaphthylene	NF	Dimethyl Phthalate	NF
Anthracene	NF	Di-N-Butyl Phthalate	10 < x < 1
Benzidine	NF	2,4 Dinitrotoluene	NF
Benzo(a) Anthracene	NF	2,6 Dinitrotoluene	NF
Benzo(a) Pyrene	NF	Di-N-Octyl Phthalate	NF
3,4 Benzo-fluoranthene	NF	1,2 Diphenyl hydrazine	NF
Benzo(ghi) Perylene	NF	Fluoranthene	NF
Benzo (k) fluoranthene	NF	Fluorene	NF
Bis (2-chloroethoxy) Methane	NF	Hexachlorobenzene	NF [1]
Bis (2-chloroethyl) ether	NF	Hexachlorobutadiene	NF
Bis (2-chloroisopropyl) ether	NF	Hexachlorocyclopentadiene	NF
Bis (2-ethyl hexyl) phthalate	NF	Hexachloroethane	NF
4 Bromophenyl phenyl ether	NF	Indeno (1,2,3-cd) Pyrene	NF
Butyl Benzyl Phthalate	NF	Isophorone	10 < x < 1
2-Chloronaphthalene	NF	Naphthalene	NF
4-Chlorophenyl phenyl ether	NF	Nitrobenzene	NF
Chrysene	NF	N-Nitrosodimethylamine	NF
Dibenzo(a,h) Anthracene	NF	N-Nitroso di-N-propylamine	NF
1,2 Dichlorobenzene	NF	N-Nitrosodiphenylamine	NF
1,3 Dichlorobenzene	NF	Phenanthrene	NF
1,4 Dichlorobenzene	NF	Pyrene	NF
3,3' Dichlorobenzidine	NF	1,2,4 Trichlorobenzene	NF
		Other	NF

BAYONE INDUSTRIES, INC.

CINDER COMPOSITE

RFW 8405-166-160

GC/MS FRACTION

VOLATILE COMPOUNDS

Units of Concentration µg/g ____
mg/L ____
Other mg/k

Acrolein	NF	Methylene Chloride	NF
Acrylonitrile	NF	1,1,2,2 Tetrachloroethane	NF
Benzene	1<x<10	Tetrachloroethylene	NF
Bis (chloromethyl) Ether	NF	Toluene	1<x<10
Bromoform	NF	1,2 Trans Dichloroethylene	NF
Carbon Tetrachloride	NF	1,1,2 Trichloroethane	NF
Chlorobenzene	11.	1,1,1 Trichloroethane	NF
Chlorodibromomethane	NF	Trichloroethylene	NF
Chloroethane	NF	Trichlorofluoromethane	NF
2-Chloroethylvinyl Ether	NF	Vinyl Chloride	NF
Chloroform	NF	Other	NF
Dichlorobromomethane	NF		
Dichlorodifluoromethane	NF		
1,1 Dichloroethane	NF		
1,2 Dichloroethane	NF		
1,1 Dichloroethylene	NF		
1,2 Dichloropropane	NF		
1,2 Dichloropropylene	NF		
Ethylbenzene	1<x<10		
Methyl Bromide	NF		
Methyl Chloride	NF		

BAYONE INDUSTIRES, INC.

CINDER COMPOSITE

RFW 8405-166-160

GC/MS FRACTION

PESTICIDES

Units of Concentration mg/kg

Aldrin	< 0.024	**PCB 1232**	< 0.120
a-BHC	< 0.012	**PCB 1248**	< 0.120
B-BHC	< 0.012	**PCB 1260**	< 0.240
Y-BHC	< 0.036	**PCB 1016**	< 0.120
δ-BHC	< 0.012	Toxaphene	< 0.600
Chlordane	< 0.120	**Other**	
4,4' DDT	< 0.120		
4,4' DDE	< 0.024		
4,4' DDD	< 0.120		
Dieldrin	< 0.024		
α-Endosulfan	< 0.012		
B-Endosulfan	< 0.024		
Endosulfan	< 0.012		
Endrin	< 0.0476		
Endrin Aldehyde	< 0.012		
Heptachlor	< 0.024		
Heptachlor Epoxide	< 0.024		
PCB-1242	< 0.120		
PCB-1254	< 0.120		
PCB-1221	< 0.120		

ATTACHMENT F

BAYONE INDUSTRIES, INC.

Red Clay Soil Composite

KFW 8405-166-200

(First Run)

GC/MS FRACTION

ACID COMPOUNDS

Units of Concentration ug/kg _____

mg/L _____

mg/kg X

2 Chlorophenol	NF
2,4 Dichlorophenol	NF
2,4 Dimethylphenol	NF
4,6 Dinitro-O-Cresol	NF
2,4 Dinitrophenol	NF
2 Nitrophenol	NF
4 Nitrophenol	NF
P Chloro-M-Cresol	NF
Pentachlorophenol	NF
Phenol	NF
2,4,6 Trichlorophenol	NF
Other	
_____	_____
_____	_____
_____	_____
_____	_____

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0200 (1:100 dilution)

SAMPLE DESCRIPTION: Composite Red Clay
(Second Run)

GC/MS FRACTION

ACID COMPOUNDS

Units of Concentration ug/L ____
mg/L ____
Other mg/

Detection Limit = 100 mg/kg
Limit of Quantitation = 250 mg

2 Chlorophenol	NF
2,4 Dichlorophenol	NF
2,4 Dimethylphenol	NF
4,6 Dinitro-O-Cresol	NF
2,4 Dinitrophenol	NF
2 Nitrophenol	NF
4 Nitrophenol	NF
P Chloro-M-Cresol	NF
Pentachlorophenol	NF
Phenol	NF
2,4,6 Trichlorophenol	NF
Other	

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0200

SAMPLE DESCRIPTION: Composite Red Clay
(Second Run)

GC/MS FRACTION

ACID COMPOUNDS

Units of Concentration ug/L ___
mg/L ___
Other mg/

Detection Limit = 1 mg/kg

Quantitation Limit = 2.5 mg/kg

2 Chlorophenol	NF
2,4 Dichlorophenol	NF
2,4 Dimethylphenol	NF
4,6 Dinitro-O-Cresol	NF
2,4 Dinitrophenol	NF
2 Nitrophenol	NF
4 Nitrophenol	NF
P Chloro-M-Cresol	NF
Pentachlorophenol	NF
henol	NF
2,4,6 Trichlorophenol	NF
Other	

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0200 (1:100 dilution)

SAMPLE DESCRIPTION: Composite Red Clay
(Second Run)

GC/MS FRACTION
BASE/NEUTRAL COMPOUNDS

Units of Concentration µg/L ____
mg/L ____

Quantitation Limit 250mg/kg Other mg/l

Detection Limit = 100 mg/kg

Acenaphthene	NF	Diethyl Phthalate	NF
Acenaphthylene	NF	Dimethyl Phthalate	NF
Anthracene	NF	Di-N-Butyl Phthalate	NF
Benzidine	NF	2,4 Dinitrotoluene	NF
Benzo(a) Anthracene	NF	2,6 Dinitrotoluene	NF
Benzo(a) Pyrene	NF	Di-N-Octyl Phthalate	NF
3,4 Benzo-fluoranthene	NF	1,2 Diphenyl hydrazine	NF
Benzo(ghI) Perylene	NF	Fluoranthene	NF
Benzo (k) fluoranthene	NF	Fluorene	NF
Bis (2-chloroethoxy) Methane	NF	Hexachlorobenzene	NF
Bis (2-chloroethyl) ether	NF	Hexachlorobutadiene	NF
Bis (2-chloroisopropyl) ether	NF	Hexachlorocyclopentadiene	NF
Bis (2-ethyl hexyl) phthalate	NF	Hexachloroethane	NF
4 Bromophenyl phenyl ether	NF	Indeno (1,2,3-cd) Pyrene	NF
Butyl Benzyl Phthalate	NF	Isophorone	NF
2-Chloronaphthalene	NF	Naphthalene	NF
4-Chlorophenyl phenyl ether	NF	Nitrobenzene	NF
Chrysene	NF	N-Nitrosodimethylamine	NF
Dibenzo(a,h) Anthracene	NF	N-Nitroso di-N-propylamine	NF
1,2 Dichlorobenzene	NF	N-Nitrosodiphenylamine	NF
1,3 Dichlorobenzene	NF	Phenanthrene	NF
1,4 Dichlorobenzene	NF	Pyrene	NF
3,3' Dichlorobenzidine	NF	1,2,4 Trichlorobenzene	NF
		Other	NF

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8406-166-0200

SAMPLE DESCRIPTION: Composite Red Clay
(Second Run)

GC/MS FRACTION

BASE/NEUTRAL COMPOUNDS

Units of Concentration µg/L ____
mg/L ____
Other mg/kg

Quantitation Limit 2.5mg/kg

Detection Limit = 1 mg/kg

Acenaphthene	NF	Diethyl Phthalate	NF
Acenaphthylene		Dimethyl Phthalate	NF
Anthracene		Di-N-Butyl Phthalate	1 < x < 2.
Benzidine		2,4 Dinitrotoluene	NF
Benzo(a) Anthracene		2,6 Dinitrotoluene	
Benzo(a) Pyrene		Di-N-Octyl Phthalate	
3,4 Benzo-fluoranthene		1,2 Diphenyl hydrazine	
Benzo(ghi) Perylene		Fluoranthene	
Benzo (k) fluoranthene		Fluorene	
Bis (2-chloroethoxy) Methane		Hexachlorobenzene	
Bis (2-chloroethyl) ether		Hexachlorobutadiene	
Bis (2-chloroisopropyl) ether		Hexachlorocyclopentadiene	
Bis (2-ethyl hexyl) phthalate		Hexachloroethane	
4 Bromophenyl phenyl ether		Indeno (1,2,3-cd) Pyrene	
Butyl Benzyl Phthalate		Isophorone	
2-Chloronaphthalene		Naphthalene	
4-Chlorophenyl phenyl ether		Nitrobenzene	
Chrysene		N-Nitrosodimethylamine	
Dibenzo(a,h) Anthracene		N-Nitroso di-N-propylamine	
1,2 Dichlorobenzene		N-Nitrosodiphenylamine	
1,3 Dichlorobenzene		Phenanthrene	
1,4 Dichlorobenzene		Pyrene	
3,3' Dichlorobenzidine	V	1,2,4 Trichlorobenzene	
		Other	V

BAYONE INDUSTRIES, INC.

Red Clay Soil Composite

RFW 8405-166-200

GC/MS FRACTION

VOLATILE COMPOUNDS

Units of Concentration µg/g ___
mg/L ___
mg/kg X

Acrolein	NF	Methylene Chloride	NF
Acrylonitrile	NF	1,1,2,2 Tetrachloroethane	NF
Benzene	NF	Tetrachloroethylene	NF
Bis (chloromethyl) Ether	NF	Toluene	NF
Bromoform	NF	1,2 Trans Dichloroethylene	NF
Carbon Tetrachloride	NF	1,1,2 Trichloroethane	NF
Chlorobenzene	NF	1,1,1 Trichloroethane	NF
Chlorodibromomethane	NF	Trichloroethylene	NF
Chloroethane	NF	Trichlorofluoromethane	NF
2-Chloroethylvinyl Ether	NF	Vinyl Chloride	NF
Chloroform	NF	Other	
Dichlorobromomethane	NF		
Dichlorodifluoromethane	NF		
1,1 Dichloroethane	NF		
1,2 Dichloroethane	NF		
1,1 Dichloroethylene	NF		
1,2 Dichloropropane	NF		
1,2 Dichloropropylene	NF		
Ethylbenzene	NF		
Methyl Bromide	NF		
Methyl Chloride	NF		

BAYONE INDUSTRIES, INC.

Red Clay Soil Composite

RFW 8405-166-200

GC/MS FRACTION
PESTICIDES

Units of Concentration mg/kg X

Aldrin	<0.001	PCB 1232	<0.005
a-BHC	<0.0005	PCB 1248	<0.005
B-BHC	<0.0005	PCB 1260	<0.010
Y-BHC	5.40	PCB 1016	<0.005
δ-BHC	16.21	Toxaphene	<0.024
Chlordane	<0.005	Other	
4,4' DDT	<0.005		
4,4' DDE	<0.001		
4,4' DDD	<0.005		
Dieldrin	<0.001		
α-Endosulfan	<0.0005		
B-Endosulfan	<.002		
Endosulfan	<0.0005		
Endrin	<0.001		
Endrin Aldehyde	<0.001		
Heptachlor	<0.005		
Heptachlor Epoxide	<0.001		
PCB-1242	<0.005		
PCB-1254	<0.010		
PCB-1221	<0.005		

ATTACHMENT G

QUALITY CONTROL SAMPLES

DATA SUMMARY FOR: BAYONNE INDUSTRIES

DATE: 28 April 1984

RFW SAMPLE NO: 8405-166-0080

SAMPLE DESCRIPTION: Composite Loc. 1 & 2 (Spike)*

GC/MS FRACTION

ACID COMPOUNDS

Units of Concentration ug/L X

mg/L

Other

Quantitation Limit = 10 ug/L

Detection Limit = 1 ug/L

2 Chlorophenol	
2,4 Dichlorophenol	
2,4 Dimethylphenol	
4,6 Dinitro-O-Cresol	
2,4 Dinitrophenol	
2 Nitrophenol 28% R	14
4 Nitrophenol	
P Chloro-M-Cresol	
Pentachlorophenol	
Phenol	
2,4,6 Trichlorophenol	
Other	

*Spike = 50 ug/l

DATA SUMMARY FOR: BAYONNE INDUSTRIES

DATE: 28 April 1984

RFW SAMPLE NO: 8405-166-0080

SAMPLE DESCRIPTION: Comp. Loc. 1 & 2 (Spike)*

GC/MS FRACTION

BASE/NEUTRAL COMPOUNDS

Units of Concentration µg/L X

mg/L

Quantitation Limit = 10 ug/L
Detection Limit = 1 ug/L

Other

Acenaphthene		Diethyl Phthalate	
Acenaphthylene		Dimethyl Phthalate	
Anthracene		Di-N-Butyl Phthalate	
Benzidine		2,4 Dinitrotoluene	
Benzo(a) Anthracene		2,6 Dinitrotoluene	
Benzo(a) Pyrene		Di-N-Octyl Phthalate	
3,4 Benzo-fluoranthene		1,2 Diphenyl hydrazine	
Benzo(ghi) Perylene		Fluoranthene 156% R	78
Benzo (k) fluoranthene		Fluorene 38% R	19
Bis (2-chloroethoxy) Methane		Hexachlorobenzene	
Bis (2-chloroethyl) ether		Hexachlorobutadiene	
Bis (2-chloroisopropyl) ether		Hexachlorocyclopentadiene	
Bis (2-ethyl hexyl) phthalate		Hexachloroethane	
4 Bromophenyl phenyl ether		Indeno (1,2,3-cd) Pyrene	
Butyl Benzyl Phthalate		Isophorone	
2-Chloronaphthalene		Naphthalene 16% R	8
4-Chlorophenyl phenyl ether		Nitrobenzene	
Chrysene		N-Nitrosodimethylamine	
Dibenzo(a,h) Anthracene		N-Nitroso di-N-propylamine	
1,2 Dichlorobenzene		N-Nitrosodiphenylamine *	280
1,3 Dichlorobenzene		Phenanthrene	
1,4 Dichlorobenzene		Pyrene	
3,3' Dichlorobenzidine		1,2,4 Trichlorobenzene	
		Other	

*Spike = 50 ug/l

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8406-166-0120 MS*(10.25g extraction) (1:10 dil)

SAMPLE DESCRIPTION: Composite Sludge

GC/MS FRACTION

ACID COMPOUNDS

Units of Concentration ug/L ___

mg/L ___

Other mg/

Detection Limit: 1 mg/kg

Quantitation Limit = 5 mg/kg

2 Chlorophenol 34%R	17
2,4 Dichlorophenol	NF
2,4 Dimethylphenol	NF
4,6 Dinitro-O-Cresol	NF
2,4 Dinitrophenol	NF
2 Nitrophenol	NF
4 Nitrophenol 9%R	12 x 25
P Chloro-M-Cresol 13%R	6
Pentachlorophenol 34%R	17
Phenol 30%R	15
2,4,6 Trichlorophenol	NF
Other	NF

* matrix spike of 50 mg/kg

DATA SUMMARY FOR: Bayonne Industries

DATE: 28 April 1984

RFW SAMPLE #: 8405-166-0120 MS* (10.25g extraction) (1:10 dil)

SAMPLE DESCRIPTION: Composite Sludge

GC/MS FRACTION

BASE/NEUTRAL COMPOUNDS

Units of Concentration µg/L ____

mg/L ____

Quantitation Limit 5 mg/kg Other mg/k

Detection Limit: 1 mg/kg

Acenaphthene 106%R	53	Diethyl Phthalate	NF
Acenaphthylene	NF	Dimethyl Phthalate	NF
Anthracene	NF	Di-N-Butyl Phthalate 118%R	68
Benzidine	NF	2,4 Dinitrotoluene 58%R	29
Benzo(a) Anthracene	NF	2,6 Dinitrotoluene	NF
Benzo(a) Pyrene	NF	Di-N-Octyl Phthalate	NF
3,4 Benzo-fluoranthene	NF	1,2 Diphenyl hydrazine	NF
Benzo(ghi) Perylene	NF	Fluoranthene	NF
Benzo (k) fluoranthene	NF	Fluorene	NF
Bis (2-chloroethoxy) Methane	NF	Hexachlorobenzene	NF
Bis (2-chloroethyl) ether	NF	Hexachlorobutadiene	NF
Bis (2-chloroisopropyl) ether	NF	Hexachlorocyclopentadiene	NF
Bis (2-ethyl hexyl) phthalate	84	Hexachloroethane	NF
4 Bromophenyl phenyl ether	NF	Indeno (1,2,3-cd) Pyrene	NF
Butyl Benzyl Phthalate	NF	Isophorone	20
2-Chloronaphthalene	NF	Naphthalene	38
4-Chlorophenyl phenyl ether	NF	Nitrobenzene	NF
Chrysene	NF	N-Nitrosodimethylamine	NF
Dibenzo(a,h) Anthracene	NF	N-Nitroso di-N-propylamine 80%R	40
1,2 Dichlorobenzene	NF	N-Nitrosodiphenylamine	NF
1,3 Dichlorobenzene	NF	Phenanthrene	NF
1,4 Dichlorobenzene 84%R	42	Pyrene 100% R	50
3,3' Dichlorobenzidine	NF	1,2,4 Trichlorobenzene 74%R	37
		Other	NF

BAYONNE INDUSTRIES INCORPORATED

TABLE I

INORGANIC ANALYSIS RESULTS ON
THE SEPARATOR POND WATER
SLUDGE, CINDERS AND CLAY SAMPLES

SAMPLE DESCRIPTION	pH	CN	Sb	As	Ba	Be	Cd	Cr	Cu	Pb	Hg[1]	Ni	Se	Ag	Tl	Zn	Phenolics
WATER COMPOSITE	6.3	NF	NF	NF	.02	NF	NF	NF	.05	NF	*	NF	NF	NF	NF	.07	.011
SLUDGE COMPOSITE	--	--	NF	3.92	148	NF	NF	459	2311	2454	3.2	113	NF	NF	NF	1214	--
CINDERS COMPOSITE	--	--	NF	3.85	113	NF	NF	100	912	274	9.38	194	NF	NF	NF	358	--
RED CLAY	--	--	NF	0.78	69	NF	NF	18	58	56	NF	8	NF	NF	NF	88	--
EP TOXICITY ON SLUDGE COMPOSITE	--	--	--	NF	0.17	--	NF	NF	--	NF	NF	--	NF	NF	--	--	--
EP TOXICITY ON CINDERS COMPOSITE	--	--	--	NF	0.15	--	NF	NF	--	NF	NF	--	NF	NF	--	--	--
EP TOXICITY ON RED CLAY COMPOSITE	--	--	--	NF	.09	--	NF	NF	--	NF	NF	--	NF	NF	--	--	--

NOTE: ALL RESULTS IN mg/l UNLESS NOTED

* - INADEQUATE SAMPLE

1 - ug/g

ATTACHMENT H

Gilbert/Commonwealth engineers and consultants

GILBERT ASSOCIATES, INC., P. O. Box 1498, Reading, PA 19603 /Tel. 215 775-2600

CERTIFICATE OF ANALYSIS

LABORATORY NO. 30273 RECEIVED 6/20/84 REPORTED 6/22/84

CLIENT: Roy Weston, Inc, Weston Way
W. Chester, PA 19380

SAMPLE DESCRIPTION: Analysis of Solid Waste Sample #8405-166-0120

- - - - - -

I. Reactivity

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were detected when exposed to a pH condition of 12.5. Hydrogen sulfide gas was emitted at a pH of 2.

E. No toxic gases, vapors or fumes were detected when mixed with water.

F. No detonation or explosive reaction took place when subjected to 500°C in a muffle furnace.

G. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

II. Corrosivity

The sample was not corrosive according to the EPA's definition of corrosivity for a solid waste. A slurry of the sample in water had a pH of 7.2.

Respectfully submitted,

S. W. Hinnershitz

S. W. Hinnershitz, Chemist
Laboratory Services

MAE
cc: John Heemer (2)

Gilbert/Commonwealth engineers and consultants

GILBERT ASSOCIATES, INC., P. O. Box 1496, Reading, PA 19603 Tel: 215 775-2600

CERTIFICATE OF ANALYSIS

LABORATORY NO 30274 RECEIVED 6/20/84 REPORTED 6/22/84

CLIENT: Roy Weston, Inc, Weston Way
W. Chester, PA 19380

SAMPLE DESCRIPTION: Re: Analysis of Solid Waste Sample #8405-166-0160

- - - - - -

I. Reactivity

A. The sample was stable and did not undergo violent changes.

B. No reaction was noted when mixed with water.

C. No potential explosive mixtures were formed when mixed with water.

D. No toxic gases, vapors or fumes were detected when exposed to pH conditions between 2 and 12.5.

E. No toxic gases, vapors or fumes were detected when mixed with water.

F. No detonation or explosive reaction took place when subjected to 500°C in a muffle furnace.

G. The sample did not detonate, explosively decompose or react at standard temperatures and pressures.

II. Corrosivity

The sample was not corrosive according to the EPA's definition of corrosivity for a solid waste. A slurry of the sample in water had a pH of 7.3.

Respectfully submitted,

S.W. Hinnershitz

S. W. Hinnershitz, Chemist
Laboratory Services

MAE
cc: John Heemer (2)

Let's protect this earth

DEPARTMENT OF ENVIRONMENTAL PROTECTION
P.O. Box 1390
Trenton, N.J. 08625

PERMIT*

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachment accompanying same application, and applicable laws and regulations. This permit is also subject to the further condition and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit

Permit No.	Issuance Date	Effective Date	Expiration Date
00-0452-1	2-11-81	2-10-81	2-10-84

Name and Address of Applicant	Location of Activity/Facility	Name and Address of Owner
Bayonne Industries, Inc. Foot of East 22nd Street Bayonne, New Jersey 07002	Block No. 7 lot 3.1 City of Bayonne, Hudson Co.	Bayonne Industries, Inc. Foot of East 22nd Street Bayonne, New Jersey 07002

Issuing Division	Type of Permit	Statute(s)	Application No.
☐ Water Resources ☐ Coastal Resources ☐ Environmental Quality	Waterfront Development	12:5-3	00-0452-1

This permit grants permission to:

To fill, stabilize and contain oil and sludge solids of former separator pond on Block 7, lot 3.1 in the City of Bayonne, Hudson County.

Plans provide for the closure of a former separator pond handling collect waste water from the 1.6 acre terminal site.

A riparian grant was issued to the Central Railroad of New Jersey on December 17, 1877 Liber D, page 137. Bayonne Industries, Inc. acquired title from the Tide Water Oil Co. on February 15, 1956.

This permit is issued in accordance with Coastal Resource and Development Policy 7:7E-4.10(s) Miscellaneous. Filling of the separator pond is not a Water Area use specifically addressed in the Water Acceptability Table or in the Use Policies.

Under the Resource Policy for Water Quality (7:7E-3.4) any proposal which would prevent attainment of the defined standards for surface or groundwater is prohibited. The closure of the separator pond is expected to have a positive effect on the water quality and therefore is consistent.

This permit is issued subject to the following conditions:

1) Approval from the Department of the Army
2) Approval from the Solid Waste Administration, Bureau of Hazardous Waste
3) Monitoring results shall be submitted to the Solid Waste Administration Bureau of Hazardous Waste for their review and approval.
4) If migration of sludge is detected as a result of the required monitoring, then a clay dike will be installed outside of the existing dike which makes the sides of the lagoon/pond. The dike will be constructed as specified by the Bureau of Hazardous Waste.

Approved by the Department of Environmental Protection

_____ _____
DATE

Director, Division of Coastal Resources

The word permit means "approval, certification, etc."

(GENERAL CONDITI(

CCA000054

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
P. O. BOX 2809
TRENTON, NEW JERSEY 08625

File

Comm to Mike DEC 13 1977

DEC 07 1977

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Bayonne Industries, Inc.
Foot Of East 22nd Street
Bayonne, New Jersey 07002

Attention: Mr. R. Schwedfeger, President

Re: Approval No.Ind-R-77-3-3

Gentlemen:

There is enclosed an approval dated DEC 07 1977 issued to you pursuant to Title 58 of the revised Statutes of New Jersey and in consideration of your application dated June 29, 1977 signed by Mr. R. Schwedfeger, President.

This approval is for the construction and operation of a wastewater treatment plant located in Bayonne, New Jersey subject to the conditions as shown on the aforesaid approval and the following special provisos:

That the issuance of this approval does not imply, nor shall it be construed to imply, complaince with the 'Federal Water Pollution Control Act Amendments of 1972'. However, this permit has been developed so as to be compatible with current requirements of the aforesaid Federal Act.

We call your attention to the following comments:

(1) The flow equalization lagoon is lined with an oil resistant PVC or CPE liner. From time to time it may be necessary to bring in machinery to clean out this unit. We urge you to take suitable precautions to avoid damage to this liner.

(2) You should be aware that additional treatment may be required to meet future, more stringent requirements in recognition of the national scheme of step-wise reduction of water pollution and of the constantly advancing nature of technology which is the basis of many water pollution requirements.

(3) We understand that the Company stores a variety of chemicals including phenol, acetone, methanol, diisobutylene, calcium naphthenate, and other chemicals. We note that the proposed treatment plant is not designed to treat such chemicals. Therefore we have included a monitoring proviso in the permit to ascertain whether such compounds are present. In the event that such compounds are found you may be required to treat your wastewater for these materials.

CCA000054A

(4) We note that the proposed facilities are located in the flood plain of Kill Van Kull. You must therefore, obtain a stream encroachement permit from the Bureau of Flood Plain Management.

(5) We urge that the company institute a housekeeping campaign and inform this Department of the steps being taken.

(6) We note that the ground water contamination is known to exist at the Bayonne Industries site due to its use for many years of handling petroleum products and that residual oil appears in the groundwater. We are informed that a ground water study is under way and we would like to be informed of the methodology and results of this study.

By issuance of this permit, the Department does not assume any responsibility for the adequacy of the design and does not warrant or guarantee the proposed facilities. Furthermore, it will be the responsibility of the company to bring the proposed facilities into full compliance with the terms of the NPDES permit and all special requirements of this permit.

Very truly yours,

Richard E. Bellis, Assistant Director
Pollution Control Monitoring
Surveillance and Enforcement Element

E130:G21

cc: Mayor and Council of Bayonne
Dr. Richard Baker, USEPA
Mr. John Frisco, USEPA
Dr. Alan I. Mytelka, ISC.
Mr. Leroy Sullivan III, P.E., Environics Inc.

STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION
OF THE STATE OF NEW JERSEY

Approval Application No. S-Ind-R-77-3-3*

CERTIFICATION APPROVING APPLICATION OF

Bayonne Industries Incorporated
Foot of East 22nd Street,
Bayonne, NJ 07002

for permission to construct and operate a wastewater treatment plant.

Date DEC 07 1977 19

An application (*) having been duly made to the Department of Environmental Protection of the State of New Jersey, pursuant to the applicable provisions of Title 58 of the Revised Statutes of New Jersey for the approval of conditions under which

Bayonne Industries Incorporated, Bayonne, New Jersey

proposes to construct a wastewater treatment facility to provide for the treatment of 0.72MGD of wastewater. The facility consists of three lift stations, a gravity separator a flow equalization lagoon, two lagoon discharge pumps, a chemical feeder unit, a Vemco Hydro Cleaner Flotation unit (DAF), an oil detector, a flowmeter, and a sampling manhole. This facility is described by the final engineering report entitled "Proposed Installatio of Waste water Pumping, Retention, and Treatment Facilities at Bayonne Industries, Inc." dated July 6, 1977 and by final plans dated (various dates) and supplimentary information included in submittals dated August 31, 1977 and October 21, 1977 all signed and sealed by LeRoy Sullivan, III (NJPE 22982)
and to operate the same; therefore

*submitted by Bayonne Industries Incorporated dated June 29, 1977 signed by Raymond T. Schwedfeger, President. The effluent will be discharged to Platty Kill Creek, tributary to Kill Van Kull.

BP

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO GEORGE KLEIN, SITE MANAGER, BSM THROUGH: JOSEPH GOLISZEWSKI, CHIEF, IEAS 5/17/83

FROM JAMES PLUMMER, BEERA/IEAS DATE 17 MAY 1983

SUBJECT ADDITION OF BAYONNE INDUSTRIES TO THE NEW JERSEY HAZARDOUS WASTE SITE LIST

On Friday May 13, 1983 a meeting was held in conjunction with a review of Bayonne Industries designed to determine the company's suitability for inclusion on the New Jersey Hazardous Waste Site List. The following were in attendance:

Abraham Thomas, Vice President, Roy F. Weston Consultants
Robert Patel, DWM, BHWE
George Klein, Site Manager, BSM
James Plummer, BEERA/IEAS

The following report including recommendations is a result of the evaluation of collected data concerning the subject site gathered in response to the George Klein memo of March 11, 1983:

The Bayonne Industries facility located at the foot of east 22nd Street, Bayonne, New Jersey is a petroleum product (currently #2, #4, and #6 oils) storage and transfer facility. The entire site covers about 170 acres with about 10 acres being occupied by the two lessees, White Chemical Company and Roana-Pearl Inc. This property has supported industry for over 100 years. Former companies using the property include Southern California Oil and Tidewater Refining Company, from whom Bayonne Industries purchased the property 25 years ago.

An extensive contamination problem became apparent as a result of inspections by various governmental authorities including the Coast Guard and the state of New Jersey. The bulkhead along the Kill Van Kull was leaching an oily substance. Also much of the soil in the facility appeared discolored due to spills and poor housekeeping in general. In addition, the bulk of the transfer piping was underground. Bayonne Industries decided to hire a contractor to determine the extent and locate the source of the problem, and to devise a plan to practically eliminate it. One bidder proposed a 75 foot deep slurry wall along the Kill Van Kull, but this was considered infeasible. In May 1977 Roy F. Weston consultants were contracted to conduct a hydrogeological investigation of the subsurface occurrence of oil. Their plan included the installation of a network of 66 test wells. This system gave a complete picture of the hydrogeology.

The brackish water table in the area is shallow, located about 3 to 4 feet below ground surface. The groundwater flows toward the Kill Van Kull. The facility is supported by an average 15 feet of cinder fill. Below that is a 7 foot layer of clayey silt with vegetation known as meadow mat. It has a permeability of 10^{-5} to 10^{-7} cm/sec. Below this is the first freshwater aquifer, which is not a source of potable water. The entire city of Bayonne is on municipal water, and Bayonne Industries nor its lessees have production wells sunk into the aquifer of concern. Soil boring indicated no contamination of the meadow mat. The test well network indicated varying levels of oil product (several feet in some wells) on the surface of the water table throughout most of the area.

The priority concern was how to stop the bulkhead leaching. Weston proved that the oily product was escaping into Kill Van Kull only when the tide level in the Kill sank below the bottom of the bulkhead, which occurred during extreme tidal fluctuations such as a full moon. Thus the integrity of the bulkhead was not in question. However, it was certain that an extensive pool of oily product was being built up near the bulkhead, as well as a few locations elsewhere on the property. Weston's remedy was to sink 5 recovery wells which would pump off the surface oil. This effort proved so successful that a sorbent boom is no longer needed at the bulkhead and the present levels of oil in the test wells have dropped from several feet to a sheen.

Product soaked soils have been removed to a large degree although soil contamination does penetrate to a depth of 3-4 feet. Since the recovery well system seems to be adequately managing the problem, removal and replacement of soils is not deemed necessary or practical, especially in view of facility structural integrity. All underground piping has been placed above ground. Surface runoff was handled by collection at what is now called the old slop pond at the northern side of the facility. This pond is no longer used, however sludge samples were taken by the DEP and found to contain high levels of lead and phenols. About 90% of the oily sludge has been removed by Bayonne with the rest to be cleaned up shortly. Presently surface runoff is collected at the new separator lagoon which is then filtered through a Wemco separator. The effluent from the separator is pumped to a third lagoon which empties into the Platty Kill at the east side of the property. This lagoon is to be closed pending approval of Weston's closure proposal by the Bureau of Hazardous Waste Engineering. Their plan consists of in situ disposal of the inert sludge material. The liquid material in the lagoon will be pumped through the Wemco separator and the solid sludge will be dried using fly ash and covered with fill material and clay capped. A monitoring well will be placed outside of the clay dike to check its integrity.

A sampling program performed in 1981 by the then Division of Hazard Management Technical Service team turned up high levels of substances such as aldrin and BHC in the Wemco effluent. However, according to Abraham Thomas of Weston, subsequent sampling has revealed that these substances are no

longer present in the separator effluent. A full report of these findings are to be forwarded to the HSMA office. Bayonne is currently satisfying the conditions of its NJPDES permit.

HSMA needs to be assured that hazardous wastes are not leaving the boundaries of the site. I believe the Weston plan provides that assurance. The Bureau of Hazardous Waste Engineering should be allowed to maintain its supervision over the lagoon closure. Any HSMA suggestions in this area should be directed toward the BHWE. As the Wemco separator effluent has already been tested for suspected hazardous substances, a priority pollutant scan would seem to be an unwarranted imposition unless the DEP provides the funding. Supervision of the sludge removal in the old slop pond should be exercised, yet it is not clear as to whether HSMA, BHWE, or the DWM enforcement element should take that responsibility. As this is an active facility general housekeeping problems could be regulated through enforcement (BFO) or the DPCC program if appropriate. The closure and relocation of the White Chemical facility should be a HSMA concern since Bayonne Industries inherits the responsibilities for clean-up. Bayonne is well aware of this and intends to closely monitor White's closure activities. Sampling reports from White soils and the Bayonne Wemco separator are to be forwarded by Weston to HSMA. Based upon the information in this report, it is my evaluation that at the present time placing Bayonne Industries on New Jersey's Hazardous Waste Site list is not justified.

HS26:aa

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO Frank Coolick

FROM B. M. Patel DATE 4/12/1983

SUBJECT Site Visit - Proposed closure plan of former oil/water sludge pond, Bayonne Industries, Inc., Bayonne, Hudson County, File #10084

On Thursday, April 7, 1983, Bob Patel and Tom Sherman visited the above referenced facility. The purpose of this site visit was to perform visual observations of the condition of the pond and the general areas surrounding it.

Abraham Thomas, Consulting Engineer from Roy F. Weston, Inc. and Walter Pytlik, Plant Engineer of Bayonne Industries met us at the company's business office. The representatives of the company explained the history of the half acre pond which had been used to collect all runoff water from the 180-acre industrial complex, and to skim off floating oils before discharge to Pratty Kill Creek.

Bayonne Industries, Inc. stores petroleum type oils in aboveground tanks. In 1976, the company installed an oil/water separator to treat all waste waters of the site and eliminated the use of the pond.

Mr. Thomas advised that he has performed geological and hydrological studies of the site since the mid 70's in response to complaints by the Division of Water Resources regarding oil contamination of groundwater. Frank Markiewicz of Water Resources also participated in these studies.

During 1977, the U.S. Coast Guard noticed an oil sheen on the Pratty Kill Creek, which leads to Kill Van Kull. Bayonne Industries has been confronted with an oil slick and/or sheen problem emanating from the pond. Bayonne Industries, Inc. has submitted a closure plan for the pond to the Bureau of Hazardous Waste Engineering to eliminate these problems.

During the site visit, we observed that the separator pond is located within the property lines of the Bayonne Industrial complex. Bayonne Industries, Inc. is to the north, south and west. Exxon Company is located in the northeast and the Pratty Kill Creek is to the east. A dike separates the pond from Pratty Kill Creek.

We noticed a thin layer of oil on the top surface of the pond. The water level was low and the exposed inner walls of the pond were visibly stained with dark oily residue. Mr. Thomas advised that his studies revealed the upper three to four feet of the sludge to be very light, but the sludge becomes more dense with depth. He estimates the total volume of sludge in the pond to be approximately 2,460,000 gallons. Based on Weston's field investigations and hydrogeologic studies and bench scale testing, the oil and grease content of the sludge is primarily composed of hydrocarbons and the sludge contains about 60% (dry basis) dirt. There exists a continuous seven feet thick clay layer along the bottom of the separator pond. Subsurface borings and laboratory analyses have indicated that there is no migration of contaminants from the pond into the clay layer. The groundwater elevation outside the pond's perimeter bulkhead is higher than the water elevation in the pond, which indicates that the bulkhead is very tight and acts effectively as a groundwater barrier similar to a cutoff wall

CCA000058

We also observed where two borings had been made on the surface of the dike which separates the pond from Pratty Kill Creek. The dike is made with tight sand and quarry stones. Contaminant migration through the dike is restricted by a 1/16" nylon reinforced membrane and a "mud fence". Mr. Thomas advised that the two test borings did not show any evidence of oil contamination of the bottom clay layer. Monitoring wells installed on each side of the membrane showed an oil thickness of 0.25 feet on the pond side of the membrane and no oil on the creek side of the membrane. At the time of the site visit, it was raining and we observed a discharge of waste in the pond from Rona Pearl, a tenant of the Bayonne Industrial Complex. Other tenants, White Chemical Company and Metropolitan Rendering have used the pond to discharge wastes previously. However, White Chemical Company and Metropolitan Rendering have closed their plants and moved out of the complex. Bayonne Industries, Inc. no longer discharges any waste water into the pond.

At the end of the facility visit. the representatives of the facility provided their EPA ID NO. NJD048809487. This EPA ID Number is not for the pond, but it is for Bayonne Industries, Inc., which is a generator only.

Conclusions and Recommendations:

1. Based on observations during the site visit, the continuous clay layer at the bottom of the pond, the relatively tight bulkhead construction on the three sides of the pond and the relatively impermeable dikes on the fourth side, and the relatively inert nature of sludge wastes in the pond, the proposed closure method of pumping the oily water to the separator facility and then encapsulating the remaining sludge appears feasible to eliminate oil sheen problems in the Pratty Kill Creek.

2. The Bureau does not agree to use construction rubble to fill in the pond. Inert soil should be used in place of rubble.

3. Install a minimum of two gas vents to handle gas generation due to bio-degradation of the oil components of the sludge in the pond.

4. Install one groundwater monitoring well, minimum 4" diameter, at the dike of the pond, to enable monitoring of any leaching through the dike.

B. M. Patel

BMP:jb

DM#12

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Bob Patel

FROM Dan Toder, Geology DATE March 17, 1981

SUBJECT Bayonne Industries' Closure for Separator Pond

In reviewing these Designs many deficiencies were noted:

1. Even though Weston says oil cannot penetrate their dike, oil has been observed in monitor wells (page 2-2). Weston says that this may be due to one well being on the pond side & one well on the river side. They don't know for sure.

2. Neoprene membrane does not penetrate the full length of dike. MWD fence permeability is not given & is not connected to neoprene membrane. There is a space between these two barriers (DWG#A-14-926).

3. Dike is made of sand, & permeability is not known.

4. Permeability of clay on bottom of pond is not known.

5. They do not plan to use sheet piling. They will use it only if oil is detected migrating through the dike. There already has been oil found in one of the wells located in the dike.

6. Composition of flyash is not known.

7. On page 4-1, the report says no contaminants have migrated into the clay however, sample 4 (in table 3-1) taken from the clay bottom shows (mg/1) 17,200 COD), phenol. 7, Fe 96.4, Pb. .09, Cr. 08 Hg. .03, As. .03 Cn <30.0. These are all way above water standards.

8. Only two monitor wells are installed, in the dike. Other wells should be installed to monitor other bulkheads.

Dan Toder

Dan Toder

cc: files

gw

Bob R. d
Your comment.
R

11/20/80
Bob P

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
P. O. BOX CN-029
TRENTON, NEW JERSEY 08625

ARNOLD SCHIFFMAN
DIRECTOR

MEMORANDUM

TO: Ralph Pasceri, Bureau of Hazardous Waste, SWA

FROM: Dave Kaplan through Dick Dalton and Haig Kasabach, Bureau of Ground Water Management

SUBJECT: Bayonne Industries Inc., Sludge Pond, Bayonne, Hudson Co. (#10084)

1. The above facility is in an urban, industrial area surrounded by various petrochemical storage companies. The Platty Kill is adjacent to the east, and empties into the Kill Van Kull 1000' to the south.

2. The application is for the closure of a ½ acre oil/water separator pond on a 180 acre oil storage site. The pond contains 11-15' of waste oil and sludge with 4-9' of water standing on top of the sludge.

   Bayonne Industries has been confronted with an oil slick and/or sheen problem emanating from the separator pond. It was determined that the most attractive alternative is closure of the pond by pumping the oily water to the seperator and encapsulating the remaining sludge in-situ .

   Primary steps in the closure program include:

   A. Reroute present discharge lines.
   B. Plug existing separator pond effluent lines.
   C. Pump oily water to separator.
   D. Backfill with non-biodegradable construction/demolition rubble and soil and compact.
   E. Stabilize sludge with flyash or air drying.
   F. Install a 2' clay layer over the completed dike.
   G. Install monitor wells at the dike. Sheet piling will be installed if there is evidence of oil migration through the dike.

3. The pond is separated from the Platty Kill by a sand and quarrystone dike. Contaminant migration through the dike is restircted by a 1/16" nylon reinforced neoprene membrane and a "mud fence".

   A clay liner is located along the bottom of the separator pond. It consists of Triassic residual red clay - "tight and clean". Borings indicate that there is no migration of contaminants from the pond into the clay layer. The clay acts as a natural liner.

4. A site inspection was made on October 30, 1980. The pond is surrounded on three sides by fuel storage tanks and buildings. An oil sheen is on the pond surface, and the effluent entering the Platty Kill also has a sheen. Two uncapped 1" well points have been installed on the dike.

5. Conclusions - Assuming that the underlaying clay layer is continuious and impereable (as indicated by the borings), there will be no vertical migration of contaminants. However, the report does not indicate the soil composition in the surrounding areas, and there is the possibility of horizontal movement. Therefore, at least one additional monitor well (minimum 2" diameter) should be installed, west of the lagoon.

   In addition, the two well points on the dike should be replaced. They are too small to be baled, and pumping them will obsure any oil layer floating on the water table. One new well (minimum diameter 2") would be sufficient to monitor possible leakage through the dike.

cc: Bill Brown

WQM2: ljs

DM#12

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO MR. TOM SHERMAN

FROM B.M. PATEL DATE JANUARY 19, 1981

SUBJECT BAYONNE INDUSTRIES, INC., PROPOSED CLOSURE PLAN OF FORMER OIL/WATER SLUDGE POND FACILITY, BAYONNE, HUDSON COUNTY, FILE # 10084.

As per our discussions of January 12, 1981, I have prepared the following report pertaining to the above referenced facility.

HISTORY

During 1977, U.S. Coast Guard has noticed oil sheen in the Pratty Kill Creek leading to Kill Van Kull. The oil sheen was coming from the separator pond of Bayonne Industries. The process of discharging all waste water to the pond resulted in a buildup of sludge and oily waste in the separator pond. Bayonne Industries, Inc. retained Roy F. Weston, Inc. to develop a strategy to address and evaluate a solution to this problem.

On September 29, 1980, the Solid Waste Administration received the registration statement, engineering plans and report covering the evaluation of control alternatives for the closure of the separator pond. On October 9, 1980, the Bureau of Hazardous Waste had forwarded the registration statement, plans and report to internal and external agencies for review and comments.

LOCATION AND BACKGROUND

The separator pond is located within the property lines of the Bayonne Industries in Bayonne. The separator pond is approximately half an acre in size. The Bayonne Industries, Inc. is in north, south and west. The Exxon Company is located in the northeast and the Pratty Kill Creek is in the east. The dike separates the sludge pond and the Pratty Kill Creek.

The Bayonne Industries, Inc. stores fuel oil in tanks on the property, 180 acres in size. In addition, tenants on the property handle and store various chemicals and some tallow. All wastewater from the treatment plant of Bayonne Industries passes through the oil separator before being discharged to the separator pond and eventually into the Platty Kill. However, there are four tenants in the yard discharging their effluents to the separator pond through three separate discharge lines. Oil and other floating substances in the pond are being skimmed off continuously. In addition to the dike across the Pratty Kill, a floating boom in the separator pond is also used to contain and collect oil. The drain pipe through the dike discharges water from the pond to the Pratty Kill.

WASTE IN THE SEPARATOR POND

The applicant has provided five borings in the pond to determine the nature of the material. In addition, two borings are construed in the dike to determine the nature of the material in the dike. The location of these borings are shown in Figure 1 and boring logs are ginen in Appendix A.

It can be seen from the data of the boring logs and Figure 2 that the oily sludge in the pond overlies red silty clay. The thickness of the clay layer is

about seven feet. The thickness of the sludge varied from 11 to 15 feet. The upper three to four feet of the sludge is very light and the sludge becomes more dense with depth. The oily water level is approximately eight to ten feet. The total volume of sludge in the pond is approximately 2,460,000 gallons.

The analytical results of the sludge and soil samples taken at various depths at the boring locations indicated that the levels of lead and phenols in the sludge are high. The ash content of sludge is high, 60 to 80% range. There is a high iron content, 96mg/kg, in the clay and is naturally occurring as confirmed from the analysis of a soil sample randomly collected in the plant area. Data has indicated that there is little migration of contaminants (Cu, Cr, Zn, Hg, As, Ni) in the clay which is located along the bottom of the separator pond. The analytical results of sludge and soil are included in Appendix II.

It can be seen from Figure 2 that the ground water level on the south and north sides of the pond is about two to three feet above the water surface in the pond. Water surfaces in the pond and the Pratty Kill Creek and water levels vary with low and high tides. The Pratty Kill shows three to four feet of tidal fluctuation, whereas the fluctuation in the pond varies less than two feet. This indicates some degree of barrier action of the dike. The dike is made with sand and quarry stones. It is important to note that the oily water and oily sludge of the pond are within the groundwater table.

EVALUATION OF ALTERNATIVE METHODS

The following alternative methods are provided for pond closure:

a. In-place burial
b. Excavation and off-site disposal of sludge
c. Excavation and on-site disposal management
d. In-place fixation
e. Combination of two or more of the above methods

The alternatives of off-site sludge disposal and on-site sludge disposal at a controlled location other than the separator pond were studied. Due to the high level of phenol and lead in the sludge, off-site disposal must be in a secure landfill due to potential liability considerations. The estimated transportation and disposal cost are prohibitive for disposal of sludge in the two near secure landfills, Niagara Falls, New York and Cincinnati, Ohio. Problems are also anticipated with the permitting, handling, and interstate transporation of this sludge.

On-site disposal in a suitably prepared area would require the construction of a liner system for leachate control. The shallow water table at the Bayonne Industries is not favorable for the construction of a secure landfill on-site.

The chemically stabilizing the contaminants of sludge would involve excavation of the sludge, mixing of the sludge with a fixing ingredient and return of the mixture to the pond. The fixation processes are still in the experimental stages and have not been successful in chemically binding leachate contaminants in the sludge mixture matrix. Because of the unlikely success of chemical fixation and prohibitive cost, these processes are ruled out for use at Bayonne Industries.

The alternative method for closure of the pond is by pumping the oily water to the WEMCO separator and encapsulating the remaining sludge in-situ. The proposed steps in the pond closure plan are as follows:

a. Reroute present discharge lines.
b. Plug existing separator pond effluent lines.
c. Pump oily water to the WEMCO separator.
d. Backfill with construction/demolition rubble and soil and compact.
e. Stabilize any sloppy sludge with flyash or air drying and integrate dry sludge. with soil backfill operations.
f. Install a clay layer over the completed pond.
g. Install a monitoring well at the dike.

CONCLUSIONS

1. The oily sludge is highly organic and the sludge has high levels of phenol and low levels of lead. Therefore, sludge disposal should be in a secure landfill.

2. The contaminants of sludge have not migrated into the clay at the pit bottom. Soil borings within the pond depict a layer of cinders, stones, wood, and oily sand under the sludge and above the impermeable layer. The underlying porous material would provide an avenue for dispersion and migration of oil contaminant leachate beyond the existing lagoon.

3. There was no conclusive evident sample data provided to determine any possible lateral migration of contaminants associated with waste.

4. The dike is made up of sand and quarry stone. The water surfaces in the Pratty Kill and pond vary with tidal fluctuation. There exixts a shallow water table at the plant. The sludge waste of the pond is within the shallow water table.

5. The applicant has not provided a more detailed cost analysis for the disposal method of sludge in a secure off-site facility.

RECOMMENDATIONS

1. Among the several alternative methods, the proposed method pertaining to close the former oil/water separator pond by pumping the oily water to the existing WEMCO separator and encapsulating the remaining sludge in-situ is not acceptable due to the following:

   a. The shallow water table exists at the plant.
   b. There is a lack of evidence that there is no possible lateral migration of sludge contaminants.
   c. The oily water and sludge waste of the separator pond are within the ground-water level.

2. It is recommended that the applicant should provide a detailed cost analysis for the method of sludge disposal in a secure off-site.

cc: Bob Reed

BMP/1

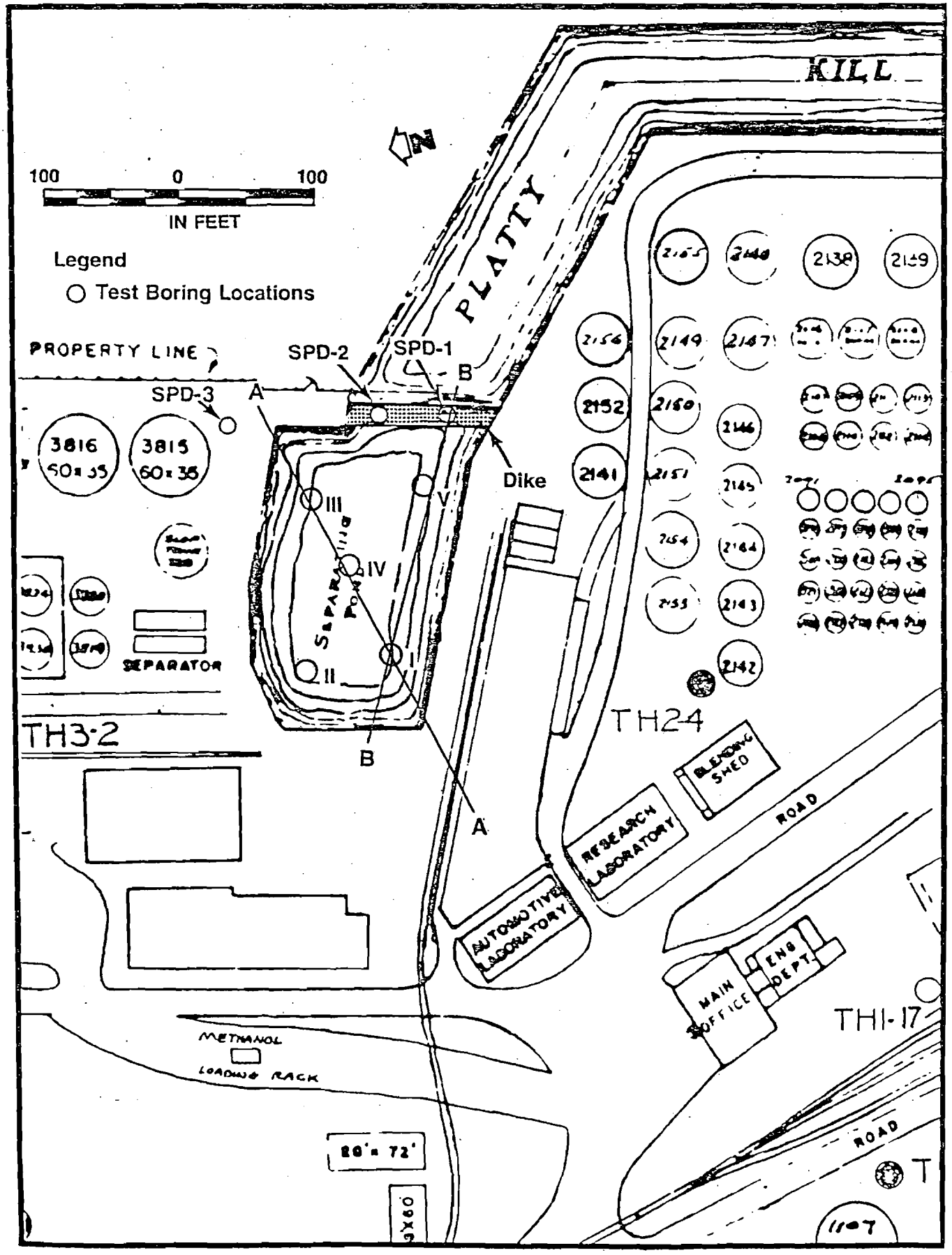
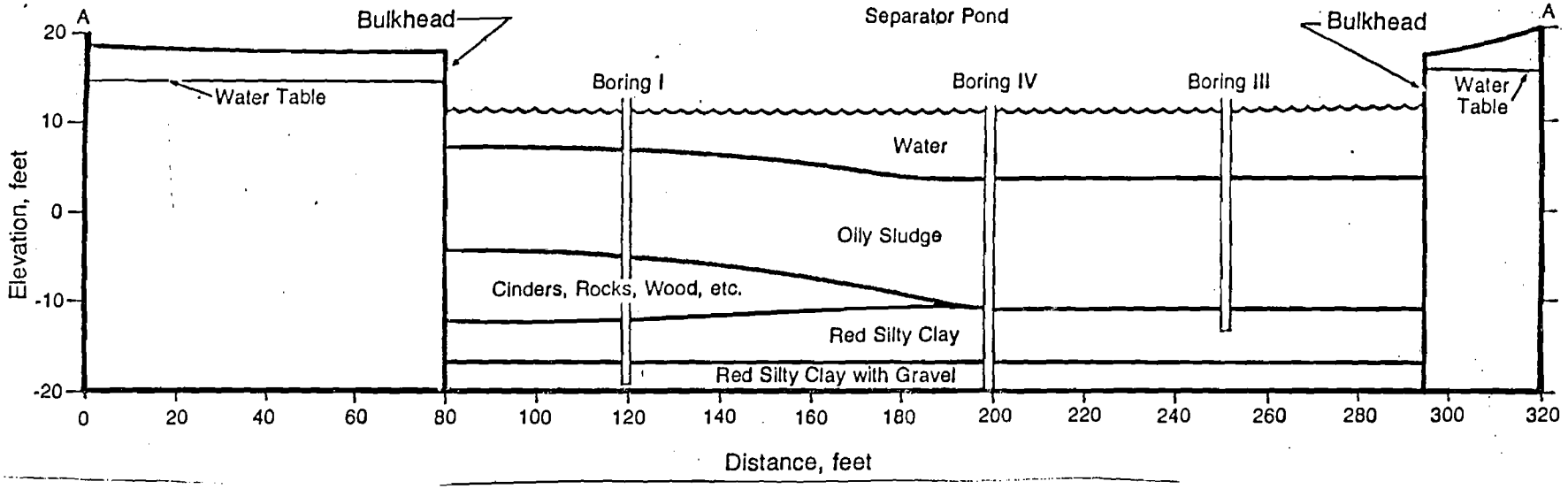
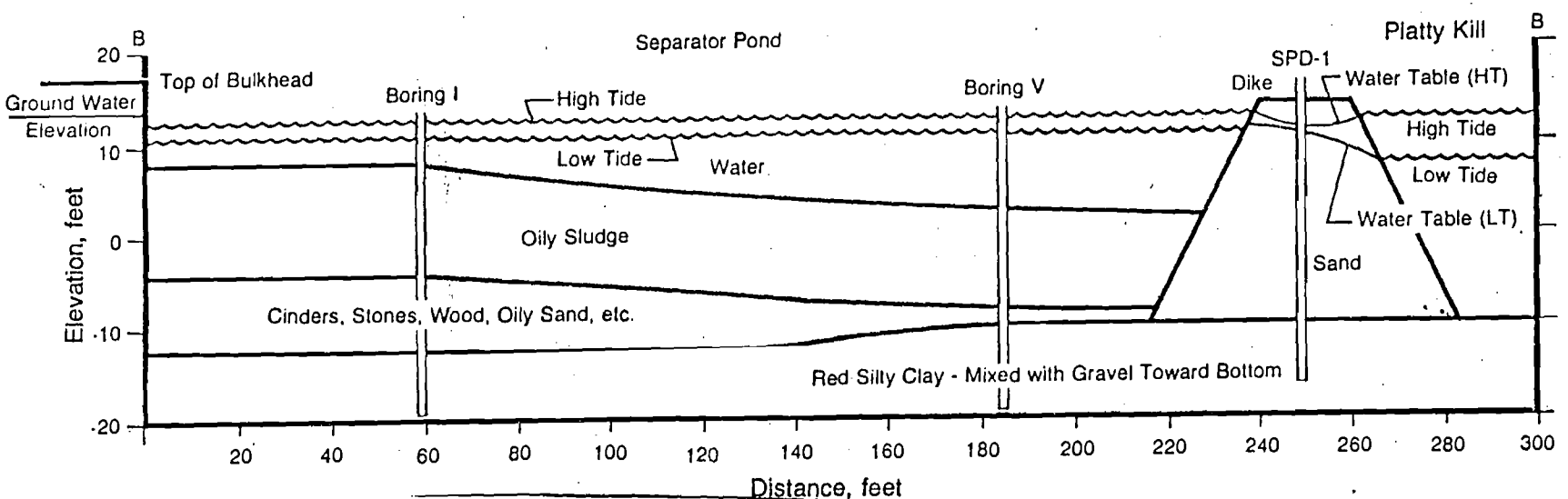


Figure 1 Plot Plan



CROSS SECTION A-A PROFILE OF SEPARATOR POND SHOWING WATER LEVELS, SLUDGE THICKNESS, NATURE OF SUBSURFACE MATERIAL IN THE POND, AND WATER TABLE AROUND THE POND



CROSS SECTION B-B - SHOWING WATER ELEVATIONS IN THE POND AND PLATTY KILL, AND GROUND WATER ELEVATIONS IN THE DIKE AT HIGH AND LOW TIDES

FIGURE 2

3.6.7 Potential Former Surface Impoundments

A number of possible former surface impoundments were noted on the aerial photographs in the northeast portion of Yard 6. One of these impoundments were noted in the 1959 aerial photograph east of tanks 6008 and 6009. This area was noted on all aerial photographs from 1959 through 1977.

A drainage area was first noted in the 1959 aerial photograph going from the dike area surrounding Tanks 6002, 6007, 6008, 6009 and 6010, into the vacant area north of the Tank Yard. This drainage area was much larger and more apparent in the 1963 aerial photograph, and absent in the 1970 and subsequent photos.

A large area of "ponded water" was first noted on the extreme northeast corner of Yard 6 in the 1970 aerial photograph. Remnants of the pond was apparent on the 1977 photograph and reappearance of a small pond in the same area on the 1984 photograph was also noted.

Three new rectangular areas were also first noted in the 1970 aerial photograph along the east border of Yards 6 and 10. These three areas were also present on the 1977 photograph, but no longer present in the 1984 and subsequent photographs.

3.6.8 Underground Product Lines

Seven active product lines have been identified in Yard 6. Six of these lines are used to transport No. 6 fuel oil primarily, and one is used to transport MTBE.

3.7 Yard 8

Yard 8 is approximately three acres in size and has until recently been leased to Rona Pearl. This yard is bordered to the north by Yard 1, to the west by Yard 4, and to the south by Yard 3. Rona Pearl has vacated the premises and their site has cleared the ISRA process.

3.8 Yard 9

Yard 9 includes the Platty Kill Pond and the Platty Kill Canal located along the southeast boundary of the property. This yard is bordered to the east by the former Exxon Lubricant Plant property, to the south by the Kill van Kull, to the west by Yard 2, and to the north and west by Yard 3. The size of the Platty Kill Pond is approximately 140 feet wide by 250 feet long by 15 feet deep. It is enclosed by wooden bulkheads on three sides and an earthen dike on the fourth side. The pond is known to contain water and petroleum sludge. Approximately 8 to 10 feet of

sludge has been reported in the bottom of the pond, in 1978 and 1989. Recent sludge measurements indicate a thickness of 4 to 5 feet.

Until the mid-1950s, the Platty Kill Pond may have received all stormwater runoff and process water from the refinery and other tenants at the facility. When the refinery operations ceased in the mid-1950s, the only discharge from the facility to the pond was stormwater runoff. In 1978, an air floatation unit was installed by Bayonne Industries to treat stormwater runoff prior to discharge to the pond. In 1986, all discharges to the pond were discontinued and re-routed to the Platty Kill Creek. ENSR Consulting and Engineering began bioremediation of the residual petroleum sludge in the pond in the late summer of 1990. The most recent progress of this program is discussed in the Platty Kill Pond 1995 Operating Season Progress Report dated April 1996. One shallow monitoring well and soil boring were installed and sampled on the western side of the pond during the Phase I RI activities. These results are provided in Section 5.0 and 6.0.

As part of the 1994 Platty Kill Canal IRM, samples were collected from the Platty Kill Canal to characterize the sediments in the canal. A total of sixteen 10-foot sediment cores were collected using a portable vibratory cover mounted on a pontoon work platform. Eight of the cores collected were from outside the dam at the mouth of the canal, four were collected from the mid-section of the canal, and four were collected from the northern section of the canal, in the area south of the Platty Kill Pond earthen dike. A total of 32 sediment samples, plus quality assurance samples, were collected and analyzed. Two samples were collected from each sediment core, one from the 0- to 5-foot depth interval and one from the 5- to 10-foot depth interval. Results of this investigation were provided to the NJDEP in the Platty Kill Canal Interim Remedial Action Report, dated November 1995. A second round of sediment samples were collected from the canal in June 1996, the results of which will be submitted to the NJDEP in a Platty Kill Canal Phase 2 Sediment Investigation Report. Additional work will be proposed for this area in the very near future including a proposal for the use of the mid-section of the canal as a dredge spoils disposal area.

3.9 Yard 10

Yard 10 encompasses approximately nine acres in the center of the Bayonne Industries site. This area is currently leased by CO-GEN Technologies and is the location of a cogeneration plant. Yard 10 is bordered to the north by the railroad right-of-way, to the east by Yard 3, to the south by Yard 1, and the White Chemical area, and to the west by Yard 6. Southern California Chemical Company, a former tenant on the Bayonne Industries property, formerly located in the plate shop building, moved from the site at some point between 1984 and 1989, based on aerial photographs. The location of this building has been paved and is encompassed within the CO-

9 feet below grade. Headspace PID readings taken from soil samples ranged from 25 ppm (13- to 15-foot depth interval) to 166 ppm (2- to 4-foot depth interval). Soil sample Y9-PKP-SS-01A was collected from 0 to 0.5 feet below grade. Soil sample Y9-PKP-SS-01B was collected from 2 to 4 feet below grade where the highest field PID reading was detected. Soil sample Y9-PKP-SS-01C was collected from 4 to 6 feet below grade, the interval above the water table.

5.14.1 Yard 9 - Platty Kill Pond Soil Results

The results of the three soil samples collected from soil boring Y9-PKP-SS-01 are summarized in Table 5-17. Figure 5-16 presents a soil sample results map for the Platty Kill Pond indicating compounds that exceed the applicable NJIGWSC. Soil sample Y9-PKP-SS-01A was collected from a depth of 0 to 0.5 feet and was only analyzed for TPH. Benzene concentrations were present in the two samples, Y9-PKP-SS-01B and Y9-PKP-SS-01C, at levels of 1,100 and 9,200 ug/kg, respectively, which exceed the 1,000 ug/kg NJIGWSC. All other volatile organic compounds detected were below their respective NJIGWSC and NJNRSCC. All semivolatile organic compounds detected were below their respective NJIGWSC. TPH concentrations in the two samples collected below a depth of 2 feet were 20,500 mg/kg (Y9-PKP-SS-01B) and 47,300 mg/kg (Y9-PKP-SS-01C), which exceed the 10,000 mg/kg total organic compound soil cleanup criteria. The TPH concentration in the surface soil sample collected, Y9-PKP-SS-O1A, was below 10,000 mg/kg. All metals detected in the samples collected were below their respective NJNRSCC.

TAE 7
YARD 9 - PLATTY KILL POND SOIL SAMPLE SUMMARY
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

SAMPLING NAME LAB ID NUMBER SAMPLING DEPTH SAMPLING DATE		Y9-PKP-SS-01A 51960008 0.0 to 0.5 ft. 05/04/95	Y9-PKP-SS-01B 51960009 2.0 to 4.0 ft. 05/04/95	Y9-PKP-SS-01C 51960010 4.0 to 6.0 ft. 05/04/95	NEW JERSEY NON-RESIDENTIAL SOIL CLEANUP CRITERIA	NEW JERSEY IMPACT TO GW SOIL CLEANUP CRITERIA
Benzene	UG/KG	NA	1100 J	9200	13000	1000
Toluene	UG/KG	NA		810	1000000	500000
Total Xylenes	UG/KG	NA		1100 J	1000000	10000
2-Methylnaphthalene	UG/KG	NA	700 J	850 J	NC	NC
Acenaphthene	UG/KG	NA	620 J	240 J	10000000	100000
Acenaphthylene	UG/KG	NA	470 J		NC	NC
Anthracene	UG/KG	NA	560 J		10000000	500000
Benzo(a)Anthracene	UG/KG	NA	1300 J	540 J	4000	500000
Benzo(a)Pyrene	UG/KG	NA	1100 J	770 J	660	100000
Benzo(b)Fluoranthene	UG/KG	NA	1100 J	450 J	4000	500000
Benzo(g,h,i)Perylene	UG/KG	NA	770 J	460 J	NC	NC
Benzo(k)Fluoranthene	UG/KG	NA	440 J	240 J	4000	500000
Bis(2-Ethylhexyl)Phthalate	UG/KG	NA	260 J		210000	100000
Chrysene	UG/KG	NA	2300	850 J	40000	500000
Di-n-Butylphthalate	UG/KG	NA		370 J	10000000	100000
Dibenz(a,h)Anthracene	UG/KG	NA	200 J	330 J	660	500000
Fluoranthene	UG/KG	NA	1100 J	270 J	10000000	500000
Fluorene	UG/KG	NA	750 J		10000000	100000
Indeno(1,2,3-cd)Pyrene	UG/KG	NA	370 J	230 J	4000	500000
N-Nitrosodiphenylamine	UG/KG	NA		420 J	600000	100000
Naphthalene	UG/KG	NA	430 J		4200000	100000
Phenanthrene	UG/KG	NA	1100 J	800 J	NC	NC
Pyrene	UG/KG	NA	4500	800 J	10000000	500000
Aluminum	MG/KG	NA	2550	2180	NC	NC
Antimony	MG/KG	NA	34.9	1.8 BJ	340	NC
Arsenic	MG/KG	NA	10.5	8.4	20	NC
Barium	MG/KG	NA	61.4	51.1	47000	NC
Beryllium	MG/KG	NA	0.23 BJ	0.28 BJ	1	NC
Cadmium	MG/KG	NA	0.41 BJ	0.75 J	100	NC
Calcium	MG/KG	NA	2640	3760	NC	NC
Chromium	MG/KG	NA	12.9	9.3	NC	NC
Cobalt	MG/KG	NA	9.3	7.5	NC	NC
Copper	MG/KG	NA	52.4	50.2	600	NC
Iron	MG/KG	NA	9480	19200	NC	NC
Lead	MG/KG	NA	237	234	600	NC
Magnesium	MG/KG	NA	1430	1370	NC	NC
Manganese	MG/KG	NA	63.5	91	NC	NC
Mercury	MG/KG	NA	0.58	0.36	270	NC
Nickel	MG/KG	NA	16.8	69.8	2400	NC
Potassium	MG/KG	NA	366	304	NC	NC
Selenium	MG/KG	NA	0.94	1.2	3100	NC
Sodium	MG/KG	NA	216	350 J	NC	NC
Vanadium	MG/KG	NA	51.9	204	7100	NC
Zinc	MG/KG	NA	75.1	153	1500	NC
Petroleum Hydrocarbons	MG/KG	2800 J	20500 J	47300 J	10000	10000

ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
NA - Not analyzed
NC - No NJDEP criteria currently exists
DL - Diluted reanalysis
J - Estimated value, compound detected below the practical quantitation limit
E - Estimate, exceeds calibration range
BJ - Estimate, due to blank contamination
B - Analyte also found in method blank
* - For quality purposes, diluted analyses of samples were used for reporting
Blank - not detected above specified detection limit

BAYONNE INDUSTRIES, INC.

FOOT OF EAST 22ND STREET P. O. BOX 67 BAYONNE, NEW JERSEY 07002

J. J. FRUCHTMANN
VICE PRESIDENT - OPERATIONS

PHONE: (201) 437-2200

April 4, 1984

Mr. Arnold Schiffman, Assistant Director
Division of Water Resources
New Jersey Pollution Discharge Elimination System
CN 029
1474 Prospect Street
Trenton, New Jersey 08625

Dear Mr. Schiffman:

On October 31, 1976 Bayonne Industries, Inc. was issued NPDES Permit No. NJ 001341.

On April 29, 1981 Bayonne Industries, Inc. applied for a renewal of its NPDES Permit. We were subsequently advised that jurisdiction for that permit was transferred to the State of New Jersey. To date we have not received the renewal permit.

At such time when you are about to issue the renewal permit we request that you add IMTT-Bayonne as co-holder or co-possessor of the permit. This request results from Bayonne Industries, Inc. leasing all of its facilities to an affiliate organization known as IMTT-Bayonne. In the future IMTT-Bayonne will replace Bayonne Industries as the operating entity. Bayonne Industries will continue to own the property.

In light of the above do you require any other documentation?

Very truly yours,

BAYONNE INDUSTRIES, INC.

J. J. Fruchtmann
Vice President - Operations

JJF/cls

RECEIVED
APR 06 1984
STATE OF NEW JERSEY
DEPT. ENVIRONMENTAL PROTECTION
DIVISION WATER RESOURCES

CCA000065

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEw YORK, NEW YORK 10278

SEP 20 12 00 PM
DIV WATER RESOURCES
MS&E

09-21-83

BAYONNE INDUSTRIES INC
FOOT OF EAST 22ND STREET
BAYONNE NJ 07002

RE- NPDES PERMIT DELINQUENT DISCHARGE
SELF-MONITORING REPORT
NPDES PERMIT NO. NJ0001341

DEAR SIR,

YOUR FACILITY HAS BEEN ISSUED A NATIONAL OR STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (N/SPDES) PERMIT WHICH AUTHORIZES YOU TO DISCHARGE WASTEWATER INTO THE SURFACE WATERS OF THE UNITED STATES. ACCORDING TO THE TERMS OF YOUR PERMIT, YOU ARE REQUIRED TO SUBMIT A DISCHARGE MONITORING REPORT (DMR) EVERY 3 MONTHS.

YOU WERE REQUIRED TO SUBMIT A DMR COVERING THE PERIOD ENDING 07-31-83 (MONTH/DAY/YEAR) NO LATER THAN 08-28-83 (MONTH/DAY/YEAR). OUR RECORDS SHOW THAT YOU HAVE NOT MET THIS REQUIREMENT. YOUR PERMIT CONTAINS FURTHER INFORMATION REGARDING THESE REQUIREMENTS.

CONSEQUENTLY, YOU ARE REQUESTED TO SUBMIT THE REQUIRED DMR TO RICHARD A. BAKER, CHIEF, PERMITS ADMINISTRATION BRANCH WITHIN 14 DAYS OF THE DATE OF THIS LETTER. FAILURE TO COMPLY WITH THIS REQUEST MAY RESULT IN FURTHER ENFORCEMENT ACTION UNDER THE CLEAN WATER ACT. WE THEREFORE URGE YOU TO GIVE THIS MATTER YOUR IMMEDIATE ATTENTION.

IF YOU HAVE ANY QUESTIONS REGARDING YOUR PERMIT REQUIREMENTS, PLEASE WRITE TO THE WATER & HAZARDOUS WASTE COMPLIANCE SECTION, PERMITS ADMINISTRATION BRANCH AT THE ABOVE ADDRESS, OR CALL 212-264-9880. THANK YOU FOR YOUR COOPERATION WITH THE NPDES PERMIT PROGRAM.

SINCERELY YOURS,
RICHARD L. CASPE
CHIEF
WATER FACILITIES BRANCH
WATER MANAGEMENT DIVISION

GP	LAST	A/E
13	8302	604D

CCA000068

FILE 09-01-15

BAYONNE TERMINAL WAREHOUSE CORPORATION

FOOT OF EAST 22ND STREET • P. O. BOX 281 • BAYONNE, NEW JERSEY 07002

PHONE: (201) 437-2200

October 8, 1982

Mr. Edward J. Faille, Jr.
Mr. Vincent S. Krisak
Mr. Charles Krauss
State of New Jersey
Department of Environmental Protection
Division of Hazardous Waste Management
120 Route 256
Yardville, New Jersey 08620

Gentlemen:

Response is made to my letters of June 25, 1982 and August 26, 1982. As outlined in my letter of June 25, 1982, Weston has collected and analyzed samples from the Wemco discharge, Platty Kill Separator Pond and the old main gate area. The results of the testing are given below:

1.) Wemco Water Samples

The results of testing of water samples from the Wemco discharge are given in Table 1. Weston's study did not indicate the presence of Aldrin or lead.

2.) Lagoon Liner

A dye test was performed by me on August 26, 1982 and August 27, 1982 and no evidence of the dye was found in any down gradient recovery wells or sewers.

3.) Platty Kill Separator Pond

Samples of top layer sludge from the old separator pond were collected--both from the north side and from the south side. The results of the analyses of several representative samples are given in Table 2.

...//..

3.) Platty Kill Separator Pond (continued)

As can be seen from the table, Weston's testing confirmed elevated levels of copper and lead in the top layers of the sludge. Weston will be conducting an additional investigation to determine a technically feasible alternative to handle the elevated levels of copper and lead during the proposed closure of the Platty Kill Separator Pond. We expect Weston to complete their investigation within 90 days. Upon completion of the investigation, a study report will be submitted to you with recommended modifications of the closure plan which is currently pending with the State.

4.) Old Main Gate Pond Area

Weston has collected four samples of sludge from the general area where DEP had collected samples. The analytical results are summarized in Table 3. As can be seen from this table, Weston testing indicated elevated levels of several metals, but did not show any volatile organics. Weston will be evaluating the alternatives for the ultimate disposal of this sludge during their investigation of the Separator Pond sludge. The recommended alternative will be submitted to you along with the report on the Separator Pond for your review and approval within the aforenoted 90 day period.

5.) Plasticizer Loading Area

We have completed installation of a new Plasticizer permanent containment system.

6.) Oil Contaminated Soil

Approximately 90% of all the oil contaminated areas in the plant have now been cleaned-up. Some of the oil contaminated soil has been shipped to an approved landfill while the remainder is now being stored on enclosed concrete foundations. We will continue to dispose of all semi-solid contaminated soil off the premises. It is our intention to dispose of all solid contaminated soil in the encapsulation of the Platty Kill Separator Pond.

...//..

If you should have any questions or wish to discuss the matter further, please feel free to contact me.

Very truly yours,

BAYONNE TERMINAL WAREHOUSE CORPORATION

W. S. Pytlik, P.E.
Plant Engineer

WSP/cls

cc: Mr. Abraham Thomas

Table 1

BAYONNE INDUSTRIES INC., BAYONNE, NEW JERSEY

WEMCO WATER SAMPLE
SAMPLE COLLECTED ON 8/16/82

WESTON NO.	Parameters	Concentrations
19033	Aldrin	NF
19033	Lead	NF (<.01)

Table 2

BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY
OLD SEPARATOR POND - SLUDGE SAMPLE

Sampled on 8/16/82

WESTON No.	Parameters	Concentrations (mg/kg)	Percent Moisture	NJ DEP Data 10/30/81 (ppm)	Samples 7/79 (mg/kg)
North Side					
19034	Copper	1840	64	1,800	2.8
19034	Lead	335	64	460	1.9
South Side					
19035	Copper	5588	62.5	3,200	
19035	Lead	409	62.5	390	

Table 3

BAYONNE INDUSTRIES, INC., BAYONNE, NEW JERSEY
OLD MAIN GATE - SLUDGE SAMPLES
Sampled on 8/16/82

Parameters	Sample #1 RFW #19036 (mg/kg)	Sample #2 RFW #19037 (mg/kg)	Sample #3 RFW #19038 (mg/kg)	Sample #4 RFW #19039 (mg/kg)
Arsenic	518.00	21.40	37.60	1097.00
Cadmium	1.20	2.20	2.99	1.79
Chromium	10.90	200.00	30.76	30.60
Copper	75.00	180.00	356.00	376.00
Lead	1216.40	284.00	6140.00	4294.00
Mercury	3.80	<0.50	<0.50	8.50
Nickel	6.80	64.00	22.19	15.40
Zinc	55.00	164.00	332.00	140.00
T. Cyanide	0.41	0.12	*	<0.10
P,P DDD	NF	NF	NF	NF
DDT	NF	NF	NF	NF
Methylene Chloride	NF	NF	NF	NF
Chloroform	NF	NF	NF	NF
1,2 Dichloroethane	NF	NF	NF	NF
Benzene	NF	NF	NF	NF
Tetrachloroethylene	NF	NF	NF	NF

* - High sulfide interface

NOTE: All results expressed on a wet weight basis.

ADM-012

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Spill File

FROM Scott Santora, Stephen Borgianini, & Joseph Buttich DATE December 29, 1981

SUBJECT BAYONNE INDUSTRIES, INC. FOOT OF EAST 22nd STREET, BAYONNE, NEW JERSEY

PURPOSE OF VISIT: To conduct sampling for EPA Priority Pollutants and Poly Brominated Biphenyls at various locations throughout the subject facility.

N.J.D.H.M. CASE NUMBER: 81-10-24-4

VISIT DATE: Friday, October 30, 1981 0900 to 1545 hours.

REPORT DATE: December 28, 1981

PERSONS INTERVIEWED OR CONTACTED AT SITE:
A) Paul Russ - Environmental and Safety Manager

B) Walter Pytlik - Plant Manager

C) Ed Faille - Supervising Technician, NJDHM

D) Charles Krauss - Supervisor, Bureau of Enforcement, NJDHM

I. OBSERVATIONS:
A) Friday, October 30, 1981
At 0905 hours, Mr. Santora, Mr. Borgianini, and Mr. Buttich arrived at the subject company's main office and contacted Mr. Pytlik, Mr. Russ, Mr. Faille, and Mr. Krauss, who were already on scene. It was determined at that time that sampling of the oil-water separator's surface would be conducted first.

At 0922 hours, Mr. Buttich and Mr. Borgianini took sample no. 1 from the surface of the oil-water separator (see attached plot diagram). This sample was collected in a clean 500 ml glass container attached to a clean glass tube. NOTE: All glassware used during sampling operations were cleaned and sealed by the Stablex-Reutter Laboratory. The 500 ml container was rinsed three times with the oil-water separator's contents prior to an actual sample being taken. The sample was then poured into two other cleaned 500 ml glass containers. Both containers were then labeled and sealed, and one sample was given to Mr. Pytlik, and the other sample was placed in ice.

At 0934 hours, sampling of the surface of the oil-water separator was completed and everyone traveled to storage tank (TK-1176).

At 0942 hours, sampling of the no. 6 oil (High Pour) spill that had previously occured from the over-filling of TK-1176 (see attached plot plan) was taken by Joseph Buttich. The sample was very viscous, and a clean gloved "hand sample" had to be taken. The sample was collected in two clean 1000 ml glass containers. Both samples were labeled and sealed, and one of the sealed samples was given to Mr. Pytlik, and the other was packed in ice. This sample was labeled no. 2.

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At 0952 hours, sampling of TK-1176 no. 6 oil spill was completed, and everyone traveled to the discharge line of the "Wemco" separator.

At 1005 hours, sampling of the Wemco separator discharge to the sewer line was conducted by Mr. Buttich and Mr. Borgianini in the manhole adjacent to the separator. Four 40 ml vials and four 1 liter amber bottles of discharge water were taken. The samples were labeled no. 3 and sealed. Two 40 ml vials and two 1 liter bottles of discharge water samples taken were given to Mr. Pytlik, and the other samples were then placed in ice storage.

At 1020 hours, sampling of the Wemco discharge line was completed, and everyone traveled to the White Chemical Company location.

At 1030 hours, sampling of a whitish liquid being discharged from the White Chemical Company Laboratory was performed by Joseph Buttich and Stephen Borgianini. A clean 1 liter amber bottle was used to collect a dip sample from the discharge pool, and the dip sample was then poured into four 40 ml vials and four 1 liter amber bottles. The containers were then labeled and sealed. Two 40 ml vials and two 1 liter amber bottles of the whitish liquid were given to Mr. Pytlik, and the other containers were stored in ice. This sample was labeled no. 3.

At 1040 hours, sampling of the White Chemical Company discharge behind the laboratory was completed, and everyone traveled to the recovered oil storage tank TK-1102.

At 1115 hours, sampling of the recovered oil storage tank was conducted by Mr. Borgianini and Mr. Buttich using a brass Kemmerer sampler. The sample was taken at approximately one-half the storage tank's height. The sample was then transferred from the sampler into two clean 1 liter amber bottles. The bottles were labeled, sealed, and allowed to cool. One 1 liter sample (no. 5) of the recovered oil tank's contents was given to Walter Pytlik, and the other one was placed in ice.

At 1120 hours, sampling of the recovered oil storage tank TK-1102 was completed, and everyone traveled to the Plattykill oil-water separator.

At 1200 hours, on the south side of the Plattykill oil-water separator (see attached plot plan), approximately 40 feet from the south bank near the stationary boom, a sludge sample (no. 6) was taken by Stephen Borgianini and Joseph Buttich from the bottom sediment using a Peterson dredge. The sample was transferred into two amber 1 liter containers. The containers were labeled, sealed, and one was given to Mr. Walter Pytlik. The other sample was stored in ice.

At 1315 hours, sampling of the south side of the Plattykill oil-water separator was completed.

At 1220 hours, on the north side of the Plattykill oil-water separator, approximately 40 feet from the north bank (see attached plot diagram) near the stationary boom, a sludge sample (no. 7) was taken from the bottom sediment using a Peterson dredge. The

sample was transferred into two 1 liter amber containers, labeled, and sealed. One sample container was given to Mr. Pytlik, and the other was stored in ice.

At 1220 hours, sampling of the north side of the Plattykill oil-water separator was completed.

At 1240 hours, a sample (no. 8) was taken by Joseph Buttich and Stephen Borgianini from the recovered oil tank TK-3813 (see attached diagram), which had a dome-shaped top. The sample was taken using a bacon bomb sampler, which the subject company supplied. Prior to using the sampler, it was properly cleaned and steamed. The sample was taken at approximately one-half the tank's height, and it was transferred into two amber 1 liter containers. The containers were allowed to cool, and were labeled and sealed. One sample container was given to Mr. Pytlik, and the other was stored in ice.

At 1250 hours, sampling of TK-3813 was completed.

At 1315 hours, a sample (no. 9) was taken by Stephen Borgianini from the second inclined discharge pipe (12" diameter) from the south bank of the Plattykill. The discharge pipe began on the oil-water separator side of the dike and emptied into the Plattykill. Four 40 ml and four 1 liter amber containers were filled directly from the effluent discharge point into the Plattykill. The containers were labeled, sealed, and two 40 ml and two 1 liter amber containers were given to Mr. Pytlik. The other containers were placed in ice.

At 1325 hours, sampling of the Plattykill oil-water separator discharge pipe was completed.

At 1343 hours, sample (no. 10) was taken by Joseph Buttich and Stephen Borgianini from the immediate area around three large transformers (see plot diagram), which appeared to have spilled some of their contents onto the ground. A clean shovel was used to take two composite samples of the contaminated soil from the areas around each of the transformers. The composited soil was then put into two 500 ml clear containers. The containers were labeled and sealed, and one was given to Mr. Ptylik. The other container was placed in ice.

At 1350 hours, sampling of the transformer area had been completed.

At 1400 hours, a sample (no. 11) was taken by Joseph Buttich and Stephen Borgianini from the oil pump's sampling port on storage tank TK-5810. After the sampling port was bled sufficiently, two 1 liter samples were taken directly from the sampling port into two clean 1 liter amber containers. The containers were labeled and sealed, and one was given to Mr. Pytlik. The other container was placed in ice.

At 1410 hours, sampling of storage tank TK-5810 was completed.

At 1420 hours, a sample (no.12) was taken of the blackish free oily substance near the

surface in the northwest corner (see attached plot plan) of the old slop oil lagoon (pit). The sample was taken using one clean container to take a dip sample. The sample was then deposited into two clean 1 liter amber containers. The containers were labeled and sealed, and one sample was given to Mr. Pytlik. The other was placed in ice.

At 1435 hours, a coring sample (no. 13) was taken by Joseph Buttich and Stephen Borgianini at a depth of 3.5 feet at a point approximately 30 feet from the main road and 35 feet from the nearest road perpendicular to the main road (see attached plot plan). A clean soil auger was used to obtain the oily black sludge sample, which was placed in two 1 liter amber containers. The containers were labeled and sealed, and one container was given to Mr. Pytlik. The other container was placed in ice.

At 1450 hours, another coring sample (no. 14) was taken by Joseph Buttich and Stephen Borgianini from the old slop oil lagoon (pit). The sample was taken using a clean auger at a depth of approximately two feet at a point approximately 90 feet from the nearby intersection and 10 feet from the main road (see attached plot diagram). The black oily sludge sample was deposited into two clean 1 liter amber containers. The containers were labeled and sealed, and one container was given to Mr. Pytlik. The other container was placed in ice.

At 1500 hours, sampling of the old slop oil pit was complete.

At 1515 hours, a meeting with Mr. Krauss, Mr. Faille, Mr. Pytlik, and Mr. Santora was held in the main office building to discuss what analyses were to be conducted on the samples taken.

At 1535 hours, Mr. Santora left the meeting.

At 1545 hours, Mr. Santora, Mr. Buttich, and Mr. Borgianini left the Bayonne Industries site.

At 1830 hours, Scott Santora delivered all samples (1 through 14) to James Johnson at the Stablex-Reutter Laboratories in Camden, New Jersey.

B) December 23, 1981
On December 23, 1981, all the results of the fourteen samples taken at the subject company were received by the Division of Hazard Management representatives, and the results are as follows: (See next page.)

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SAMPLE NO. 1 SURFACE SAMPLE FROM OIL-WATER SEPARATOR

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
	Phenanthracene	39 ppm
EPA Priority Pollutants	Methylene chloride	8.5 ppm
	Chloroform	3.9 ppm
	1,2-Dichloroethane	1.2 ppm
	1,2-Dichloropropane	14 ppm
	Benzene	12 ppm
	Tetrachloroethylene	11 ppm
	Chlorobenzene	4.5 ppm
	Antimony	0.36 ppm
	Arsenic	0.5 ppm
	Chromium	8.5 ppm
	Copper	160 ppm
	Lead	46 ppm
	Mercury	0.14 ppm
	Nickel	6.0 ppm
	Zinc	32 ppm
Petroleum Hydrocarbons	$C_{11}HC$	<10 ppm
	$C_{13}HC$	890 ppm
	$C_{15}HC$	440 ppm
	$C_{17}HC$	1300 ppm
	$C_{19}HC$	1100 ppm
	$C_{21}HC$	870 ppm
	$C_{23}HC$	540 ppm
	$C_{25}HC$	700 ppm

SAMPLE NO. 2 OIL SPILL SAMPLE FROM TK-1176

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
EPA Priority Pollutants	Phenanthracene	28 ppm
	Methylene chloride	6.9 ppm
	Chloroform	4.0 ppm
	1,2-Dichloroethane	1.9 ppm
	Benzene	120 ppm
	Tetrachloroethylene	7.7 ppm
	Toluene	100 ppm
	Ethyl Benzene	52 ppm
	Total Xylenes	240 ppm
	Cadmium	3.0 ppm
	Chromium	12 ppm
	Lead	5.5 ppm
	Nickel	17 ppm
	Zinc	6.0 ppm

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SAMPLE NO. 2 (CONTINUED)

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
Petroleum Hydrocarbons	$C_{11}HC$	<10 ppm
	$C_{13}HC$	1000 ppm
	$C_{15}HC$	1200 ppm
	$C_{17}HC$	4100 ppm
	$C_{19}HC$	1600 ppm
	$C_{21}HC$	1800 ppm
	$C_{23}HC$	730 ppm
	$C_{25}HC$	2400 ppm

SAMPLE NO. 3 "WEMCO" DISCHARGE

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
EPA Priority Pollutants	1,1-Dichloroethylene	0.045 ppm
	1,1-Dichloroethane	0.025 ppm
	Chloroform	0.93 ppm
	Trichloroethylene	0.066 ppm
	Toluene	0.09 ppm
	Ethyl Benzene	0.064 ppm
	Total Xylenes	0.3 ppm
	2,4-Dinitro phenol	0.75 ppm
	2,4-Dimethyl phenol	0.25 ppm
	Aldrin	1.2 ppm
	Alpha BHC	2.6 ppm
	Beta BHC	5.3 ppm
	Arsenic	0.014 ppm
	Chromium	0.06 ppm
	Lead	0.11 ppm
	Zinc	0.04 ppm
Hydrocarbons	C_{11} through $C_{25}HC$	<1 ppm

SAMPLE NO. 4 WHITE CHEMICAL COMPANY DISCHARGE BEHIND LABORATORY

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
EPA Priority Pollutants	Toluene	0.07 ppm
	Ethyl Benzene	0.03 ppm
	Total Xylene	0.093 ppm
	Bis(2-Ethylhexyl)phthalate	0.57 ppm
	Antimony	2.6 ppm
	Chromium	0.16 ppm
	Lead	0.10 ppm
	Zinc	0.08 ppm
PolyBrominated Biphenyls	Octabromo biphenyl	<1.0 ppm
	Decabromo biphenyl	<1.0 ppm

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SAMPLE NO. 5 RECOVERED OIL TANK TK-1102

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATIONS
	Phenanthracene	15 ppm
EPA Priority Pollutants	Methylene chloride	9.6 ppm
	Chloroform	4.0 ppm
	1,2-Dichloroethane	1.5 ppm
	Trichloroethylene	3.3 ppm
	Benzene	33 ppm
	Tetrachloroethylene	15 ppm
	Ethyl Benzene	47 ppm
	Total Xylenes	290 ppm
	Chromium	12 ppm
	Copper	16 ppm
	Lead	17 ppm
	Nickel	19 ppm
	Zinc	48 ppm
PolyBrominated Biphenyls	Octabromo biphenyl	<1.0 ppm
	Decabromo biphenyl	<1.0 ppm

SAMPLE NO. 6 PLATTYKILL OIL-WATER SEPARATOR SLUDGE SAMPLE (SOUTH SIDE)

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATIONS
EPA Priority Pollutants	Methylene chloride	8.4 ppm
	Chloroform	3.4 ppm
	1,2-Dichloroethane	1.2 ppm
	Benzene	60 ppm
	Tetrachloroethylene	5.8 ppm
	Chlorobenzene	120 ppm
	Bis(2-Ethylhexyl)phthalate	9.2 ppm
	Phenanthracene	19 ppm
	Arsenic	42 ppm
	Cadmium	1.5 ppm
	Chromium	190 ppm
	Copper	3200 ppm
	Lead	390 ppm
	Mercury	1.3 ppm
	Nickel	48 ppm
	Selenium	0.23 ppm
	Zinc	440 ppm
Petroleum Hydrocarbons	$C_{23}HC$	13 ppm
PolyBrominated Biphenyls	Octabromo biphenyl	<1.0 ppm
	Decabromo biphenyl	<1.0 ppm

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SAMPLE NO. 7 PLATTYKILL OIL-WATER SEPARATOR SLUDGE SAMPLE (NORTH SIDE)

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
EPA Priority Pollutants	Methylene Chloride	6.4 ppm
	Chloroform	4.2 ppm
	1,2-Dichloroethane	1.8 ppm
	Benzene	28 ppm
	Tetrachloroethylene	8.4 ppm
	Chlorobenzene	140 ppm
	Total Xylenes	120 ppm
	Arsenic	20 ppm
	Cadmium	1.5 ppm
	Chromium	170 ppm
	Copper	1800 ppm
	Lead	460 ppm
	Mercury	0.91 ppm
	Nickel	40 ppm
	Zinc	310 ppm
Petroleum Hydrocarbons	$C_{13}HC$	160 ppm
	$C_{17}HC$	560 ppm
	$C_{19}HC$	180 ppm
PolyBrominated Biphenyls	Octabromo biphenyl	< 1.0 ppm
	Decabromo biphenyl	< 1.0 ppm

SAMPLE NO. 8 RECOVERED OIL TANK TK-3818 (DOMED TOP)

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
Volatile Organics and PCB Pesticides	Methylene Chloride	8.4 ppm
	Chloroform	4.0 ppm
	1,2-Dichloroethane	1.5 ppm
	Trichloroethylene	3.8 ppm
	Tetrachloroethylene	16 ppm
	Toluene	70 ppm
	Chlorobenzene	4.5 ppm
	Dieldrin	2.8 ppm
PolyBrominated Biphenyls	Octabromo biphenyl	<1.0 ppm
	Decabromo biphenyl	<1.0 ppm

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SAMPLE NO. 9 12" DIAMETER DISCHARGE LINE FROM PLATTYKILL OIL-WATER SEPARATOR

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
EPA Priority Pollutants	Chloroform	0.70 ppm
	Benzene	0.046 ppm
	Toluene	0.090 ppm
	Ethylbenzene	0.23 ppm
	Total Xylenes	1.6 ppm
	Phenol	2.6 ppm
	Phenanthracene	1.5 ppm
	Aldrin	0.065 ppm
	Gamma BHC	0.063 ppm
	Arsenic	0.003 ppm
	Cadmium	0.03 ppm
	Lead	0.34 ppm
	Mercury	0.018 ppm
	Nickel	0.16 ppm
	Thallium	0.2 ppm
Petroleum Hydrocarbons	C_{11} through C_{25}HC	1.0 ppm
PolyBrominated Biphenyls	Octabromo biphenyl	< 1.0 ppm
	Decabromo biphenyl	< 1.0 ppm

SAMPLE NO. 10 COMPOSITE SAMPLE OF CONTAMINATED SOIL AROUND THREE LARGE TRANSFORMERS

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
EPA Pesticide-PCB Analysis	No PCB's detected	< 3.0 ppm (PCB detection limit in oils)

SAMPLE NO. 11 SAMPLE TAKEN AT SAMPLING PORT ON STORAGE TANK TK-5810

REQUESTED ANALYSES	SUBSTANCES DETECTED	CONCENTRATION
EPA Pesticide-PCB Analysis	No PCB's detected	< 3.0 ppm (PCB detection limit in oils)

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SAMPLE NO. 12 SURFACE OIL SAMPLE IN OLD SLOP OIL LAGOON (PIT)

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATIONS
EPA Priority Pollutants	Methylene chloride	6.7 ppm
	Chloroform	4.0 ppm
	1,2-Dichloroethane	2.2 ppm
	1,1,1-Trichloroethane	8.8 ppm
	Trichloroethylene	4.1 ppm
	Benzene	14 ppm
	Tetrachloroethylene	16 ppm
	Arsenic	0.98 ppm
	Chromium	26 ppm
	Copper	83 ppm
	Lead	140 ppm
	Nickel	19 ppm
	Zinc	31 ppm
Petroleum Hydrocarbons	$C_{11}HC$	240 ppm
	$C_{13}HC$	1200 ppm
	$C_{15}HC$	1700 ppm
	$C_{17}HC$	7000 ppm
	$C_{21}HC$	430 ppm
	$C_{23}HC$	420 ppm
	$C_{25}HC$	1900 ppm
PolyBrominated Biphenyls	Decabromo biphenly	< 1.0 ppm
	Octabromo biphenyl	< 1.0 ppm

SAMPLE NO. 13 FIRST CORING IN OLD SLOP OIL LAGOON (PIT)

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
EPA Priority Pollutants	Methylene chloride	11.0 ppm
	Chloroform	4.4 ppm
	1,2-Dichloroethane	1.5 ppm
	Benzene	14 ppm
	Tetrachloroethylene	8.4 ppm
	Endosulfan I	5.6 ppm
	Arsenic	9.8 ppm
	Cadmium	5.0 ppm
	Chromium	120 ppm
	Copper	110 ppm
	Total Cyanides	3.0 ppm
	Lead	270 ppm
	Mercury	1.0 ppm
	Nickel	49 ppm
	Zinc	240 ppm
Petroleum Hydrocarbons	C_{11} through $C_{25}HC$	1.0 ppm
PolyBrominated Biphenyls	Octabromo biphenyl	< 1.0 ppm
	Decabromo biphenyl	< 1.0 ppm

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SAMPLE NO. 14 SECOND CORING IN THE OLD SLOP OIL LAGOON (PIT)

REQUESTED ANALYSIS	SUBSTANCES DETECTED	CONCENTRATION
EPA Priority Pollutants	Methylene chloride	2.8 ppm
	Benzene	17 ppm
	Tetrachloroethylene	4.4 ppm
	p,p-DDD	1.4 ppm
	Arsenic	8.1 ppm
	Cadmium	6.0 ppm
	Chromium	170 ppm
	Copper	1100 ppm
	Total Cyanides	1.6 ppm
	Lead	480 ppm
	Mercury	0.77 ppm
	Nickel	46 ppm
	Zinc	380 ppm
Petroleum Hydrocarbons	$C_{11}HC$	79 ppm
	$C_{13}HC$	150 ppm
	$C_{15}HC$	320 ppm
	$C_{17}HC$	630 ppm
	$C_{21}HC$	79 ppm
	$C_{25}HC$	200 ppm
PolyBrominated Biphenyls	Octabromo biphenyl	<1.0 ppm
	Decabromo biphenyl	<1.0 ppm

II. CONCLUSIONS:
Based on the previously stated analytical results, the following conclusions are being made:
A) Detectable quantities of hazardous substances other than Petroleum Hydrocarbons have been found in the lined oil-water separator.
B) Detectable quantities of hazardous substances other than Petroleum Hydrocarbons have been found in the no. 6 oil sampled near Tank No. 1176. This suggests that either the Tank No. 1176 was storing contaminated no. 6 oil, or the substances used to clean Tank No. 1176 contained hazardous substances other than Petroleum Hydrocarbons.
C) Detectable quantities of hazardous substances (halogenated organics, etc.) other than petroleum Hydrocarbons were being discharged from the "Wemco" separator.
D) Detectable quantities of hazardous substances were found in the whitish aqueous discharge behind the White Chemical Company building.
E) Detectable quantities of hazardous substances (halogenated organics) other than petroleum Hydrocarbons were found in the sample taken from the recovered oil storage tank (TK-1102).
F) Detectable quantities of hazardous substances (high heavy metals content) other than Petroleum Hydrocarbons were found in the sludge in the Plattykill oil-water separator.
G) Detectable quantities of hazardous substances (halogenated organics) other than Petroleum Hydrocarbons were found in the sample taken from recovered oil tank (TK-3813).

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H) Detectable quantities of hazardous substances, including Petroleum Hydrocarbons were found in the effluent dishcarge from the Plattykill oil-water separator. According to the subject company's N.P.D.E.S. Permit No. 0001341, the subject company is allowed a pH of 6 to 9 and an oil and grease concentration of 10 ppm (average). There is no mention of halogenated organics.
I) No PCB's (< 3 ppm) were detected in the small spills around the three large transformers (see attached plot diagram).
J) No PCB's (< 3 ppm) were detected in the sample taken from product oil tank (TK-5810).
K) Gross quantities of hazardous substances, including Petroleum Hydrocarbons, were detected in the black oily surface sample taken from the old slop oil lagoon (pit).
L) Gross quantities of hazardous substances, including Petroleum Hydrocarbons, were detected in both coring samples taken from the old slop oil lagoon (pit).

III. RECOMMENDATIONS:
Based on the analytical results of the samples taken at the subject facility, the following recommendations are being made:
A) The subject company should not be allowed to cover over the Plattykill oil-water separator without first removing contaminated sludge.
B) The subject company should be requested to remove sludge and soil contaminated with hazardous substances from the old slop oil lagoon (pit).
C) The subject company should be requested to conduct periodic monitoring for full EPA Priority Pollutants and individual Petroleum Hydrocarbons on the effluent discharge from the Plattykill oil-water separator.
D) All storage tanks being used to store for sale or inplant use of Petroleum Hydrocarbons should be sampled and analysed by the subject company for EPA Organic Priority Pollutants.
E) The New Jersey Bureau of Air Pollution Control should be notified that the subject company is using reclaimed oil in its process boilers which contain substances (halogenated organics) other than Petroleum Hydrocarbons.
F) More sampling may be necessary to determine compliance with N.J.D.H.M. codes. This will be dependent upon completion of the full inspection survey of all companies located within the Bayonne Industries, Inc. complex.

Scott A. Santora
Chief, Bureau of Technical Services

Stephen Borgianini
Environmental Specialist
N.J. Division of Hazard Management

Joseph Buttich
N.J. Division of Hazard Management

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April 2, 1996

Mr. Michael Kenney
Office of Site Remediation
Bureau of Case Management
CN 028
Trenton, New Jersey 08625-0028

Re: Platty Kill Canal Phase 2 Sediment Investigation Plan, Bayonne Industries, Inc., Bayonne, New Jersey

Dear Mr. Kenney:

Provided below for your review and comment is a Phase 2 sediment investigation plan for the Platty Kill Canal. This plan was prepared by ENSR Consulting and Engineering (ENSR) on behalf of Bayonne Industries, Inc., and International Matex Tank Terminals (IMTT), the present facility operator, in support of IMTT's proposal for using the canal as a dredge spoils disposal area. The dredge spoils proposed to be deposited in the canal will be from selected shipping berths at the IMTT, Bayonne facility. The plan was developed based on discussions between the New Jersey Department of Environmental Protection (NJDEP) and Dr. Robert Weaver, Corporate Technical Director, Bayonne Industries, and NJDEP's March 27, 1996 comments to the Platty Kill Creek Interim Remedial Action Report, dated November 1995. Included in the plan is the collection and analysis of 48 sediment samples from twelve core locations within the canal. These will include eight locations in the Platty Kill Canal between the sheetpile dam and the bridge at the northern section of the Canal; and, four locations north of the bridge toward the Platty Kill Pond. Each sediment core will be advanced to the depth of the meadow mat (anticipated depth 20 feet). At each sediment core location one composite sediment sample will be collected at each 5 foot depth interval (maximum four samples per sediment core). This sediment investigation, along with results of the initial sediment investigation conducted in the fall of 1994, will provide further delineation of contaminant concentrations in the sediment/sludge layer, and determine the presence or absence of the silty clay layer (commonly referred to as the meadow mat) inside of the sheetpile dam to the south of the bridge, as well as the northern side of the bridge toward the Platty Kill Pond.

BACKGROUND

The Bayonne Industries, Inc. site is a petroleum storage facility which maintains several hundred tanks containing various grades of petroleum products. The site has a 100-year

history as a refinery and bulk storage facility. The Kill Van Kull borders the site on the south, while the Platty Kill Canal partially borders the site on the east. The Platty Kill Pond, which at one time formed the headwaters of the Platty Kill Canal, is a former on-site surface impoundment that received the facility stormwater until May 1978, at which time a wastewater treatment plant started operation at the facility. The Platty Kill Pond is presently separated from the Platty Kill Canal by an earthen dam that has an impermeable liner installed in it. The Platty Kill Pond is currently undergoing a bioremediation treatment process that was initiated in 1990 to reduce the volume of residual petroleum sludge. The Platty Kill Canal is an inactive barge slip that had been maintained in the surrounding filled industrial land site. It is approximately 1000 feet in length and is separated from the Kill Van Kull by a sheetpile dam that was installed in 1991 under permit by the U.S. Corps of Engineers. Based on physical boundaries, the Platty Kill Canal can be partitioned into three separate areas. The first area is the northern section that includes the area from the earthen dam at the Platty Kill Pond, south to the bridge that spans the canal. The second area is the mid-section that includes the area from the bridge, south to the sheetpile dam at the mouth of the canal. The third area includes the section outside of the sheetpile dam.

In the fall of 1994, ENSR conducted a sediment investigation of the Platty Kill Canal as part of an Interim Remedial Action. This investigation included the collection and analysis of sediment samples from 16 locations. These locations included eight locations outside of the sheetpile dam toward the Kill Van Kull; four locations inside of the sheetpile dam between the dam and the bridge; and, four locations north of the bridge toward the Platty Kill Pond.

Analytical results from samples collected from outside the sheetpile dam indicate that the Total Petroleum Hydrocarbons (TPH) concentrations in the upper sediment zone (0 to 4 foot depth interval) are below 1,000 ppm; and the TPH concentrations in the lower sediment zone (below 4 feet) are less than 2,500 ppm. Analytical results from select sediment samples collected from outside of the sheetpile dam and analyzed for Target Compound List (TCL) volatile and semivolatile organic compounds, and Target Analyte List (TAL) inorganics indicate that all compounds detected are below their respective NJDEP impact to groundwater and soil clean-up criteria, but need to be compared to the sediment criteria cited in the NJDEP letter dated March 27, 1996.

Analytical results of a limited number of sediment samples collected from the mid-section of the canal indicate that the TPH concentrations in the upper zone are at, or slightly above 10,000 ppm; and TPH concentrations in the lower zone could exceed 10,000 ppm in the northern reaches of this section near the bridge. Individual organic compound and metals contaminant concentrations in sediment samples collected from this area, in both the upper

and lower sediment zones are below their respective soil clean-up criteria (for those that have established criteria). Analytical results from limited samples collected from the northern section of the canal indicate that the TPH concentrations in both the upper and lower sediment zones exceed the 35,000 ppm NJDEP hazardous waste criteria. Analytical results of individual organic compounds and metals from sediment samples collected from this section of the canal characterize the contaminants to be similar in concentration to those present in the Platty Kill Pond.

IMTT, the current site operator, has an undisputed need to dredge their shipping berths. Since ocean dumping of these dredge spoils is currently banned, IMTT has, for sometime, been exploring potential on-site upland disposal areas for the placement of the dredge spoils; however, it has been concluded that there are no on-site areas suitable as an upland disposal area. IMTT will therefore be proposing to use the Platty Kill Canal as a dredge spoils disposal area. To optimize available space in the canal, this proposal will include dredging of the more highly contaminated sediments in the northern section of the canal to the Platty Kill Pond where the TPH and organic compound concentrations in the sediments will be treated using the existing bioremediation system currently in use in the Platty Kill Pond. IMTT proposes to install new containment on the sides of the canal after the northern portion of the canal has been dredged to the Platty Kill Pond. IMTT proposes to directly overlay the sediments in the mid-section of the canal with the dredge spoils from the shipping berths. Once filled, the dredge spoils area will be seeded.

OBJECTIVES

The objectives of this Phase 2 sediment investigation are to:

- Determine the thickness of the sediment/sludge layer in the Platty Kill Canal inside of the sheetpile dam;
- Determine the presence and depth of the meadow mat within the Platty Kill Canal;
- Provide a further delineation of the contaminated sediment/sludge layer in the canal inside of the sheetpile dam; and,
- Determine the contaminant composition in the sediment/sludge.

This sampling program will provide baseline data detail for IMTT's proposed project to fill the Canal with dredge spoils.

SCOPE OF WORK

ENSR will collect sediment samples from twelve locations inside of the sheetpile dam. At each location, ENSR will advance a sediment core to a depth of the meadow mat or a maximum depth of 20 feet below the top of the sediment layer, whichever is encountered first. For each 20 foot core, ENSR will collect one sediment sample for every five foot depth interval (4 per core). Each sample collected will be analyzed for TPH. At six of the sediment core locations, each of the four sediment samples collected will also be analyzed for TCL, TAL, PCB and pesticide compounds. Provided below is a detailed summary of the proposed sediment investigation.

Sample Locations

Twelve, 20-foot long sediment cores will be collected from the Platty Kill Canal south of the sheetpile dam. Eight sediment cores will be collected from the mid-section of the Platty Kill Canal inside of the sheetpile dam, north of the bridge that spans the canal, and four sediment cores will be collected in the area of the Platty Kill Canal on the northern side of the bridge toward the Platty Kill Pond. Figure 1 provides the proposed sediment core locations. The coordinates of the global position of each sediment core location will be determined and recorded, and each location will be photographed with identifiable surface features in the background.

Sample Collection Methodology

Each of the sediment cores will be collected using a portable vibratory corer mounted on a 22-foot motorized pontoon work platform. A total of twelve sediment cores will be collected. Forty-eight samples (4 per core) plus QA/QC samples will be submitted for laboratory analysis. The following procedure has been designed to ensure that reliable and representative sediment samples are collected for analysis.

Prior to initiating the sampling activity, all work areas (where practical), such as the floor of the work platform and the core extrusion/sampling area, will be covered with plastic sheeting and all sampling equipment (core tubes, etc.) will be steam cleaned. All field team members handling the sediment cores or the sediment corer will be in modified level C protection. A core extrusion/sampling station will be established in a central location onshore. A crane will place the work platform in the desired area (within the canal). Once the work platform has been placed in the water, it will be mobilized to the selected sampling location and the position will be stabilized for coring.

A vibratory corer (OSI Model 1000) fitted with a dedicated aluminum core tube will be lowered into the water until the core sampling tube is located at the water-sediment interface. Once at the interface, the vibratory coring process will commence and will continue until a full 20-foot core length of penetration is achieved, or refusal is reached, which will be assumed to be the meadow mat. Upon completion of the coring, the vibratory corer will be removed from the water and the tube ends will be capped. Due to anticipated hole collapse, it is assumed that subaqueous grouting of the coring hole will not be required. The work platform will then be mobilized to shore and the core tube will be transferred to field personnel at the onshore sample extrusion/sampling station. The core tube will be cut lengthwise into two halves using a hand-held electric clipper. The shallow blade of the clipper permits that only the aluminum core tube is cut, yielding very little disturbance to the sediment core. After opening the core tube the sediment core will be screened with an organic vapor analyzer, the core will be logged and photo-documented, and then sampled.

Four samples will be collected from each sediment core. The samples will be composites for each 5 foot depth interval. The volatile organic fraction from each specified depth interval will be collected first, using a stainless steel trowel. The remainder of the sample from each selected depth interval will be transferred to a decontaminated, stainless steel bowl and homogenized, and then transferred to the appropriate sample jar for the remaining analytical fractions. To prevent cross-contamination, the laboratory cleaned sample containers will remain sealed until the sample has been removed from the corer and homogenized. The sampler will wear a new pair of disposable latex gloves for each sample collected. After a sufficient amount of sample has been placed in the container, the container will be sealed and placed in a cooler to be kept at 4°C until final receipt at the laboratory. This procedure will be repeated for each sediment core location. The sample containers will be labelled in accordance with the procedures specified below. The coolers containing the samples and the chain-of-custodies will shipped from the site daily.

Should it be difficult to contain the sediment in the core tube during the process of cutting the core tube open, the procedure will be modified to cut the core tube in half, forming two ten foot sections. Sediment in each ten foot section would then be extruded into a plastic lined trough or stainless steel bucket, from where the samples will be collected.

Sample Identification

Each sample collected from the canal will have a unique identifying number. Each sample I.D. number will specify the yard the sample was collected in, the sample location, sample type and sample number. For this investigation, the sample number will be continued from

the last sample number used during the fall 1994 investigation. The format for the sample I.D. number is provided below:

Yard - Location - Type - Number - Modifier
Example: Y2 - PKC - SED - 17 - A

Number - Represents the consecutive sample number at that location.
Modifier - Represents sample depth, duplicate, etc.

Chain-of-Custody Procedures

Each sample shipment will be accompanied by a COC record from the time of collection until analysis is performed. The cooler containing the samples will be custody sealed, and the COC will accompany the sample bottles during transportation to the field, sample collection, transportation to the laboratory, and analysis. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents sample custody transfer from the sampler, often through another person, to the Laboratory Sample Custodian.

Minimum information recorded on the chain-of-custody, in addition to the signatures of all custodians and dates of transfer, will include:

- Project identification
- Sampling site location
- Date and time of sample collection
- Sample identification
- Identification of sample collector
- Sample description (type and quantity)
- Analyses to be performed
- Chain-of-custody seal numbers

Each shipping container will be accompanied by the COC record identifying its contents. The back copy(s) of the COC record will be detached and kept with the field notebook for subsequent placement into the ENSR project file following Project Management review; the

original record will accompany the shipment. When under COC, sample bottles should be secured in a locked vehicle or custody sealed in a shuttle when not in the presence of authorized personnel.

Upon sample receipt, the Laboratory Sample Custodian will log the samples in, indicate the condition of each sample as received, and explicitly state whether the COC seal is intact. Any problems or discrepancies will be reported immediately to the Project Manager. COC seal numbers for each sample cooler should be recorded on the COC forms and in the field log book.

The Laboratory Sample Custodian will retain the original of each COC record, with the shipper's airbill or waybill attached. The completed copy of the COC record will be returned to the Project Field Manager.

Analytical Requirements

Table 1 provides the sample identification, analytical requirements and analytical methods for the sediment sampling program. All 48 samples collected will be analyzed for total petroleum hydrocarbons. All samples collected from six of the sediment core locations (four from the mid-section and two from the northern section) will also be analyzed for TCL organics and TAL inorganics. All samples will be submitted for analysis to Industrial Environmental Analysts, Inc. (IEA), Whippany, New Jersey, Certification Number, 14530.

Laboratory Deliverable Requirements

Laboratory deliverables will comply with 10% full laboratory deliverable and 90% reduced laboratory deliverable reporting requirements specified in the NJDEP proposed Technical Requirements for Site Remediation. At a minimum, deliverables will include the following items:

- Cover Page, Format, and Laboratory Certification (Include Cross Reference Table of Field I.D. # and Laboratory I.D. #)
- Chain-of-Custody
- Summary Sheets Listing Analytical Results Including QA Data Information
- Laboratory Chronicle and Methodology Summary Including Sampling Holding Time Check

- Initial Calibration and Continuing Calibration
- Tune Summary (MS)
- Blanks (Method, Field, Trip)
- Surrogate Recovery Summary
- Chromatographs Labelled/Compound Identification
- Non-Conformance Summary

Quality Assurance/Quality Control Samples

Environmental duplicate samples will be collected at a frequency of one per twenty samples. Field blanks will be collected at a frequency of one per day. Each QA/QC sample will be analyzed for the same parameters as the sediment samples. Since no aqueous samples will be collected, no trip blanks will be collected or analyzed. It is anticipated that three environmental duplicate samples and three field blank samples will be collected and analyzed.

Decontamination of Equipment

Following sampling of each core, all sampling equipment to be reused will be decontaminated in accordance with the procedures specified in the NJDEP FSPM. The eight step process is summarized below:

- Laboratory grade glassware detergent plus tap water wash
- Rinse with tap water
- Rinse with distilled/deionized water (ASTM Type II)
- Rinse with 10% nitric acid (metals analysis only)
- Rinse with distilled deionized water
- Rinse with acetone (pesticide grade)
- Air dry
- Rinse with distilled/deionized water

The plastic covering will be replaced for the work surface at the sampling station to avoid possible cross-contamination.

Waste Disposal

The excess sediment not used during sampling will be temporarily placed on plastic sheeting. Following the completion of the sediment sampling program, the sediment will be disposed of directly back into the Platty Kill Canal.

Permits and Notifications

The NJDEP case manager will be notified 48 hours prior to implementing the field activity. It has been determined that no permits are required to perform the sediment sampling activity.

Health and Safety Requirements

The existing remedial investigation Health and Safety Plan (HASP) for the site will be modified to include this sampling activity. The modified HASP will be reviewed by all subcontractors and ENSR personnel prior to implementation of the field activity. It is anticipated that most of the work will be implemented under modified Level C.

SEDIMENT INVESTIGATION REPORT

Following the completion of the sediment analyses and data validation, a letter report will be prepared that will summarize the results of the investigation. All of the geological and analytical data will be evaluated and any relevant relationships and gradients will be determined. It is anticipated that the following items will be included in the report:

- Description logs of each sediment core;
- Cross sections depicting a profile of the surface water, sediment/sludge layer, and geologic horizons;
- Summarized and tabulated analytical results; and,
- Isopleth maps based on the analytical results will be prepared.

Results from this investigation will also be incorporated into the ongoing remedial investigation.

SCHEDULE

Provided below is the anticipated schedule for this sediment investigation.

• Conduct sediment sampling	Five days
• Sediment sample analysis	Four weeks
• Prepare sediment investigation letter report	Four weeks

ENSR anticipates that collection of the sediment samples will be conducted approximately two weeks after NJDEP approval of the sediment investigation plan.

ENSR trusts that this Sediment Investigation Plan meets the approval of the NJDEP. If you have any questions on these plans, please give me a call.

Sincerely yours,

David Grupp
Senior Project Manager

Reference No.: 3782-009(4)/SEDSAMP.PLN

cc: R. Weaver/Bayonne
W. Born/Bayonne
G. Long/ENSR
File: 3782-009-7.3

ENSR

TABLE 1
ANALYTICAL PARAMETERS
PLATTY KILL CANAL PHASE 2 SEDIMENT INVESTIGATION
BAYONNE INDUSTRIES, INC.
BAYONNE, NEW JERSEY

SAMPLE ID NUMBER	ANALYTICAL PARAMETERS
Y9-PKC-SED-17A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-17B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-17C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-17D	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-18A	TPH
Y9-PKC-SED-18B	TPH
Y9-PKC-SED-18C	TPH
Y9-PKC-SED-18D	TPH
Y9-PKC-SED-19A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-19B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-19C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-19D	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-19E (DUP)	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-20A	TPH
Y9-PKC-SED-20B	TPH
Y9-PKC-SED-20C	TPH
Y9-PKC-SED-20D	TPH
Y9-PKC-SED-21A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-21B	TPH, TCL, TAL, PCBs/Pesticides

ENSR

TABLE 1 CONT'D

SAMPLE ID NUMBER	ANALYTICAL PARAMETERS
Y9-PKC-SED-21C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-21D	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-22A	TPH
Y9-PKC-SED-22B	TPH
Y9-PKC-SED-22C	TPH
Y9-PKC-SED-22D	TPH
Y9-PKC-SED-23A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-23B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-23C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-23D	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-24A	TPH
Y9-PKC-SED-24B	TPH
Y9-PKC-SED-24C	TPH
Y9-PKC-SED-24D	TPH
Y9-PKC-SED-24E (DUP)	TPH
Y9-PKC-SED-25A	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-25B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-25C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-25D	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-26A	TPH
Y9-PKC-SED-26B	TPH
Y9-PKC-SED-26C	TPH
Y9-PKC-SED-26D	TPH
Y9-PKC-SED-27A	TPH, TCL, TAL, PCBs/Pesticides

ENSR

TABLE 1 (Cont'd)

SAMPLE ID NUMBER	ANALYTICAL PARAMETERS
Y9-PKC-SED-27B	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-27C	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-27D	TPH, TCL, TAL, PCBs/Pesticides
Y9-PKC-SED-28A	TPH
Y9-PKC-SED-28B	TPH
Y9-PKC-SED-28C	TPH
Y9-PKC-SED-28D	TPH
Y9-PKC-SED-28E (DUP)	TPH

TPH - Total Petroleum Hydrcarbons - EPA Method 418.1 Modified
TCL - Target Compound List Organics - EPA Method 3550/8240/8270
TAL - Target Analyte List Inorganics - EPA Method 3050/6010/7000
PCBs/Pesticides - EPA Method 8080

Reference No.: 3782-009(4)/SEDSAMP.TBL

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Comprehensive Report

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ATTN: **MM**

Report Printed: NOV 14 2006

Overview

BUSINESS SUMMARY

BAYONNE INDUSTRIES INC
321 Saint Charles Ave
New Orleans, LA 70130

D&B D-U-N-S Number: 06-428-8855

This is a **single** location.

Telephone:	504 586-8300
Chief executive:	THOMAS COLEMAN, PRESIDENT
Year started:	1956
Management control:	1983
Employs:	3
History:	CLEAR
SIC:	4226
Line of business:	Bulk liquid storage

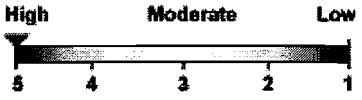
Now Included with this Report NEW!

D&B's Credit Limit Recommendation
How much credit should you extend?
Learn More **View Now**

Payment Trends Profile
Payment trends and industry benchmarks
Jump to Payment Trends

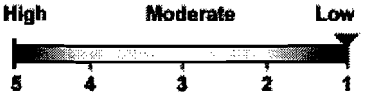
Credit Score Class: 5

High risk of severe payment delinquency over next 12 months



Financial Stress Class: 1

Low risk of severe financial stress over the next 12 months



D&B Rating: --

D&B EXCLUSIVE

EXECUTIVE SUMMARY

The **Financial Stress Class of 1** for this company shows that firms with this classification had a failure rate of 1.2% (120 per 10,000), which is lower than the average of businesses in D&B's database

The **Credit Score class of 5** for this company shows that 61.9% of firms with this classification paid one or more bills severely delinquent, which is 3.08 times higher than the average of businesses in D&B's database.

Predictive Scores	This Business	Comments

Financial Stress Class	1	Failure Rate lower than the average of businesses in D&B's database
Financial Stress Score	1383	Highest Risk: 1,001; Lowest Risk: 1,875
Credit Score Class	5	Probability of Severely Delinquent Payment is higher than the average of businesses in D&B's database
Credit Score	349	Highest Risk: 101; Lowest Risk: 670

Other Key Indicators	
Industry Median	generally within terms
Present management control	23 years
UCC Filings	UCC filing(s) are reported for this business
Public Filings	No record of open Suit(s), Lien(s), or Judgment(s) in the D&B database
History	Is clear
Special Events	Are reported for this business

CREDIT CAPACITY SUMMARY

D&B Rating:--

The blank rating symbol should not be interpreted as indicating that credit should be denied. It simply means that the information available to D&B does not permit us to classify the company within our rating key and that further enquiry should be made before reaching a decision. Some reasons for using a "-" symbol include: deficit net worth, bankruptcy proceedings, insufficient payment information, or incomplete history information. For more information, see the D&B Rating Key.

# of Employees Total: 3

Payment Activity:
(based on 1 experiences)

Average High Credit:	$250
Highest Credit:	$250
Total Highest Credit:	$250

SPECIAL EVENTS

02/06/2006
A premise visit to listed address the week of January 9th, 2006, revealed business to be operational with no visible damage to building.

12/14/2005
An investigation by D&B has determined that this business is in operation.

Jump to:

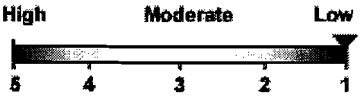
Overview | Payments | Public Filings | History & Operations | Banking & Finance

Scores ☑ D&B Exclusive

FINANCIAL STRESS SUMMARY

The Financial Stress Summary Model predicts the likelihood of a firm ceasing business without paying all creditors in full, or reorganization or obtaining relief from creditors under state/federal law over the next 12 months. Scores were calculated using a statistically valid model derived from D&B's extensive data files.

Financial Stress Class: 1



Low risk of severe financial stress, such as a bankruptcy, over the next 12 months.

Incidence of Financial Stress

Among Businesses with this Class: 1.20% (120 per 10,000)
Average of Businesses in D&B's Database: 2.60% (260 per 10,000)

Financial Stress National Percentile: 54 (Highest Risk: 1; Lowest Risk: 100)

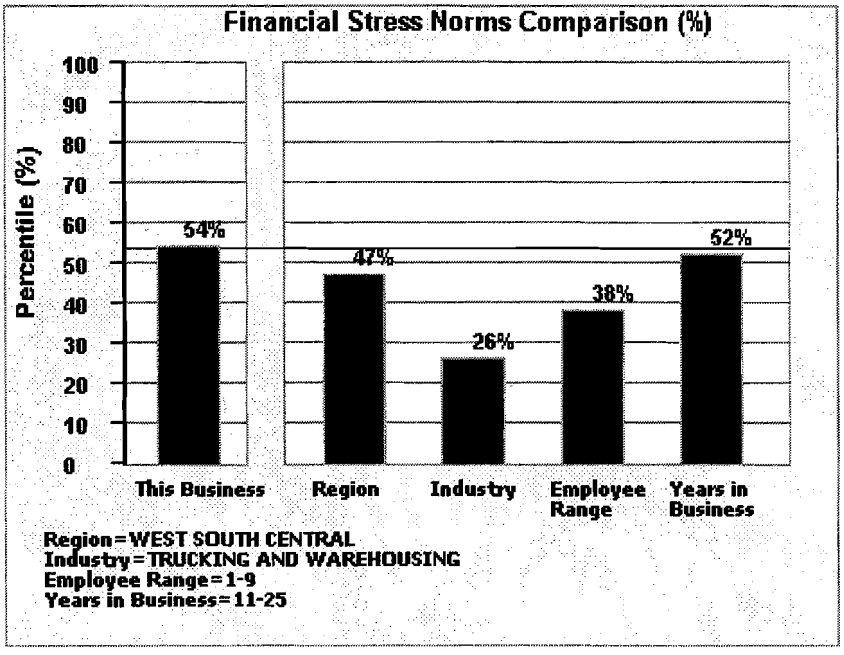
Financial Stress Score: 1383 (Highest Risk: 1,001; Lowest Risk: 1,875)

The Financial Stress Score of this business is based on the following factors:

- 50% of trade dollars indicate slow payment(s) are present.
- Control age or date entered in D&B files indicates lower risk.
- No record of open suit(s), lien(s), or judgment(s) in the D&B files.

Notes:

- The Financial Stress Class indicates that this firm shares some of the same business and financial characteristics of other companies with this classification. It does not mean the firm will necessarily experience financial stress.
- The Incidence of Financial Stress shows the percentage of firms in a given Class that discontinued operations with loss to creditors. The Average Incidence of Financial Stress is based on businesses in D&B's database and is provided for comparative purposes.
- The Financial Stress National Percentile reflects the relative ranking of a company among all scorable companies in D&B's file.
- The Financial Stress Score offers a more precise measure of the level of risk than the Class and Percentile. It is especially helpful to customers using a scorecard approach to determining overall business performance.
- All Financial Stress Class, Percentile, Score and Incidence statistics are based on sample data from 2004.



Norms	National %
This Business	54
Region: **WEST SOUTH CENTRAL**	47
Industry: **TRUCKING AND WAREHOUSING**	26
Employee Range: **1-9**	38
Years in Business: **11-25**	52

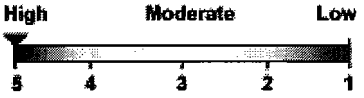
This business has a Financial Stress Percentile that shows:

- Lower risk than other companies in the same region.
- Lower risk than other companies in the same industry.
- Lower risk than other companies in the same employee size range.
- Lower risk than other companies with a comparable number of years in business.

CREDIT SCORE CLASS SUMMARY

The Credit Score Class predicts the likelihood of a firm paying in a severely delinquent manner (90+ Days Past Terms) over the next twelve months. It was calculated using statistically valid models and the most recent payment information in D&B's files.

Credit Score Class: 5



High risk of severe payment delinquency over next 12 months.

Incidence of Delinquent Payment

Among Companies with this Class:	61.90%
Average Compared to Businesses in D&B's Database:	20.10%

Credit Score Percentile: 9 (Highest Risk: 1; Lowest Risk: 100)

Credit Score: 349 (Highest Risk: 101; Lowest Risk: 670)

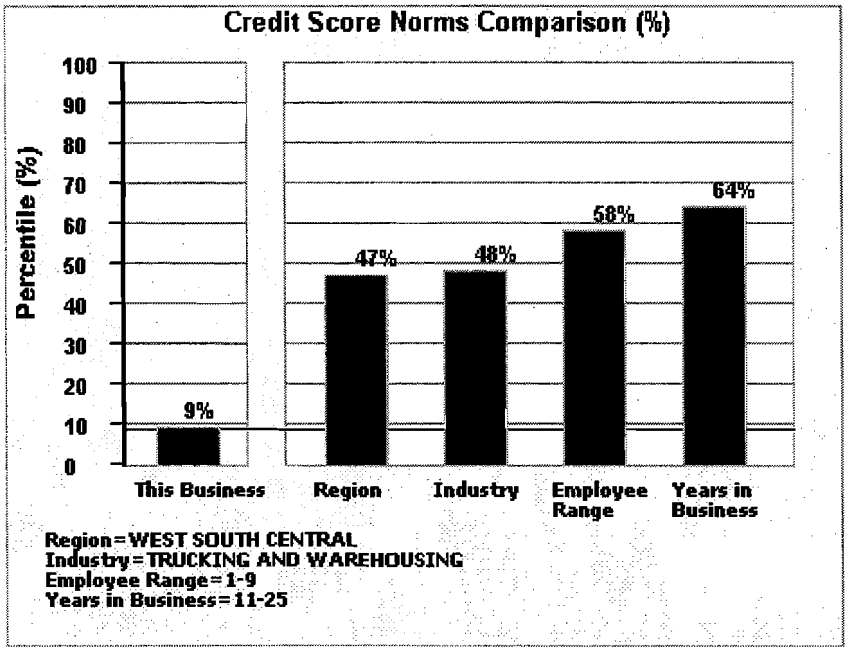
The Credit Score of this business is based on the following factors:

- 50% of trade dollars indicate slow payment(s) are present.
- Payment experiences exist for this firm which are greater than 60 days past due.
- No record of open suit(s), lien(s), or judgment(s) in the D&B files.
- Control age or date entered in D&B files indicates lower risk.

Notes:

- The Credit Score Class indicates that this firm shares some of the same business and payment characteristics of other companies with this classification. It does not mean the firm will necessarily experience delinquency.
- The Incidence of Delinquent Payment is the percentage of companies with this classification that were reported 90 days past due or more by creditors. The calculation of this value is based on an inquiry weighted sample.
- The Percentile ranks this firm relative to other businesses.For example, a firm in the 80th percentile has a lower risk of paying in a severely delinquent manner than 79% of all scorable companies in D&B's files.
- The Credit Score offers a more precise measure of the level of risk than the Class and Percentile. It is especially helpful to customers using a scorecard approach to determining overall business performance.
- All Credit Class, Percentile, Score and Incidence statistics are based on sample data from 2004.

Norms	**National %**
This Business	9
Region: **WEST SOUTH CENTRAL**	47
Industry: **TRUCKING AND WAREHOUSING**	48
Employee Range:	58



1-9	
Years in Business: **11-25**	64

This business has a Credit Score Percentile that shows:

- Higher risk than other companies in the same region.
- Higher risk than other companies in the same industry.
- Higher risk than other companies in the same employee size range.
- Higher risk than other companies with a comparable number of years in business.

Jump to:

Overview | Scores | Public Filings | History & Operations | Banking & Finance

Payments ☑ D&B Exclusive

PAYMENT TRENDS

Total Payment Experiences in D&B's File:	1
Payments Within Terms: (not dollar weighted)	N/A
Total Placed For Collection:	0
Average Highest Credit:	$250
Largest High Credit:	$250
Highest Now Owing:	$0
Highest Past Due:	$0

Current PAYDEX is:		unavailable
Industry Median is:	**80**	equal to generally within terms
Payment Trend currently is:		unavailable

Indications of slowness can be the result of dispute over merchandise, skipped invoices, etc. Accounts are sometimes placed for collection even though the existence or amount of the debt is disputed.

PAYDEX Scores

D&B has not received a sufficient sample of payment experiences to establish a PAYDEX score.

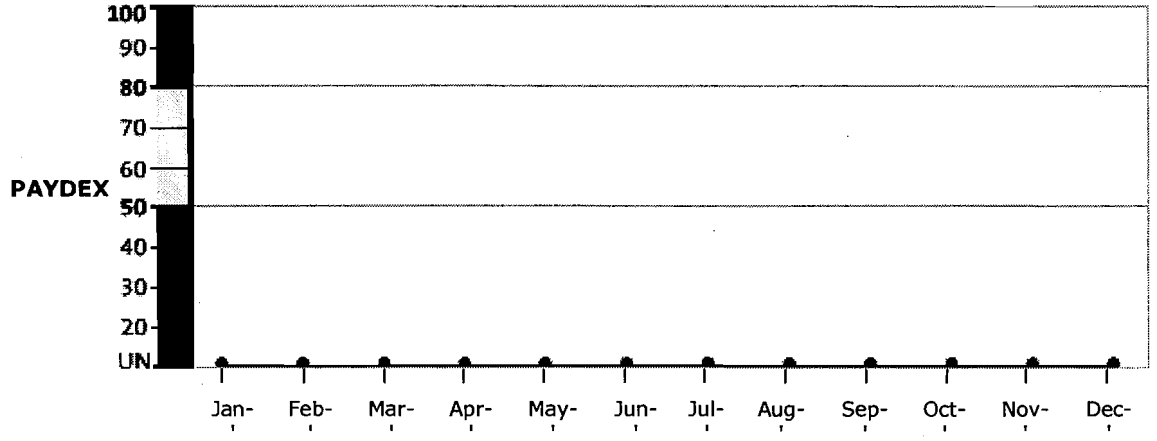
D&B receives nearly 400 million payment experiences each year. We enter these new and updated experiences into D&B Reports as this information is received. At this time, none of those experiences relate to this company.

PAYDEX Yearly Trend

12 Month PAYDEX Scores Comparison to Industry

	1/	2/	3/	4/	5/	6/	7/	8/	9/	10/	11/	12/
This Business	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Industry Quartiles												
Upper			80			80			80			80
Median			80			80			80			80
Lower			74			74			74			73

Shows the trend in D&B PAYDEX scoring over the past 12 months.



Last 12 Months

Based on payments collected over the last 12 months.

- Current PAYDEX for this Business is unavailable.

PAYDEX Comparison to Industry

Shows PAYDEX scores of this Business compared to the Primary Industry from each of the last four quarters. The Primary Industry is Bulk liquid storage, based on SIC code 4226.

Quarterly PAYDEX Scores Comparison to Industry

Previous Year

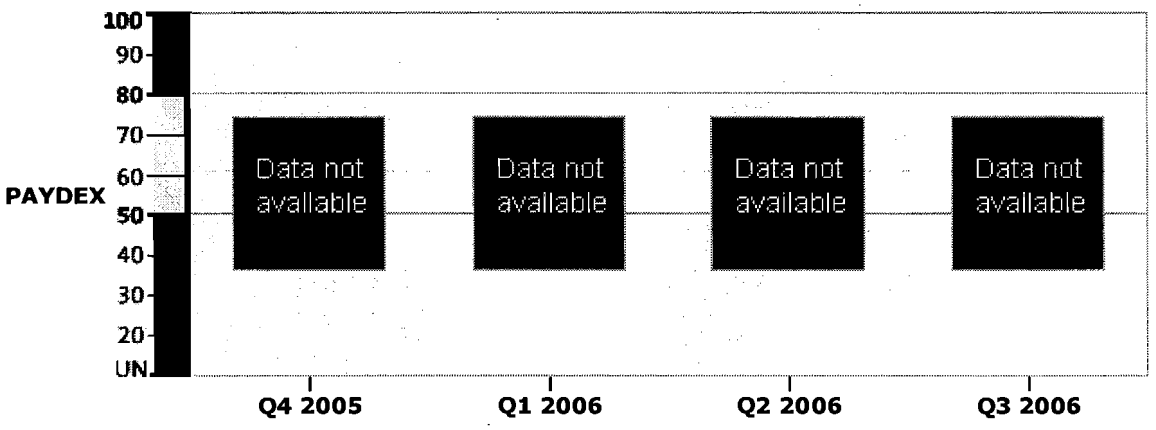
	12/04	3/05	6/05	9/05
This Business	UN	UN	UN	UN

Current Year

	12/05	3/06	6/06	9/06
This Business	UN	UN	UN	UN

Industry Quartiles				
Upper	80	80	80	80
Median	79	79	80	80
Lower	71	70	71	71

Industry Quartiles				
Upper	80	80	80	80
Median	80	80	80	80
Lower	73	74	74	74



Last 12 Months

Based on payments collected over the last 4 quarters.

Score Comparison Key:	▷ This Business	▲ Industry upper quartile
		■ Industry median
		▼ Industry lower quartile

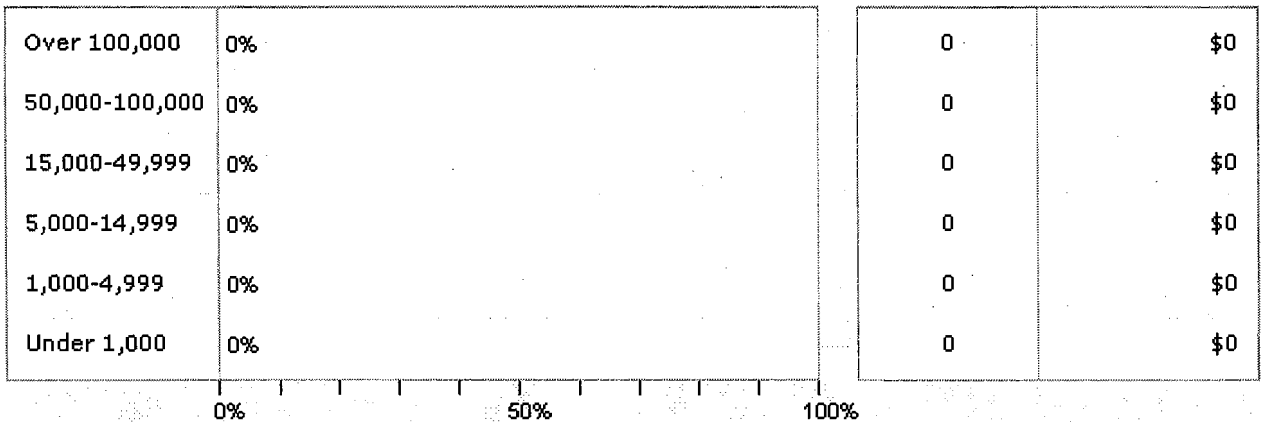
- Current **PAYDEX** for this Business is unavailable
- The present industry **median score** is **80**, or equal to generally within terms.

- Industry upper quartile represents the performance of the payers in the 75th percentile
- Industry lower quartile represents the performance of the payers in the 25th percentile

Payment Habits

For all payment experiences within a given amount of credit extended, shows the percent that this Business paid within terms. Provides number of experiences used to calculate the percentage, and the total dollar value of the credit extended.

$ Credit Extended	**% of Payments Within Terms**	**# Payment Experiences**	**$ Total Dollar Amount**



Based on payments collected over the last 12 months.

Payment experiences reflect how bills are met in relation to the terms granted. In some instances, payment beyond terms can be the result of disputes over merchandise, skipped invoices, etc.

PAYMENT SUMMARY

D&B has not received a sufficient sample of payment experiences to establish a PAYDEX score.

The Payment Summary section reflects payment information in D&B's file as of the date of this report.

There are 1 payment experiences in D&B's file for the most recent 12 months, with 0 experiences reported during the last three month period.

Below is an overview of the company's dollar-weighted payments, segmented by its suppliers' primary industries:

	Total Rcv'd (#)	Total Dollar Amts ($)	Largest High Credit ($)	Within Terms (%)	Days Slow <31 31-60 61-90 90> (%)			
Top industries:								
Misc publishing	1	250	250	50	0	0	50	0
Other payment categories:								
Cash experiences	0	0	0					
Payment record unknown	0	0	0					
Unfavorable comments	0	0	0					
Placed for collections:								
With D&B	0	0	0					
Other	0	N/A	0					
Total in D&B's file	1		250					

The highest **Now Owes** on file is $0 The highest **Past Due** on file is $0

Accounts are sometimes placed for collection even though the existence or amount of the debt is disputed. Indications of slowness can be result of dispute over merchandise, skipped invoices, etc.

PAYMENT DETAILS

Detailed payment history

Date Reported (mm/yy)	Paying Record	High Credit ($)	Now Owes ($)	Past Due ($)	Selling Terms	Last Sale Within (months)
11/05	Ppt-Slow 90	250	0	0		6-12 mos

Each experience shown is from a separate supplier. Updated trade experiences replace those previously reported.

Jump to:

Overview | Scores | Payments | History & Operations | Banking & Finance

Public Filings

PUBLIC FILINGS

The following data includes both open and closed filings found in D&B's database on the subject company.

Record Type	# of Records	Most Recent Filing Date
Bankruptcy Proceedings	0	-
Judgments	0	-
Liens	0	-
Suits	0	-
UCC's	3	01/27/1993

The following Public Filing data is for information purposes only and is not the official record. Certified copies can only be obtained from the official source.

UCC FILINGS

Collateral:	Specified Negotiable instruments
Type:	Original
Sec. party:	NEW JERSEY ECONOMIC DEVELOP AUTH, TRENTON, NJ FIRST NATIONAL BANK OF CHICAGO, THE, HOUSTON, TX
Assignee:	LASALLE NATIONAL BANK NA, CHICAGO, IL
Debtor:	BAYONNE INDUSTRIES INC & IMTT-BAYONNE
Filing number:	1493822
Filed with:	SECRETARY OF STATE/UCC DIVISION, TRENTON, NJ
Date filed:	01/27/1993
Latest Info Received:	03/02/1993

Collateral:	Specified Negotiable instruments
Type:	Original
Sec. party:	NEW JERSEY ECONOMIC DEVELOP AUTH, TRENTON, NJ ABN AMBRO BANK NA, NEW YORK, NY
Assignee:	LASALLE NATIONAL BANK NA, CHICAGO, IL
Debtor:	BAYONNE INDUSTRIES INC & IMTT-BAYONNE
Filing number:	1493820
Filed with:	SECRETARY OF STATE/UCC DIVISION, TRENTON, NJ
Date filed:	01/27/1993
Latest Info Received:	03/02/1993

Collateral:	Specified Negotiable instruments
Type:	Original
Sec. party:	NEW JERSEY ECONOMIC DEVELOP AUTH, TRENTON, NJ RABOBANK NEDERLAND, NEW YORK, NY
Assignee:	LASALLE NATIONAL BANK TRUST NA, CHICAGO, IL
Debtor:	BAYONNE INDUSTRIES INC & IMTT-BAYONNE
Filing number:	1493818
Filed with:	SECRETARY OF STATE/UCC DIVISION, TRENTON, NJ
Date filed:	01/27/1993
Latest Info Received:	03/02/1993

The public record items contained in this report may have been paid, terminated, vacated or released prior to the date this report was printed.

GOVERNMENT ACTIVITY

Activity summary

Borrower (Dir/Guar):	NO
Administrative debt:	NO
Contractor:	NO
Grantee:	NO
Party excluded from federal program(s):	NO

Possible candidate for socio-economic program consideration

Labor surplus area:	N/A
Small Business:	YES (2006)
8(A) firm:	N/A

The details provided in the Government Activity section are as reported to Dun & Bradstreet by the federal government and other sources.

Jump to:

Overview | Scores | Payments | Public Filings | Banking & Finance

History & Operations

HISTORY

The following information was reported **11/21/2005**:

Officer(s): THOMAS COLEMAN, PRESIDENT
RICHARD JURISICH, V PRES
HOWARD STREIFFER, TREAS

DIRECTOR(S): THE OFFICER(S)

Business started 1956 by Pittston Co Inc and Texaco Inc. Present control succeeded 1983. 100% of capital stock is owned by the officers.

THOMAS COLEMAN born 1943. 1965 graduated from Stanford University. 1965 to present active with related interests.

RICHARD JURISICH born 1936. 1959 graduated from Tulane University. 1959 to present active with related interests.

HOWARD STREIFFER born 1943. 1967 graduated from Tulane University. 1972 to present active with related interests.

RELATED INTERESTS:

Van Ommeren, Netherlands, Holland. Started in 1838. Operates as tank storage, shipping and trading service.

Civic Center Site Development Co, Inc, New Orleans, LA. Started in 1958. Operates a hotel.

Downtown Parking Service, New Orleans, LA. Started in 1960. Operates parking lots.

International Properties Inc (IPI), New Orleans, La. Started in 1951. Operates commercial buildings and apartments.

Coleman, Johnson & Artigues, New Orleans, LA. Started in 1946. Operates as a law firm.

International Trading & Transport, New Orleans, LA. Started in 1973. Wholesales petroleum.

International Tank Terminals Ltd, New Orleans, LA. Started in 1946. Wholesales petroleum.

Gravier Properties, New Orleans, LA. Started in 1982. Operates as a construction company.

St Rose Nursery, Inc, New Orleans, LA. Started in 1984. Operates as a plant nursery.

International Trading & Transportation, New Orleans, LA. Started in 1973. Wholesales petroleum.

Splitt, Inc, New Orleans, LA. Started in 1974. Operates as a pipeline company.

International Matex Tank Terminal, New Orleans, LA. Started in 1975. Operates as a bulk storage terminal operator.

Intercompany relations were declined.

Business address has changed from 321 Saint Charles Ave, New Orleans, LA, 70130 to 321 Saint Charles Ave , New Orleans, LA, 70130.

Business address has changed from 321 Saint Charles Ave , New Orleans, LA, 70130 to 321 Saint Charles Ave, New Orleans, LA, 70130.

BUSINESS REGISTRATION

CORPORATE AND BUSINESS REGISTRATIONS PROVIDED BY MANAGEMENT OR OTHER SOURCE

The Corporate Details provided below may have been submitted by the management of the subject business and may not have been verified with the government agency which records such data.

Registered Name: BAYONNE INDUSTRIES INC

Business type: CORPORATION
Corporation type: PROFIT
Date incorporated: JAN 19 1985
State of incorporation: NEW JERSEY
Filing date: JAN 19 1985

Where filed: DEPT OF STATE, TRENTON, NJ

OPERATIONS

11/21/2005

Description: Operates as a bulk liquid storage facility (100%).

Terms are net 30 days. Sells to commercial concerns. Territory : Local.

Nonseasonal.

Employees: 3 which includes officer(s).

Facilities: Operates from premises in building.

SIC & NAICS

SIC:

Based on information in our file, D&B has

NAICS:
493190 Other Warehousing and Storage

assigned this company an extended 8-digit SIC. D&B's use of 8-digit SICs enables us to be more specific to a company's operations than if we use the standard 4-digit code.

The 4-digit SIC numbers link to the description on the Occupational Safety & Health Administration (OSHA) Web site. Links open in a new browser window.

42260100 Liquid storage

Jump to:

Overview | Scores | Payments | Public Filings | History & Operations

Banking & Finance

KEY BUSINESS RATIOS

D&B has been unable to obtain sufficient financial information from this company to calculate business ratios. Our check of additional outside sources also found no information available on its financial performance.
To help you in this instance, ratios for other firms in the same industry are provided below to support your analysis of this business.

Based on this number of establishments: 27

Industry Norms based on 27 establishments

	This Business	Industry Median	Industry Quartile
Profitability			
Return on Sales	UN	6.2	UN
Return on Net Worth	UN	25.7	UN
Short-Term Solvency			
Current Ratio	UN	1.7	UN
Quick Ratio	UN	1.4	UN
Efficiency			
Assets Sales	UN	70.0	UN
Sales / Net Working Capital	UN	8.7	UN
Utilization			
Total Liabs / Net Worth	UN	95.1	UN

UN = Unavailable

FINANCE

11/21/2005

Repeated attempts to contact business were unsuccessful.

CUSTOMER SERVICE

If you have questions about this report, please call our Customer Resource Center at 1.800.234.3867 from anywhere within the U.S. If you are outside the U.S. contact your local D&B office.

*** Additional Decision Support Available ***

Additional D&B products, monitoring services and specialized investigations are available to help you evaluate this company or its industry. Call Dun & Bradstreet's Customer Resource Center at 1.800.234.3867 from anywhere within the U.S. or visit our website at www.dnb.com.

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Bayonne Industries Inc

321 Saint Charles Ave
New Orleans, LA 70130-3145 United States (Map)
Phone: 504-586-8300

LINE OF BUSINESS

BULK LIQUID STORAGE

KEY INFORMATION

D-U-N-S Number	064288855 Buy a D&B credit report.
Company Type	Single Location

KEY NUMBERS

Annual Sales (mil.)	$0.2
Total Employees	3 (est.)
Employees At This Location	3

KEY PERSON

Vice-President; Finance Vice President; Personnel	Richard Jurisich	Network | E-mail

PEOPLE PROFILES PROVIDED BY BAYONNE INDUSTRIES INC EMPLOYEES

There are currently no people listed with this company. Be the first:

Add yourself to this company record

INDUSTRY INFORMATION

First Research Industry Profiles

Warehousing and Storage **(primary)**

Hoover's Industries

Transportation Services
- Logistics Services
  - Warehousing & Distribution Services **(primary)**

Primary SIC Code

4226: Special warehousing and storage, nec

Primary NAICS Code

493190: Other Warehousing and Storage

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CCB000004

New Jersey State Business Gateway Service
Corporate and Business Information Reporting

Business Entity Status Report

Printing Instructions: Open your Browser's Page Setup menu and set your page margins to 0.25". Use your Browser's Print option to print the report as seen on screen.

Saving Instructions: Save this file to your hard drive for later viewing by using the Browser's "Save As" function.

All available information is displayed.

Status Report For: BAYONNE INDUSTRIES, INC.

Business Name: BAYONNE INDUSTRIES, INC.
Report Date: 02/18/2009
Business ID Number: 1895325000
Transaction Number: Sequence: 1443664: 1

Business Type: DOMESTIC PROFIT CORPORATION
Status: ACTIVE

Filing Date: 01/11/1956
Home Jurisdiction: NJ
Status Change Date:
Stock Amount: 99999999999
DOR Suspension Start Date:
DOR Suspension End Date:
Tax Suspension Start Date:
Tax Suspension End Date:
Annual Report Month: 1
Last Annual Report Filed: 01/22/2009
For Last Annual Report Paid Year: 2009

Incorporator: X
Agent: RICHARD R FISETTE
Agent Address: 250 E 22ND STREET
BAYONNE, NJ 07002 - 0000
Office Address Status: Deliverable
Main Business Address: 321 ST CHARLES AVE 10TH FLOOR
NEW ORLEANS, LA 70130
Principal Business Address: FOOTOF EAST 22ND STREET
BAYONNE, NJ 07002

Associated Names

Name:	Type Description:

Officers/Directors/Members

1) **Title:** CHIEF EXEC. OFFICER (CEO)
Name: THOMAS COLEMAN

CCB000006

	Address:	**1145 FOURTH STREET** **HARVEY, LA 70058**
2)	**Title:**	**OTHER**
	Name:	**JAMES COLEMAN, JR**
	Address:	**1145 FOURTH STREET** **HARVEY, LA 70058**
3)	**Title:**	**SECRETARY**
	Name:	**CHARLES JOHNSON**
	Address:	**1145 FOURTH STREET** **HARVEY, LA 70058**

Exit Return to Main List Next >

**If you would like to receive photocopies of documents filed by this business entity, mail your request to PO Box 450, Trenton, NJ 08625. Indicate the Business Entity Number(s) involved and the type of document you wish to have copies of. Your choices are listed below:

CHARTER DOCUMENTS
Original Certificate Only (For example, Certificate of Incorporation);
Changes and Amendments to the Original Certificate Only; **OR**
All Charter Documents (Original Certificate and Changes/Amendments)
And/or
ANNUAL REPORTS
Copy of Latest Annual Report; **OR**
Copy of Annual Report for a Specific Year(s) (List the Year Desired)

The photocopy fee for all entities except limited liability companies is $1 per page. For limited liability companies, the fee is $10 for the first page and $2 per page thereafter.

The total fee amount for your order will vary depending on the number of pages associated with each filed document you request. You may supply us with a check with a NOT TO EXCEED instruction to cover the costs. Make the check payable to the Treasurer, State of New Jersey. Alternately, you may pay by credit card (provide card#/expiration date and cardholder information) or depository account. Please include a self-addressed envelope with your order. If you have any questions or would like information on alternative service options such as over-the-counter expedited service, call 609-292-9292 (option 3 on the main menu and then option 8), weekdays, 8:30 a.m. to 4:30 p.m.

Privacy Policy

Louisiana Secretary of State

COMMERCIAL DIVISION

Corporations Database

Louisiana Secretary of State
Detailed Record

Charter/Organization ID: 34130113D

Name: INTERNATIONAL TANK BAYONNE, INC.

Type Entity: Business Corporation

Status: Active

Annual Report Status: In Good Standing **Add Certificate of Good Standing to Shopping Cart**

Last Report Filed on 12/30/2008

Mailing Address: C/O C. B. JOHNSON, 321 ST. CHARLES AVE., 10TH FL., NEW ORLEANS, LA 70130

Domicile Address: 1145 FOURTH STREET, HARVEY, LA 70058

File Date: 12/12/1983

Registered Agent (Appointed 11/28/2006): DARRYL DAIGS, 1145 FOURTH STREET, HARVEY, LA 70058

President: JAMES O. COLEMAN, 1145 FOURTH STREET, HARVEY, LA 70058

Secretary: C. B. JOHNSON, 1145 FOURTH STREET, HARVEY, LA 70058

Director: THOMAS B. COLEMAN, 1145 FOURTH STREET, HARVEY, LA 70058

Amendments on File
MERGER (09/24/2007)
MERGER (09/24/2007)
DOMICLE, AGENT CHG OR RESIGN OF AGT (01/31/1983)

New Search | View Cart

CCB000007

New Jersey State Business Gateway Service

Corporate and Business Information Reporting

Business Entity Status Report

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Saving Instructions: Save this file to your hard drive for later viewing by using the Browser's "Save As" function.

All available information is displayed.

Status Report For: INTERNATIONAL TANK BAYONNE, INC.

Business Name:	**INTERNATIONAL TANK BAYONNE, INC.**	**Report Date:**	**02/18/2009**
Business ID Number:	**0100243322**	**Transaction Number: Sequence:**	**1443664: 2**

Business Type:	**FOREIGN PROFIT CORPORATION**
Status:	**ACTIVE**

Filing Date:	**11/29/1984**	**Home Jurisdiction:**	**LA**
Status Change Date:		**Stock Amount:**	**0**
DOR Suspension Start Date:		**DOR Suspension End Date:**	
Tax Suspension Start Date:		**Tax Suspension End Date:**	

Annual Report Month:	**11**
Last Annual Report Filed:	**01/22/2009**
For Last Annual Report Paid Year:	**2008**

Incorporator:	
Agent:	**RICHARD R FISETTE**
Agent Address:	**250 E 22ND STREET**
	BAYONNE, NJ 07002 - 0000
Office Address Status:	**Deliverable**
Main Business Address:	**250 E 22ND ST**
	BAYONNE, NJ 07002
Principal Business Address:	**250 E 22ND ST**
	BAYONNE, NJ 07002

Associated Names

Name:	**Type Description:**

Officers/Directors/Members

1) **Title:** **CHIEF EXEC. OFFICER (CEO)**
Name: **THOMAS COLEMAN**

CCB000008

Address: **1145 FOURTH STREET**
HARVEY, LA 70058

2) **Title:** **OTHER**
Name: **JAMES COLEMAN, JR.**
Address: **1145 FOURTH STREET**
HARVEY, LA 70058

3) **Title:** **SECRETARY**
Name: **CHARLES JOHNSON**
Address: **1145 FOURTH STREET**
HARVEY, LA 70058

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Original Certificate Only (For example, Certificate of Incorporation);
Changes and Amendments to the Original Certificate Only; **OR**
All Charter Documents (Original Certificate and Changes/Amendments)
And/or
ANNUAL REPORTS
Copy of Latest Annual Report; **OR**
Copy of Annual Report for a Specific Year(s) (List the Year Desired)

The photocopy fee for all entities except limited liability companies is $1 per page. For limited liability companies, the fee is $10 for the first page and $2 per page thereafter.

The total fee amount for your order will vary depending on the number of pages associated with each filed document you request. You may supply us with a check with a NOT TO EXCEED instruction to cover the costs. Make the check payable to the Treasurer, State of New Jersey. Alternately, you may pay by credit card (provide card#/expiration date and cardholder information) or depository account. Please include a self-addressed envelope with your order. If you have any questions or would like information on alternative service options such as over-the-counter expedited service, call 609-292-9292 (option 3 on the main menu and then option 8), weekdays, 8:30 a.m. to 4:30 p.m.

Privacy Policy

Louisiana Secretary of State

COMMERCIAL DIVISION
Corporations Database

Louisiana Secretary of State
Detailed Record

Charter/Organization ID: 34845507D

Name: ITT-STORAGE, INC.

Type Entity: Business Corporation

Status: Active

Annual Report Status: In Good Standing **Add Certificate of Good Standing to Shopping Cart**

Last Report Filed on 09/29/2008

Mailing Address: C/O CHARLES B. JOHNSON, 321 ST. CHARLES AVE., 10TH FL. STE., NEW ORLEANS, LA 70130

Domicile Address: 1145 FOURTH ST., HARVEY, LA 70058

File Date: 10/05/1999

Registered Agent (Appointed 10/05/2006): DARRYL DAIGS, 1145 4TH ST., HARVEY, LA 70058

Director: JAMES J. COLEMAN, JR., 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Director: THOMAS B. COLEMAN, 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Director: JAMES J. COLEMAN, SR., 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

New Search View Cart

CCB000009

Louisiana Secretary of State

COMMERCIAL DIVISION

Corporations Database

Louisiana Secretary of State
Detailed Record

Charter/Organization ID: 35019666K

Name: INTERNATIONAL TANK TERMINALS, L.L.C.

Prior Name: ITT-JEFFERSON, L.L.C. (12/28/2000)

Type Entity: Limited Liability Company

Status: Active

Annual Report Status: In Good Standing · **Add Certificate of Good Standing to Shopping Cart**

Last Report Filed on 12/30/2008

Mailing Address: C/O CHARLES B. JOHNSON, 321 ST. CHARLES AVE., 10TH FLOOR SUITE, NEW ORLEANS, LA 70130

Domicile Address: 1145 FOURTH STREET, HARVEY, LA 70058

File Date: 12/22/2000

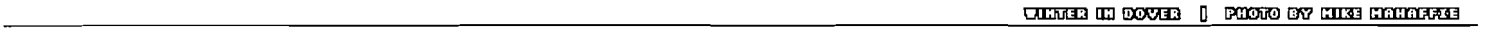
Registered Agent (Appointed 12/14/2006): DARRYL DAIGS, 1145 FOURTH STREET, HARVEY, LA 70058

Member: LOVING ENTERPRISES, INC., 1145 FOURTH STREET, HARVEY, LA 70058

Amendments on File
NAME CHANGE (12/28/2000)
MERGER (12/28/2000)

New Search | View Cart

CCB000010



Department of State: Division of Corporations

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Entity Details

THIS IS NOT A STATEMENT OF GOOD STANDING

File Number:	**4144017**	Incorporation Date / Formation Date:	**04/18/2006** (mm/dd/yyyy)
Entity Name:	**IMTT HOLDINGS INC.**		
Entity Kind:	**CORPORATION**	Entity Type:	**GENERAL**
Residency:	**DOMESTIC**	State:	**DE**

REGISTERED AGENT INFORMATION

Name:	**DELAWARE CORPORATION ORGANIZERS, INC.**		
Address:	**1201 NORTH MARKET ST. P.O. BOX 1347**		
City:	**WILMINGTON**	County:	**NEW CASTLE**
State:	**DE**	Postal Code:	**19801**
Phone:	**(302)658-9200**		

Additional Information is available for a fee. You can retrieve Status for a fee of $10.00 or more detailed information including current franchise tax assessment, current filing history and more for a fee of $20.00.

Would you like ○Status ○Status,Tax & History Information Submit

Back to Entity Search

To contact a Delaware Online Agent click here.

CCB000011

Louisiana Secretary of State

COMMERCIAL DIVISION

Corporations Database

Louisiana Secretary of State
Detailed Record

Charter/Organization ID: 36180618F

Name: IMTT HOLDINGS INC.

Type Entity: Business Corporation (Non-Louisiana)

Status: Active

Annual Report Status: In Good Standing **Add Certificate of Good Standing to Shopping Cart**

Last Report Filed on 04/07/2008

Mailing Address: C/O CHARLES B. JOHNSON, 1145 FOURTH ST., HARVEY, LA 70058

Domicile Address: 201 N. MARKET ST., WILMINGTON, DE 19801

Principal Office: 1145 FOURTH ST., HARVEY, LA 70058

Principal Bus. Est. in Louisiana: 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Qualified: 05/09/2006

Registered Agent (Appointed 5/09/2006): DARRYL DAIGS, 1145 FOURTH ST., HARVEY, LA 70058

President: THOMAS B. COLEMAN, 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Director: THOMAS B. COLEMAN, 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Secretary/Treasurer: CHARLES B. JOHNSON, 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Officer: JAMES J. COLEMAN, JR., 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Director: JAMES J. COLEMAN, JR., 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

New Search | View Cart

CCB000012

Louisiana Secretary of State

COMMERCIAL DIVISION

Corporations Database

Louisiana Secretary of State
Detailed Record

Charter/Organization ID: 34845506D

Name: ITT-BT PARTNER, INC.

Merger or Conversion Information: MERGED INTO INTERNATIONAL TANK BAYONNE, INC. DOMICILED AT HARVEY, LOUISIANA ON SEPTEMBER 24, 2007 WITH AN EFFECTIVE DATE OF OCTOBER 02, 2007.

Type Entity: Business Corporation

Status: Not Active (Voluntary action)

Last Report Filed on 09/21/2007

Mailing Address: C/O CHARLES B. JOHNSON, 321 ST. CHARLES AVE., 10TH FL. STE, NEW ORLEANS, LA 70130

Domicile Address: 1145 FOURTH ST, HARVEY, LA 70058

File Date: 10/05/1999

Registered Agent (Appointed 10/05/2006): DARRYL DAIGS, 1145 4TH ST., HARVEY, LA 70058

Director: JAMES J. COLEMAN, JR., 321 ST. CHARLES AVE, NEW ORLEANS, LA 70130

Director: THOMAS B. COLEMAN, 321 ST. CHARLES AVE, NEW ORLEANS, LA 70130

Director: JAMES J. COLEMAN, SR., 321 ST. CHARLES AVE, NEW ORLEANS, LA 70130

Amendments on File
MERGER (09/24/2007)

New Search | View Cart

CCB000013

Louisiana Secretary of State

COMMERCIAL DIVISION

Corporations Database

Louisiana Secretary of State
Detailed Record

Charter/Organization ID: 31700650D

Name: BAYON OF LA., INC.

Merger or Conversion Information: MERGED INTO INTERNATIONAL TANK BAYONNE, INC. DOMICILED AT HARVEY, LOUISIANA ON SEPTEMBER 24, 2007 WITH AN EFFECTIVE DATE OF OCTOBER 02, 2007.

Prior Name: INTERNATIONAL TRADING TRANSACTIONS, INC. (9/21/1983)

Type Entity: Business Corporation

Status: Not Active (Voluntary action)

Last Report Filed on 03/01/2007

Mailing Address: C/O CHARLES B. JOHNSON, 321 ST. CHARLES AVENUE, 10TH FLOOR, NEW ORLEANS, LA 70130

Domicile Address: 1145 FOURTH STREET, HARVEY, LA 70058

File Date: 01/03/1977

Registered Agent (Appointed 5/04/2006): DARRYL DAIGS, 1145 FOURTH STREET, HARVEY, LA 70058

Director: THOMAS B. COLEMAN, 1145 FOURTH STREET, HARVEY, LA 70058

Secretary: CHARLES B. JOHNSON, 1145 FOURTH STREET, HARVEY, LA 70058

Director: JAMES J. COLEMAN, JR., 1145 FOURTH STREET, HARVEY, LA 70058

Amendments on File
MERGER (09/24/2007)
MERGER (07/14/2000)
NAME CHANGE (09/21/1983)

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CCB000014

Louisiana Secretary of State

COMMERCIAL DIVISION

Corporations Database

Louisiana Secretary of State
Detailed Record

Charter/Organization ID: 34126033L

Name: BAYONNE TERMINAL PARTNERSHIP

Merger or Conversion Information: MERGED INTO IMTT-BAYONNE A DELAWARE PARTNERSHIP ON OCTOBER 5 2007 AND FILED IN DELAWARE ON SEPTEMBER 28, 2007

Prior Name: BT (10/05/2007)

Type Entity: Partnership (Non-Louisiana)

Status: Not Active (Voluntary action)

Last Report Filed on 09/21/2007

Mailing Address: C/O C. B. JOHNSON, 321 ST. CHARLES AVE., 10TH FLOOR SUITE, NEW ORLEANS, LA 70130

Domicile Address: DOMICILE: DELAWARE

Principal Office: FOOT OF EAST 22ND STREET, BAYONNE, NJ 07002

Principal Bus. Est. in Louisiana: 321 ST. CHARLES AVENUE, NEW ORLEANS, LA 70130

Registered: 10/17/1983

Registered Agent (Appointed 11/27/2006): DARRYL DAIGS, 1145 4TH ST., HARVEY, LA 70058

General Partner: BAYON OF LA., INC., 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Amendments on File
NAME CHANGE (10/05/2007)
MERGER (10/05/2007)
STMT OF CHG OR CHG PRIN BUS OFF (FOREIGN (04/15/1999)

New Search | View Cart

CCB000015

Louisiana Secretary of State

COMMERCIAL DIVISION
Corporations Database

Louisiana Secretary of State
Detailed Record

Charter/Organization ID: 34845528D

Name: ITT-BAYONNE STORAGE, INC.

Type Entity: Business Corporation

Status: Active

Annual Report Status: In Good Standing **Add Certificate of Good Standing to Shopping Cart**

Last Report Filed on 09/29/2008

Mailing Address: C/O CHARLES B. JOHNSON, 321 ST. CHARLES AVE., 10TH FL. STE., NEW ORLEANS, LA 70130

Domicile Address: 1145 FOURTH ST., HARVEY, LA 70058

File Date: 10/05/1999

Registered Agent (Appointed 10/05/2006): DARRYL DAIGS, 1145 FOURTH ST., HARVEY, LA 70058

Director: JAMES J. COLEMAN, JR., 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Director: THOMAS B. COLEMAN, 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Director: JAMES J. COLEMAN, SR., 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

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CCB000016

WINTER IN DOVER | PHOTO BY MIKE MAHAFFIE

Department of State: Division of Corporations

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Entity Details

File Number:	**3332942**	Incorporation Date / Formation Date:	**12/20/2000** (mm/dd/yyyy)
Entity Name:	**INTERNATIONAL-MATEX TANK TERMINALS**		
Entity Kind:	**GENERAL PARTNERSHIP (GP)**	Entity Type:	**GENERAL PARTNERSHIP**
Residency:	**DOMESTIC**	State:	**DE**
Status:	**GOOD STANDING**	Status Date:	**06/01/2007**

REGISTERED AGENT INFORMATION

Name:	**DELAWARE CORPORATION ORGANIZERS, INC.**		
Address:	**1201 NORTH MARKET ST. P.O. BOX 1347**		
City:	**WILMINGTON**	County:	**NEW CASTLE**
State:	**DE**	Postal Code:	**19801**
Phone:	**(302)658-9200**		

Additional Information is available for a fee of $20.00. This information will include current franchise tax assessment, current filing history and more..

Would you like ○Tax & History Information Submit

Back to Entity Search

To contact a Delaware Online Agent click here.

CCB000017

Louisiana Secretary of State

COMMERCIAL DIVISION
Corporations Database

Louisiana Secretary of State
Detailed Record

Charter/Organization ID: 08107340L

Name: INTERNATIONAL-MATEX TANK TERMINALS

Type Entity: Partnership (Non-Louisiana)

Status: Active

Last Report Filed on 03/10/2008

Mailing Address: C/O C. B. JOHNSON, 321 ST. CHARLES AVENUE, 10TH FLOOR SUITE, NEW ORLEANS, LA 70130

Domicile Address: DOMICILE: DELAWARE

Principal Office: 321 ST. CHARLES AVENUE, 10TH FLOOR SUITE, NEW ORLEANS, LA 70130

Principal Bus. Est. in Louisiana: 1145 FOURTH ST., HARVEY, LA 70058

Registered: 04/08/1981

Registered Agent (Appointed 5/04/2006): DARRYL DAIGS, 1145 FOURTH ST., HARVEY, LA 70058

General Partner: INTERNATIONAL TANK TERMINALS, LTD., 1145 FOURTH ST., HARVEY, LA 70058

Amendments on File
STMT OF CHG OR CHG PRIN BUS OFF (FOREIGN (04/15/1999)
AMENDMENT (09/17/1992)
RESTATED ARTICLES (05/23/1986)

New Search | View Cart

CCB000018

Louisiana Secretary of State

COMMERCIAL DIVISION

Corporations Database

Louisiana Secretary of State
Detailed Record

Charter/Organization ID: 19001030F

Name: INTERNATIONAL TANK TERMINALS, LTD.

Merger or Conversion Information: MERGED INTO INTERNATIONAL TANK TERMINALS, L.L.C. DOMICILED AT HARVEY, LOUISIANA ON DECEMBER 28, 2000 WITH AN EFFECTIVE DATE OF DECEMBER 27, 2000

Prior Name: AMERICAN LIBERTY TANK TERMINALS, LTD. (11/07/1967)

Prior Name: AMERICAN LIBERTY MARKETING COMPANY (3/18/1959)

Prior Name: AMERICAN LIBERTY PETROLEUM COMPANY (1/26/1948)

Prior Name: SOUTHPORT PRODUCTION COMPANY (1/26/1948)

Type Entity: Business Corporation (Non-Louisiana)

Status: Not Active (Voluntary action)

Last Report Filed on 03/13/2000

Mailing Address: C/O BERTRAND F. ARTIGUES, 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Domicile Address: CORNER OF FEDERAL & LOOCKERMAN, DOVER, DE 19901

Principal Office: 1145 FOURTH ST., HARVEY, LA 70058

Principal Bus. Est. in Louisiana: 1145 FOURTH ST., HARVEY, LA 70058

Qualified: 04/26/1945

Registered Agent (Appointed 3/10/1997): RICHARD B. JURISICH, SR., 1145 FOURTH ST., HARVEY, LA 70058

Registered Agent (Appointed 8/30/1994): BROOK DEBUYS, 1145 FOURTH ST., HARVEY, LA 70058

President: THOMAS B. COLEMAN, 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Vice President: HOWARD W. STREIFFER, 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

Secretary: BERTRAND F. ARTIGUES, 321 ST. CHARLES AVE., NEW ORLEANS, LA 70130

CCB000019

Amendments on File
MERGER (12/28/2000)
MERGER (12/21/1982)
NAME CHANGE (11/07/1967)
NAME CHANGE (03/18/1959)
NAME CHANGE (01/26/1948)
NAME CHANGE (01/26/1948)

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Due to planned maintenance, online purchasing will be unavailable Wednesday, February 18th, from 8:30PM - 9:30PM EST. Thank you for your patience as we continue to improve our infrastructure to better serve you.

International-Matex Tank Terminals

250 E 22nd St
Bayonne, NJ 07002-5052 United States (Map)

Phone: 201-437-2200

LINE OF BUSINESS

TANK TERMINAL/TANK RENTAL

KEY INFORMATION

D-U-N-S Number	154325815 Buy a D&B credit report.
Doing Business As	"Imtt-Bayonne"
Company Type	Branch

KEY NUMBERS

Employees At This Location	120

KEY PERSON

Comptroller; Manager	Wendell Born	Network | E-mail

PEOPLE PROFILES PROVIDED BY INTERNATIONAL-MATEX TANK TERMINALS EMPLOYEES

There are currently no people listed with this company. Be the first:

Add yourself to this company record

INDUSTRY INFORMATION

First Research Industry Profiles

Hoover's Industries

Energy & Utilities
Oil & Gas Refining, Marketing & Distribution
Petroleum Bulk Stations & Terminals **(primary)**

Primary SIC Code

4226: Special warehousing and storage, nec

Primary NAICS Code

493190: Other Warehousing and Storage

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CCB000020

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ATTN: **TSI NB 001 111**

Report Printed: FEB 17 2009
In Date

BUSINESS SUMMARY

INTERNATIONAL-MATEX TANK TERMINALS
IMTT
321 St Charles Ave
Second Floor
New Orleans, LA 70130

Now Included with this Report NEW!

D&B's Credit Limit Recommendation
D&B's industry and risk-based limit guidance
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Payment Trends Profile
Payment trends and industry benchmarks
Learn More View Now

Do not confuse with international tank terminals ltd.
This is a **headquarters** location.
Branch(es) or division(s) exist.

Web site:	www.imtt.com
Telephone:	504 586-8300
Fax:	504 525-9537
Manager:	THOMAS B COLEMAN, PTNR
Year started:	1975
Employs:	1,000 (70 here)
Sales E:	$200,000,000
History:	CLEAR
Financing:	SECURED
SIC:	4226
Line of business:	Special warehouse/storage

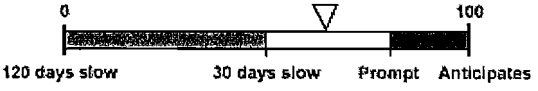
D-U-N-S Number: 01-038-5979

D&B Rating: **1R3**
Number of employees: 1R is **10 or more** employees.

Composite credit appraisal: 3 is **fair**.

D&B PAYDEX®:

12-Month D&B PAYDEX: 67
When weighted by dollar amount, payments to suppliers average 18 days beyond terms.



Based on trade collected over last 12 months.

NEW! Enhanced payment trends and industry benchmarks are available on this business

SPECIAL EVENTS

10/27/2008
2008 HURRICANE GUSTAV: This business is located in a FEMA Individual Assistance designated disaster area and may have been impacted by the effects of this hurricane.

SUMMARY ANALYSIS

D&B Rating: **1R3**
Number of employees: 1R indicates **10 or more** employees.

CCB000021

Composite credit appraisal: 3 is **fair**.

The 1R and 2R ratings categories reflect company size based on the total number of employees for the business. They are assigned to business files that do not contain a current financial statement. In 1R and 2R Ratings, the 2, 3, or 4 creditworthiness indicator is based on analysis by D&B of public filings, trade payments, business age and other important factors. 2 is the highest Composite Credit Appraisal a company not supplying D&B with current financial information can receive. For more information, see the D&B Rating Key.

Below is an overview of the company's rating history since 01/01/91:

D&B Rating	Date Applied
1R3	11/14/06
--	09/22/05
1R3	01/22/03
--	09/14/01
1R3	11/19/98
1R4	11/19/97
1R3	01/17/96
1R4	11/07/95
1R3	07/28/95
--	01/01/91

The Summary Analysis section reflects information in D&B's file as of February 16, 2009.

NEW! **How does INTERNATIONAL-MATEX TANK TERMINALS's payment record compare to its industry?**

A Payment Trends Profile will show you - View Now

CUSTOMER SERVICE

If you have questions about this report, please call our Customer Resource Center at 1.800.234.3867 from anywhere within the U.S. If you are outside the U.S. contact your local D&B office.

*** Additional Decision Support Available ***

Additional D&B products, monitoring services and specialized investigations are available to help you evaluate this company or its industry. Call Dun & Bradstreet's Customer Resource Center at 1.800.234.3867 from anywhere within the U.S. or visit our website at www.dnb.com.

HISTORY

The following information was reported **10/27/2008**:

Officer(s): THOMAS B COLEMAN, GEN PTNR
HOWARD W STREIFFER, PTNR
RICHARD D COURTNEY, PTNR
JOHN SIRAGUSA, PTNR
BERTRAND F ARTIGUES, PTNR

DIRECTOR(S): THE OFFICER(S)

Ownership information provided verbally by Joe Benson, Asst Contrl, on Nov 12 2007.

Business started 1975 by the partners.

100% of interest is owned by International Tank Terminals LTD. The number of limited partners in undetermined.

THOMAS B COLEMAN born 1946. 1972-present active here. 1965 employed with International Tank Terminals Ltd.

HOWARD W STREIFFER born 1946. 1975-present active here.

RICHARD D COURTNEY born 1951. 1975-present active here.

JOHN SIRAGUSA born 1951. 1988-present active here.

BERTRAND F ARTIGUES born 1938. 1975-present active here.

CORPORATE FAMILY

Click below to buy a Business Information Report on that family member.
For an expanded, more current corporate family view, use D&B's Global Family Linkage product.

Buy Selected Report(s)

Subsidiaries (US):

☐ East Jersey Railroad & Terminal Co Inc	Bayonne, NJ	DUNS # 04-471-0127
☐ St. Rose Nursery, Inc.	Saint Rose, LA	DUNS # 17-390-7890

Subsidiaries (International):

☐ IMTT-Québec Inc	Québec, CANADA	DUNS # 24-835-2445

Branches (US):

☐ International-Matex Tank Terminals	Richmond, CA	DUNS # 92-958-1742
☐ International-Matex Tank Terminals	Lemont, IL	DUNS # 10-318-1020
☐ International-Matex Tank Terminals	Harvey, LA	DUNS # 09-859-9491
☐ International-Matex Tank Terminals	Westwego, LA	DUNS # 12-461-7291
☐ International-Matex Tank Terminals	Bayonne, NJ	DUNS # 15-432-5815
☐ International-Matex Tank Terminals	Chesapeake, VA	DUNS # 15-449-5212
☐ International-Matex Tank Terminals	Richmond, VA	DUNS # 11-920-9294

Buy Selected Report(s)

OPERATIONS

10/27/2008

Description: Provides special warehousing and storage, specializing in leasing petroleum or chemical bulk stations or terminals (100%).

Has 100 account(s). Terms are net 30 days. Sells to commercial concerns. Territory : United States.

Nonseasonal.

Employees: 1,000 which includes partners. 70 employed here.

Facilities: Leases premises in on 2nd floor of a multi story concrete block building.

Location: Central business section on main street.

Branches: This business has multiple branches, detailed branch/division information is available in Dun & Bradstreets linkage or family tree products.

Subsidiaries: The company has numberous subsidiaries, a complete list has been declined.

SAINT ROSE NURSERY INC, New Orleans, LA. Started 1984. Nursery. DUNS 17-390-7890. Intercompany relations consist of similarity of certain officers. No loans, endorsements or guarantees were reported.

SIC & NAICS

SIC:

Based on information in our file, D&B has assigned this

NAICS:

493190 Other Warehousing and Storage

company an extended 8-digit SIC. D&B's use of 8-digit SICs enables us to be more specific to a company's operations than if we use the standard 4-digit code.

The 4-digit SIC numbers link to the description on the Occupational Safety & Health Administration (OSHA) Web site. Links open in a new browser window.

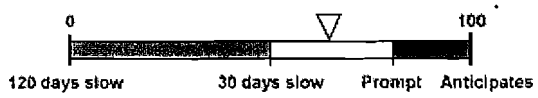
42260102 Petroleum and chemical bulk stations and terminals for hire

D&B PAYDEX

NEW! Enhanced payment trends and industry benchmarks are available on this business

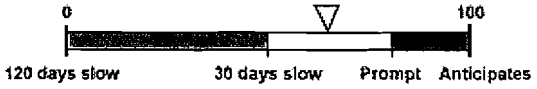
The D&B PAYDEX is a unique, dollar weighted indicator of payment performance based on up to 229 payment experiences as reported to D&B by trade references.

3-Month D&B PAYDEX: 67
When weighted by dollar amount, payments to suppliers average 18 days beyond terms.



Based on trade collected over last 3 months.

12-Month D&B PAYDEX: 67
When weighted by dollar amount, payments to suppliers average 18 days beyond terms.



Based on trade collected over last 12 months.

When dollar amounts are not considered, then approximately 86% of the company's payments are within terms.

PAYMENT SUMMARY

The Payment Summary section reflects payment information in D&B's file as of the date of this report.

Below is an overview of the company's dollar-weighted payments, segmented by its suppliers' primary industries:

	Total Rcv'd (#)	Total Dollar Amts ($)	Largest High Credit ($)	Within Terms (%)	Days Slow <31 (%)	31-60 (%)	61-90 (%)	90> (%)
Top industries:								
Nonclassified	22	165,400	45,000	86	10	-	4	-
Telephone communictns	17	47,850	15,000	68	16	16	-	-
Electric services	8	153,000	85,000	100	-	-	-	-
Whol industrial suppl	6	47,350	40,000	89	11	-	-	-
Whol industrial equip	4	112,750	100,000	96	4	-	-	-
Whol chemicals	2	515,000	500,000	100	-	-	-	-
Mfg computers	2	90,100	90,000	50	50	-	-	-
Ret-direct selling	2	60,000	55,000	100	-	-	-	-
Custom compounding	1	700,000	700,000	-	50	50	-	-
Mfg oil/gas machinery	1	75,000	75,000	100	-	-	-	-
OTHER INDUSTRIES	151	527,700	45,000	75	23	2	-	-
Other payment categories:								
Cash experiences	5	250	50					
Payment record unknown	8	176,000	95,000					
Unfavorable comments	0	0	0					
Placed for collections:								
With D&B	0	0						
Other	0	N/A						
Total in D&B's file	229	2,670,400	700,000					

The highest **Now Owes** on file is $300,000

The highest **Past Due** on file is $30,000

Dun & Bradstreet has 229 payment experiences in its file for this company. For your convenience, we have displayed 80 representative experiences in the PAYMENTS section.

NEW! How does INTERNATIONAL-MATEX TANK TERMINALS's payment record compare to its industry?

A Payment Trends Profile will show you - View Now

PAYMENT DETAILS

Detailed Payment History

Date Reported (mm/yy)	Paying Record	High Credit ($)	Now Owes ($)	Past Due ($)	Selling Terms	Last Sale Within (months)
02/09	Ppt	1,000	0			2-3 mos
	Ppt	1,000	50			2-3 mos
	Ppt	750	250			
	Ppt	750	100			
01/09	Ppt	85,000	60,000	0	N30	1 mo
	Ppt	55,000	35,000	0	N30	1 mo
	Ppt	40,000	0	0		6-12 mos
	Ppt	35,000	25,000	10,000		1 mo
	Ppt	35,000	0	0		6-12 mos
	Ppt	25,000	20,000	0		
	Ppt	15,000	0	0		6-12 mos
	Ppt	15,000	250	0		1 mo
	Ppt	10,000	5,000	0		
	Ppt	10,000	750	0	N30	1 mo
	Ppt	7,500	5,000	0		1 mo
	Ppt	7,500	2,500	0		1 mo
	Ppt	5,000	250	0	N30	4-5 mos
	Ppt	5,000	5,000	0		1 mo
	Ppt	5,000	5,000	100		1 mo
	Ppt	2,500	0	0		2-3 mos
	Ppt	2,500	2,500	0		1 mo
	Ppt	2,500	2,500	0		1 mo
	Ppt	2,500	2,500	0	N30	1 mo
	Ppt	2,500	0	0		6-12 mos
	Ppt	2,500	750	0		1 mo
	Ppt	2,500	0	0		6-12 mos
	Ppt	1,000	750	0		1 mo
	Ppt	1,000	0	0		2-3 mos
	Ppt	750	0	0		6-12 mos
	Ppt	750	750	0		1 mo
	Ppt	750	0	0		2-3 mos
	Ppt	750	750	0		1 mo
	Ppt	750	0	0		2-3 mos
	Ppt	750	0	0		1 mo
	Ppt	500	500	0		1 mo
	Ppt	500	500	0		1 mo
	Ppt	500	500	0		1 mo

	Ppt	500	500	0	Lease Agreemnt	1 mo
	Ppt	500	250	0	N30	1 mo
	Ppt	500	250	0	N30	1 mo
	Ppt	500	500	0		1 mo
	Ppt	500	0	0		6-12 mos
	Ppt	500	500	0		1 mo
	Ppt	250	50	50		1 mo
	Ppt	250	0	0		4-5 mos
	Ppt	250	0	0		6-12 mos
	Ppt	250.	0	0		4-5 mos
	Ppt	250	0	0		2-3 mos
	Ppt	250	0	0		2-3 mos
	Ppt	250	0	0		6-12 mos
	Ppt	100	0	0		6-12 mos
	Ppt	100	0	0		6-12 mos
	Ppt	100	100	0		1 mo
	Ppt	100	100	0		1 mo
	Ppt	50	50	0		1 mo
	Ppt	50	0	0	N30	6-12 mos
	Ppt	50	50	0		1 mo
	Ppt	50	0	0		6-12 mos
	Ppt-Slow 15	500	0	0		2-3 mos
	Ppt-Slow 30	15,000	15,000	5,000		1 mo
	Ppt-Slow 30	10,000	10,000	10,000	N30	2-3 mos
	Ppt-Slow 30	7,500	0	0	N30	6-12 mos
	Ppt-Slow 30	5,000	5,000	50		1 mo
	Ppt-Slow 30	2,500	250	0		1 mo
	Ppt-Slow 30	2,500	2,500	750		1 mo
	Ppt-Slow 30	1,000	0	0		4-5 mos
	Ppt-Slow 30	750	750	100	N10	1 mo
	Slow 5	100	0	0		6-12 mos
	Slow 15	100	0	0	N30	6-12 mos
	Slow 25	5,000	0	0	N30	2-3 mos
	Slow 30	30,000	30,000	30,000		1 mo
	Slow 30	1,000	0	0		2-3 mos
	Slow 30	750	250	0		1 mo
	Slow 80	1,000	0	0		4-5 mos
	Slow 90+	100	50	50		
	(076) Cash own option.	50			Cash account	4-5 mos
	(077) Cash own option.	50			Cash account	1 mo
	(078) Cash own option.	50			Cash account	4-5 mos
	(079) Cash own option.	50			Cash account	1 mo
12/08	Ppt-Slow 60	500	0	0		6-12 mos

Payment experiences reflect how bills are met in relation to the terms granted. In some instances payment beyond terms can be the result of disputes over merchandise, skipped invoices etc.

Each experience shown is from a separate supplier. Updated trade experiences replace those previously reported.

NEW! **How does INTERNATIONAL-MATEX TANK TERMINALS's payment record compare to its industry?**

A Payment Trends Profile will show you - View Now

FINANCE

11/12/2007

On NOV 12 2007 Joe Benson, Asst Contrl, deferred financial statement.

Joe Benson submitted the following partial estimates dated NOV 12 2007:

Sales for 2006 were $200,000,000.

BANKING

01/09 Borrowing account. Now owing low 8 figures.

PUBLIC FILINGS

The following Public Filing data is for information purposes only and is not the official record. Certified copies can only be obtained from the official source.

SUITS

Status:	**Pending**
DOCKET NO.:	L 005051 06
Plaintiff:	LISETTE ROMAN
Defendant:	INTERNATIONAL MATEX TANK TERMI, BAYONNE, NJ AND OTHERS
Cause:	TORT - TOXIC
Where filed:	MIDDLESEX COUNTY SUPERIOR COURT, NEW BRUNSWICK, NJ
Date status attained:	06/29/2006
Date filed:	06/29/2006
Latest Info Received:	11/13/2006

Status:	**Pending**
DOCKET NO.:	L 002627 04
Plaintiff:	CARMEL SIERP
Defendant:	INTERNATIONAL MATEX TANK TERMI AND OTHERS
Where filed:	HUDSON COUNTY SUPERIOR COURT, JERSEY CITY, NJ
Date status attained:	05/10/2004
Date filed:	05/10/2004
Latest Info Received:	12/27/2005

If it is indicated that there are defendants other than the report subject, the lawsuit may be an action to clear title to property and does not necessarily imply a claim for money against the subject.

UCC FILINGS

Collateral:	All Negotiable instruments and proceeds - All Inventory and proceeds - All General intangibles(s) and proceeds - All Contract rights and proceeds - and OTHERS
Type:	Amendment
Sec. party:	BANK OF AMERICA N A, NORFOLK, VA
Debtor:	IMTT CHESAPEAKE, CHESAPEAKE, VA and OTHERS
Filing number:	20030077667K
Filed with:	SECRETARY OF STATE/UCC DIVISION, RALEIGH, NC
Date filed:	08/01/2003
Latest Info Received:	08/25/2003
Original UCC filed date:	11/20/2000
Original filing no.:	20000114237

Collateral:	Negotiable instruments
Type:	Original
Sec. party:	LASALLE BANK NATIONAL ASSOCIATION, CHICAGO, IL

Debtor: IMTT - BAYONNE, BAYONNE, NJ and OTHERS
Filing number: 2310045 4
Filed with: SECRETARY OF STATE/UCC DIVISION, DOVER, DE

Date filed: 12/11/2002
Latest Info Received: 01/06/2003

Collateral: Negotiable instruments
Type: Original
Sec. party: LASALLE BANK NATIONAL ASSOCIATION, CHICAGO, IL
Debtor: IMTT - BAYONNE, BAYONNE, NJ and OTHERS
Filing number: 2310042 1
Filed with: SECRETARY OF STATE/UCC DIVISION, DOVER, DE

Date filed: 12/11/2002
Latest Info Received: 01/06/2003

Collateral: Negotiable instruments
Type: Original
Sec. party: LASALLE BANK NATIONAL ASSOCIATION, CHICAGO, IL
Debtor: IMTT - BAYONNE, BAYONNE, NJ and OTHERS
Filing number: 2310041 3
Filed with: SECRETARY OF STATE/UCC DIVISION, DOVER, DE

Date filed: 12/11/2002
Latest Info Received: 01/06/2003

Collateral: Account(s) and proceeds - Computer equipment and proceeds - General intangibles(s) and proceeds - Chattel paper and proceeds - Business machinery/equipment and proceeds
Type: Original
Sec. party: BANC OF AMERICA LEASING & CAPITAL, LLC, TROY, MI
Debtor: INTERNATIONAL-MATEX TANK TERMINALS, LEMONT, IL
Filing number: 2008 1942331
Filed with: SECRETARY OF STATE/UCC DIVISION, DOVER, DE

Date filed: 06/06/2008
Latest Info Received: 07/02/2008

Collateral: Account(s) and proceeds - Computer equipment and proceeds - General intangibles(s) and proceeds - Chattel paper and proceeds - Business machinery/equipment and proceeds
Type: Original
Sec. party: BANC OF AMERICA LEASING & CAPITAL, LLC, TROY, MI
Debtor: INTERNATIONAL-MATEX TANK TERMINALS, LEMONT, IL
Filing number: 2008 0382521
Filed with: SECRETARY OF STATE/UCC DIVISION, DOVER, DE

Date filed: 01/31/2008
Latest Info Received: 02/28/2008

Collateral: Equipment
Type: Original
Sec. party: TOYOTA MOTOR CREDIT CORPORATION, TORRANCE, CA
Debtor: INTERNAIONAL MATEX TANK TERMINALS, LEMONT, IL
Filing number: 6076596 6
Filed with: SECRETARY OF STATE/UCC DIVISION, DOVER, DE

Date filed: 03/06/2006
Latest Info Received: 04/06/2006

Collateral: Equipment
Type: Original
Sec. party: AIR LIQUIDE INDUSTRIAL U S LP, HOUSTON, TX
Debtor: IMTT-BAYONNE, BAYONNE, NJ
Filing number: 5042194 2
Filed with: SECRETARY OF STATE/UCC DIVISION, DOVER, DE

Date filed: 02/07/2005
Latest Info Received: 03/02/2005

Collateral: Equipment
Type: Amendment
Sec. party: AIR LIQUIDE INDUSTRIAL U S LP, HOUSTON, TX
Debtor: IMTT-BAYONNE, BAYONNE, NJ
Filing number: 5265614 9
Filed with: SECRETARY OF STATE/UCC DIVISION, DOVER, DE

Date filed: 08/25/2005
Latest Info Received: 10/14/2005
Original UCC filed date: 02/07/2005
Original filing no.: 5042194 2

Collateral: Equipment
Type: Original
Sec. party: MAINTAINCO, INC., S. HACKENSACK, NJ
Debtor: IMIT BAYONNE, BAYONNE, NJ and OTHERS
Filing number: 22322456
Filed with: SECRETARY OF STATE/UCC DIVISION, TRENTON, NJ

Date filed: 04/19/2004
Latest Info Received: 05/06/2004

Collateral: Equipment
Type: Original
Sec. party: TOYOTA FINANCIAL SERVICE CO., TORRANCE, CA
Debtor: IMTT BAYONNE, BAYONNE, NJ and OTHERS
Filing number: 21799235
Filed with: SECRETARY OF STATE/UCC DIVISION, TRENTON, NJ

Date filed: 06/26/2003
Latest Info Received: 10/17/2003

There are additional UCC's in D&B's file on this company available by contacting 1-800-234-3867.

The public record items contained in this report may have been paid, terminated, vacated or released prior to the date this report was printed.

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Business Information Report

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ATTN: **TSI NB 001 111** Report Printed: FEB 17 2009

BUSINESS SUMMARY

BAYONNE INDUSTRIES INC
321 Saint Charles Ave
New Orleans, LA 70130

Now Included with this Report NEW!
D&B's Credit Limit Recommendation
D&B's industry and risk-based limit guidance
Learn More View Now

This is a **single** location.

Telephone: 504 586-8300

Chief executive: THOMAS COLEMAN, PRESIDENT

Year started: 1956
Management control: 1983

Employs: 3

History: CLEAR
SIC: 4226

Line of business: Bulk liquid storage

D-U-N-S Number: 06-428-8855

D&B Rating: --

SPECIAL EVENTS

10/28/2008
2008 HURRICANE GUSTAV: This business is located in a FEMA Individual Assistance designated disaster area and may have been impacted by the effects of this hurricane.

02/06/2006
A premise visit to listed address the week of January 9th, 2006, revealed business to be operational with no visible damage to building.

12/14/2005
An investigation by D&B has determined that this business is in operation.

SUMMARY ANALYSIS

D&B Rating:--

The blank rating symbol should not be interpreted as indicating that credit should be denied. It simply means that the information available to D&B does not permit us to classify the company within our rating key and that further enquiry should be made before reaching a decision. Some reasons for using a "-" symbol include: deficit net worth, bankruptcy proceedings, insufficient payment information, or incomplete history information. For more information, see the D&B Rating Key.

Below is an overview of the company's rating history since 01/06/93:

CCB000022

D&B Rating	Date Applied
--	01/06/93

The Summary Analysis section reflects information in D&B's file as of February 16, 2009.

INVESTIGATIVE SERVICES

***** Update available on request *****

This information is being provided to you immediately in the interest of speed. This report may not reflect the current status of this business. D&B can investigate this business and update the information based on the results of that investigation.

By ordering a standard investigation the same day you order this report, an updated report will be provided to you at no extra cost.

CUSTOMER SERVICE

If you have questions about this report, please call our Customer Resource Center at 1.800.234.3867 from anywhere within the U.S. If you are outside the U.S. contact your local D&B office.

*** Additional Decision Support Available ***

Additional D&B products, monitoring services and specialized investigations are available to help you evaluate this company or its industry. Call Dun & Bradstreet's Customer Resource Center at 1.800.234.3867 from anywhere within the U.S. or visit our website at www.dnb.com.

HISTORY

The following information was reported **12/03/2008**:

Officer(s): THOMAS COLEMAN, PRESIDENT
RICHARD JURISICH, V PRES
HOWARD STREIFFER, TREAS

DIRECTOR(S): THE OFFICER(S)

Business started 1956 by Pittston Co Inc and Texaco Inc. Present control succeeded 1983. 100% of capital stock is owned by the officers.

THOMAS COLEMAN born 1943. 1965 graduated from Stanford University. 1965 to present active with related interests.

RICHARD JURISICH born 1936. 1959 graduated from Tulane University. 1959 to present active with related interests.

HOWARD STREIFFER born 1943. 1967 graduated from Tulane University. 1972 to present active with related interests.

RELATED INTERESTS:

Van Ommeren, Netherlands, Holland. Started in 1838. Operates as tank storage, shipping and trading service.

Civic Center Site Development Co, Inc, New Orleans, LA. Started in 1958. Operates a hotel.

Downtown Parking Service, New Orleans, LA. Started in 1960. Operates parking lots.

International Properties Inc (IPI), New Orleans, La. Started in 1951. Operates commercial buildings and apartments.

Coleman, Johnson & Artigues, New Orleans, LA. Started in 1946. Operates as a law firm.

International Trading & Transport, New Orleans, LA. Started in 1973. Wholesales petroleum.

International Tank Terminals Ltd, New Orleans, LA. Started in 1946. Wholesales petroleum.

Gravier Properties, New Orleans, LA. Started in 1982. Operates as a construction company.

St Rose Nursery, Inc, New Orleans, LA. Started in 1984. Operates as a plant nursery.

International Trading & Transportation, New Orleans, LA. Started in 1973. Wholesales petroleum.

Splitt, Inc, New Orleans, LA. Started in 1974. Operates as a pipeline company.

International Matex Tank Terminal, New Orleans, LA. Started in 1975. Operates as a bulk storage terminal operator.

Intercompany relations were declined.

Business address has changed from 321 Saint Charles Ave, New Orleans, LA, 70130 to 321 Saint Charles Ave , New Orleans, LA, 70130.

Business address has changed from 321 Saint Charles Ave , New Orleans, LA, 70130 to 321 Saint Charles Ave, New Orleans, LA, 70130.

BUSINESS REGISTRATION

CORPORATE AND BUSINESS REGISTRATIONS PROVIDED BY MANAGEMENT OR OTHER SOURCE

The Corporate Details provided below may have been submitted by the management of the subject business and may not have been verified with the government agency which records such data.

Registered Name: BAYONNE INDUSTRIES INC

Business type: CORPORATION
Corporation type: PROFIT
Date incorporated: JAN 19 1985
State of incorporation: NEW JERSEY
Filing date: JAN 19 1985

Where filed: DEPT OF STATE, TRENTON, NJ

OPERATIONS

12/03/2008

Description: Operates as a bulk liquid storage facility (100%).

Terms are net 30 days. Sells to commercial concerns. Territory : Local.

Nonseasonal.

Employees: 3 which includes officer(s).

Facilities: Rents premises in a building.

SIC & NAICS

SIC:
Based on information in our file, D&B has assigned this company an extended 8-digit SIC. D&B's use of 8-digit SICs enables us to be more specific to a company's operations than if we use the standard 4-digit code.

The 4-digit SIC numbers link to the description on the Occupational Safety & Health Administration (OSHA) Web site. Links open in a new browser window.

42260100 Liquid storage

NAICS:
493190 Other Warehousing and Storage

PAYMENT SUMMARY

D&B has not received a sufficient sample of payment experiences to establish a PAYDEX score.

The Payment Summary section reflects payment information in D&B's file as of the date of this report.

Below is an overview of the company's dollar-weighted payments, segmented by its suppliers' primary industries:

	Total Rcv'd (#)	Total Dollar Amts ($)	Largest High Credit ($)	Within Terms (%)	Days Slow <31 (%)	31-60 (%)	61-90 (%)	90> (%)
Top industries:								
Misc publishing	1	500	500	100	-	-	-	-
Other payment categories:								
Cash experiences	0	0	0					
Payment record unknown	0	0	0					
Unfavorable comments	0	0	0					
Placed for collections:								
With D&B	0	0						
Other	0	N/A						
Total in D&B's file	1	500	500					

The highest **Now Owes** on file is $0

The highest **Past Due** on file is $0

D&B receives over 600 million payment experiences each year. We enter these new and updated experiences into D&B Reports as this information is received.

PAYMENT DETAILS

Detailed Payment History

Date Reported (mm/yy)	Paying Record	High Credit ($)	Now Owes ($)	Past Due ($)	Selling Terms	Last Sale Within (months)
11/08	Ppt	500	0	0		6-12 mos

Each experience shown is from a separate supplier. Updated trade experiences replace those previously reported.

FINANCE

11/21/2005

Repeated attempts to contact business were unsuccessful.

PUBLIC FILINGS

A check of D&B's public records database indicates that no filings were found for BAYONNE INDUSTRIES INC at 321 Saint Charles Ave, New Orleans LA.

D&B's extensive database of public record information is updated daily to ensure timely reporting of changes and additions. It includes business-related suits, liens, judgments, bankruptcies, UCC financing statements and business registrations from every state and the District of Columbia, as well as select filing types from Puerto Rico and the U.S. Virgin Islands.

D&B collects public records through a combination of court reporters, third parties and direct electronic links with federal and local authorities. Its database of U.S. business-related filings is now the largest of its kind.

GOVERNMENT ACTIVITY

Activity summary

Borrower (Dir/Guar): NO

Administrative debt:	NO
Contractor:	NO
Grantee:	NO
Party excluded from federal program(s):	NO

Possible candidate for socio-economic program consideration

Labor surplus area:	N/A
Small Business:	YES (2009)
8(A) firm:	N/A

The details provided in the Government Activity section are as reported to Dun & Bradstreet by the federal government and other sources.

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State of New Jersey

James E. McGreevey
Governor

Department of Environmental Protection

Bradley M. Campbell
Commissioner

Bureau of Case Management
P.O. Box 028
401 East State Street
Trenton, NJ 08625-0028
Telephone: (609) 633-1455
Facsimile: (609) 633-1439

Certified Mail
Return Receipt Requested
No. 7002 2410 0002 5923 1748

JAN 0 8 2004

Rusty Walker
Director of Environment, Health & Safety
International Matex Tank Terminals
321 St. Charles Street
New Orleans, LA 70130

Dear Mr. Walker:

Re: In the Matter of the Bayonne Industries Site, Cogen Technologies, and Bayonne Industries, Inc. (BI)
City of Bayonne, Hudson County, New Jersey
Program ID No. 002552
Memorandum of Agreement (MOA) dated 27 May 1992
Remediation Agreement (RA) dated 22 January 1999 - ISRA Case # 98513
Free Product Investigation Work Plan (Plan) dated May 2003
Site Investigation Report (SIR) dated July 2003

The New Jersey Department of Environmental Protection (Department or NJDEP) has reviewed the subject Plan and SIR. Both documents are unacceptable as submitted. BI shall prepare a Revised Plan and Revised SIR that conform to the comments in this correspondence and the Technical Requirements for Site Remediation (TRSR), N.J.A.C. 7:26E-1 et seq. The Revised Plan and Revised SIR shall be submitted within ninety (90) calendar days from your receipt of this correspondence and include the notarized certification that is required by the Rules for Department Oversight for the Remediation of Contaminated Sites (Oversight Rules), N.J.A.C. 7:26C-1.2. The site will be referred to the Department's Office of Accountability and the MOA may be terminated if BI submits another deficient document or fails to meet the specified due date.

The deficiencies that the NJDEP identified during its review of the subject Plan prompted an evaluation of the administrative record for this case. As a result, this deficiency letter not only comments on the Plan itself, it also specifies/reiterates important requirements that have not been satisfied by BI. The following points summarize the remediation efforts at the site:

- The nature and extent of free/residual product contamination are unknown,
- All potential source areas and areas of concern (AOCs) have yet to be identified and investigated,
- The nature and extent of soil contamination have not been investigated, characterized, or delineated,
- The ground water characteristics have not been fully established for the site,
- The nature and extent of ground water contamination have not been investigated, characterized, or delineated,
- All potential contaminant migration pathways have not been identified and investigated,
- Potential risks to ecological/human receptors have not been identified, evaluated, investigated, and/or assessed.

Comments on the Free Product Investigation Work Plan (Plan)

1. Scope of Investigation

The Plan represents BI's response to the NJDEP's 26 March 2003 comment on the Cone Penetrometer Survey Findings Report (CPT Report) and proposes supplemental investigation for two areas discussed in the CPT Report along with four additional areas of free product. However, the 26 March 2003 comment letter required that BI submit a plan for these areas and "...any other area of the site where product may potentially exist." Given this requirement, available information, and BI's verbal or written representations that product exists across the site, BI was required to submit a Plan that proposed to investigate the entire site, at a minimum, with contingencies to investigate free/residual product emanating from the site. The NJDEP also notes that its 2 October 1998 comment letter on BI's Phase I Remedial Investigation Report (RIR) also required BI to expedite its efforts to identify product sources areas and delineate the extent of product contamination, including any off-site migration. The Plan fails to satisfy this goal.

Therefore, the Revised Plan shall propose to completely and thoroughly investigate any/all potential areas where free or residual product may exist on and/or be emanating from any portion of the entire site. The Revised Plan shall also include full justification/explanation for the locations for all proposed soil borings, monitor wells, and/or other investigative devices. The existence of buildings, pipelines, containment areas, and/or other structures shall not serve as justification to forgo investigation (and subsequent remediation) of an area that is known or suspected to be contaminated with free/residual product. In short, BI shall pursue/ exhaust all possible methods, approaches, and alternatives to investigate/remediate areas of known or suspected product contamination.

2. Format/Content of Revised Plan

The Revised Plan shall present/include, without limitation, all of the historical information, available data, and proposed activities in an area-by-area format that also identifies all AOCs within each area. Scaled maps/figures shall also be included and depict all of the details required pursuant to the TRSR (e.g. - all current/former AOCs, all underground pipelines/utilities, all existing sampling locations, and all proposed sampling locations). Overlays depicting existing data on the horizontal and vertical extent of free/residual product shall also be provided.

3. Co-Gen/Yard 10 Area, Section 2.1 and Section 4.1

a. Requirements for Product Investigation, Remediation, and Disposal

Comment 1.a of the NJDEP's 26 March 2003 comment letter required BI to install seven additional monitor wells (in addition to the five proposed in BI's February 2002 report) to confirm the CPT survey results in Yard 10. These wells are needed to confirm the presence/absence of free product in locations at which a UV fluorescence intensity of 0.5 V or greater was observed in the CPT/UV fluorescence survey in this area and Yard 4. If free product is found in locations that had 0.5 V intensity, free product delineation shall continue in areas where lower fluorescence intensities were observed. This approach is required because the relationship between fluorescence intensity and the presence of free product in this area is unknown. Different types of hydrocarbons fluoresce at different intensities in the presence of UV light. In general, heavier hydrocarbons fluoresce more intensely than lighter ones. Using a UV lamp with shorter wavelength may enhance the detection of lighter fuels. The types of hydrocarbons in this area are unknown and BI only used one type of UV lamp during its investigations.

As depicted on Figure 3 of the Plan, BI has proposed to install four additional monitor wells instead of the seven required by the NJDEP. Of the four wells proposed, two conform to the NJDEP requirements (CPT locations Y10-029 and Y10-031) and shall be retained in the Revised Plan. However, BI does not propose to install monitor wells in CPT locations Y10-001, Y10-002, Y10-003, Y10-008 or Y10-020 as required. As for the two other monitor wells that BI proposes to install, the locations are 150 feet east and 190 feet southeast of a point midway between former temporary wells 15b and 23. The Department has the following comments on BI's proposal:

i. BI states that two of the NJDEP required monitor well locations are 42 feet apart, but does not specify which locations are in question. Therefore, the NJDEP presumes that BI may be referring to CPT-Y10-001, 002 and/or 003. BI is notified that the objective of the required investigation is to confirm the results of the CPT survey and to delineate the extent of free product detected in former temporary well 23 to the east, west and south. For confirmation of the CPT results, BI shall install a monitor well in the location of Y10-CPT-002 (where ~ 0.8V UV intensity was detected). If free product is detected at the Y10-CPT-002 location, it will be assumed that free product is present at CPT-001, since it is located approximately 50 feet to the east of Y10-CPT-002 and 40-50 feet west of former temporary well 23 (where the presence of free product is already confirmed). However, the CPT results in the direction of Y-10-CPT-003 shall still be confirmed by installation of soil borings/monitor wells.

ii. BI shall install monitor wells at CPT locations CPT-Y10-008, CPT-Y10-010 and CPT-Y10-020 where UV intensities of ~ 0.5 V-0.75 V were observed.

iii. Any free product detected in these monitor wells shall be completely delineated per N.J.A.C. 7:26E-4.4(h)3i. The Revised Plan shall include all supporting documentation and all results of previous investigations in this area. The Department highly recommends that BI first install soil borings by continuous split spoon sampling or the direct-push method to determine the optimum placement of monitor wells and screen intervals for free product delineation.

iv. The proposal for two monitor wells 150-190 feet east of the boundary of Yard 10 is unacceptable for delineation purposes because the proposed locations are too far away from the boundary of Yard 10 to delineate free product in this area. However, the proposed monitor wells shall be installed to investigate the potential for free/residual product to exist at their respective locations.

v. BI proposes to install two additional recovery wells (designated Y10-RW-3 and Y10-RW-4) to the existing ground water-product recovery system in this area. The existing system uses recovery wells Y10-RW-1 and Y10-RW-2 to recover total fluids (oil and ground water), was installed at risk by BI and began operation on 21 November 2000. The recovered free product and ground water are discharged to an oil-water separator where the oil is recovered and the water is sent to the plant water treatment system. Under other circumstances, the NJDEP might be able to approve the current proposal in its entirety as an IRM. However, the Department is concerned that the transport of recovered ground water to the BI wastewater sewer system might constitute a discharge of contaminants to soil and/or ground water in another part of the site. Therefore, consistent with N.J.A.C. 7:26E-6.1(b)4, the NJDEP cannot approve this component of the proposal. However, the Revised Plan shall retain the proposal to install/operate Y10-RW-3 and Y10-RW-4 and present a modified/alternate method for conveying the contaminated ground water to the on-site treatment plant or a permitted off-site disposal facility.

To clarify, please refer to the Department's 22 July 1993 comment letter regarding reports in the May 1993 Final Draft Remedial Investigation Work Plan that the combined storm and process sewer system for the plant was reported to be unsound. The NJDEP's letter also noted reports that several of the sewer lines shown on the 1921 and 1948 historic site maps were constructed of wood. The letter required BI to provide NJDEP with a map(s) indicating the locations of active and inactive sewer lines

and, if possible, noting their construction. Said letter also required BI to propose a plan to investigate the structural integrity of the sewer lines onsite. The Department's 2 October 1998 letter on the Phase I RIR repeated these requirements and the TRSR, N.J.A.C. 7:26E-3.1(c)1.v and 3.9(d) also required BI to identify/investigate these lines.

To date, BI has not submitted the required work plan or performed the work to satisfy this regulatory requirement. As a result, BI is directed to immediately cease the discharge from existing RW-1 and RW-2 to the on-site sewer system until BI demonstrates to NJDEP that the piping used to convey recovered ground water from the oil/water separator to the on-site wastewater treatment system is sound. However, BI shall continue to operate RW-1 and RW-2. The recovered product and ground water shall be diverted to tanks or tank trucks for subsequent transport to the on-site treatment system or a permitted, off-site disposal facility.

While operation of the recovery wells continues, BI shall:

- perform a video inspection of the existing wastewater piping between the recovery system and treatment plant, and repair all leaking/damaged piping upon detection
- provide the NJDEP with acceptable records proving that the integrity of the conveyance system is intact and prevents the discharge of contaminated wastewater to soil and/or ground water. Said records shall consist of video inspection tapes and documentation that any/all required repairs have already been completed in a manner that prevents discharges,
- replace all of the existing piping between these two locations with new piping or install new dedicated piping for this IRM, or
- employ tanks or tank trucks and subsequent transport to the on-site treatment system or a permitted, off-site disposal facility as the long-term waste management strategy.

BI shall provide verbal and written notice regarding which of the listed solutions will be implemented along with an acceptable (i.e. - accelerated/aggressive) schedule by 30 January 2004. The schedule shall depict a commitment to provide two weeks advance notice for any future work and to submit a detailed, comprehensive report of the findings once the work is complete.

vi. Delineation of free product in Yard 10 (and adjacent areas that may be affected by this product plume) is still incomplete. Therefore, product delineation shall be completed and a product recovery system shall be designed for the entire free product plume once delineation is complete.

The Department previously notified BI that product delineation is required in the interior of Yard 10 and to the east and southeast, at a minimum, based on CPT results and the detection of free product to date. BI proposes that delineation inside Yard 10 should be performed after the installation of the confirmatory monitor wells for the results of the CPT/UV fluorescence investigation and the three monitor wells proposed as part of the boiler unit construction. Delineation outside of Yard 10 is also required based on the detection of free product in former temporary wells 15b and 23. Please see 2.a. iii, above. In addition, the northeast corner of Yard 10 has not been investigated yet and shall be included.

The proposal to install three monitor wells at the locations that BI associates with the boiler project is conditionally acceptable and shall be retained in the Revised Plan. However, BI is reminded that it shall still treat/remove all product beneath the boiler foundation (see NJDEP letters dated 9 May 2003 and 5 September 2003 for further clarification). In addition, BI shall protect the soil used to restore the boiler area from becoming contaminated by product and shall ultimately remediate soil contamination above the applicable remediation standards. The Revised Plan shall propose to characterize/delineate the product (sheens) reported at SB-33, SB-34, and SB-36 to the west of the boiler area.

vii. BI's explanation of the purpose of the previously proposed well to the east of Y10-RW-1 and Y10-RW-2 is acceptable. If free product is detected in this well and it is converted to a recovery well, it will be considered an IRM by NJDEP. Please see 2.a.v, above. Please also see 2.a.iv, above, regarding the two new monitor wells proposed in this section.

viii. BI's response regarding the iron fouling in the existing recovery system is acceptable.

b. Significance of Reference to Historic Fill

The Plan discusses the results of soil samples collected from the Co-Gen/Yard 10 Area with respect to historic fill. BI shall explain why historic fill is mentioned in relation to the soil data and is notified that the limited information contained in the Plan does not constitute technical justification to establish an historic fill determination. Also, N.J.A.C. 7:26E-1.8 defines historic fill material as:

non-indigenous material, deposited to raise the topographic elevation of the site, which was contaminated prior to emplacement, and is in no way connected with the operations at the location of emplacement and which includes, without limitation, construction debris, dredge spoils, incinerator residue, demolition debris, fly ash, or non-hazardous solid waste. Historic fill material does not include any material which is substantially chromate chemical production waste or any other chemical production waste or waste from processing of metal or mineral ores, residues, slag or tailings. In addition, historic fill material does not include a municipal solid waste landfill site.

If BI intends to claim that the soil contamination in this area (or any other area) is related to historic fill, then BI shall adhere to the provisions of the TRSR, including without limitation N.J.A.C. 7:26E-4.6(b). The NJDEP emphasizes that N.J.A.C. 7:26E-4.6(b) stipulates that AOCs located in historic fill material shall be investigated independently of the historic fill material. BI shall differentiate between contaminants in fill and those from site discharges by conducting an evaluation of the contaminant type and concentration gradient in each AOC and the contaminant distribution in the fill shall be conducted. If this evaluation is not conclusive, then the NJDEP may require additional data or information.

4. Yard 4, Section 2.2 and Section 4.2

a. Eastern Portion

In response to the NJDEP's comment that the eastern portion of Yard 4 was omitted from the CPT investigation without justification, BI attempts to re-define the parcels that comprise Yard 4. The NJDEP notes that the RIR (ENSR, 6/94) and other documents show that Yard 4 historically included the area that BI currently acknowledges as Yard 4 and the piece of property bounded by:

- the part of Yard 4 currently acknowledged by BI and the Kenrich Petrochemical site to the west,
- to the north by Hook Road/East 22nd St.,
- to the east, by the Bayonne Durable property, Yard 5 and Yard 8 and
- to the south by the part of Yard 4 east of the GE Building area.

In addition, Figure 2 of the subject Plan shows that this piece of property is part of Yard 4 (see the boundary lines on the map). This piece of property was not included in the CPT investigation so the NJDEP stands by its prior comment. In summary, the NJDEP does not intend to engage in further debate regarding whether or not this piece of property is part of Yard 4. BI shall investigate this part of the site (and the area surrounding the GE Building). Detailed proposals to accomplish this task shall be included in the Revised Plan along with proposals to install monitor wells Y4-CPT-43, Y4-CPT-52, and all of the monitor wells proposed by BI on page 5 of the Plan.

b. Items Related to the Planned Railroad Extension Area

BI reports that monitor wells Y-4-MW-30 and Y4-MW-31 were decommissioned in May 2002 because they were in the area in where new railroad siding extensions will be built. NJDEP Well Abandonment reports for these wells are included in Appendix E and the proposed locations for replacement monitor wells are shown on Figure 4. The proposed locations for replacement monitor wells Y4-MW-30R and Y4-MW-31R are conditionally acceptable and shall be retained in the Revised Plan. However, product is reported at Y4-CPT-30, Y4-CPT-31, and Y4-CPT-34, all of which are located within and/or on the edge of the area beneath the planned railroad extensions. Therefore, the Revised Plan shall include a detailed proposal to delineate the free/residual product in this area.

Also, the Plan fails to specify the schedule for the planned railroad extensions and does not propose to remove/treat the product as required by the TRSR prior to the planned construction. The NJDEP strongly recommends that BI remove/treat all product and protect the remediated area from re-contamination, prior to constructing the railroad extensions. If BI acts to the contrary, the NJDEP will not accept the presence of the railroad extensions as a basis for claiming that the product cannot be removed/treated.

The Plan is also deficient in other respects. BI installed 8 borings (GP-1 through GP-8) in this area at the locations shown on Figure 4. However, BI does not provide the borings logs or the analytical data. The Revised Plan shall provide the logs/data. The Plan also implies that the adjacent Kenrich Petrochemical Company is an upgradient site (i.e. - source) based on ground water flow data contained in the 1996 Phase I RIR. The NJDEP reiterates its position that BI has obtained relatively little data on the ground water characteristics for this site. The Plan reinforces this position because the interpretation of ground water flow direction presented is based upon data that were collected over 7 years ago from a limited number of widely spaced monitor wells. The Plan also suggests that recently acquired soil data will be incorporated into this argument, however, BI did not include the data in the Plan. BI is notified that the NJDEP does not comment on soil quality data that have not been provided for its review. The Revised Plan shall correct these deficiencies by providing the omitted data/ logs and eliminating unsupported statements.

c. Monitor Well Requirements

It is the Department's position that a larger number of monitor wells are required to confirm the CPT/ UVIF results in this area because more than one type of product may be present. According to the historical site maps (Provisional Groundwater Remedial Investigation Workplan 10/92), the northwest portion of Yard 4 housed a tank farm (4000 series tanks), a pump house, a power house, settling tanks, contactors, piping, sewers, and an oil-water separator. The southern portion of Yard 4 housed a catalytic cracking unit, various pump houses, various tanks, a separator, a gas flare, buildings, stills, towers, and associated piping. The eastern portion of Yard 4 (where no investigation has been performed to date) housed railroad sidings, loading racks, pump houses, several tanks, a firehouse, and associated piping. Due to the large variety of potential contaminant sources formerly located in Yard 4, a heterogeneous mix of products may exist in this area.

Notwithstanding the above, the total number of the monitor wells - those proposed by BI, those required by the NJDEP (see 4.a. & 4.b, above) and existing Y4-MW-32 may be sufficient to confirm the CPT/ UVIR results in the area and are conditionally acceptable for this stage of the investigation. To ensure accuracy, the Revised Plan shall propose to install the monitor wells at the following locations:

Y4-MW-30R, Y4-MW-31R, Y4-MW-32, Y4-CPT-02, Y4-CPT-05, Y4-CPT-07, Y4-CPT-08, Y4-CPT-10, Y4-CPT-11, Y4-CPT-14, Y4-CPT-20, Y4-CPT-25, Y4-CPT-43, Y4-CPT-50A, Y4-CPT-51, Y4-CPT-54, Y4-CPT-58, between Y4-CPT-55 & Y4-CPT-59, the 2 wells south of the proposed pilot interceptor trench, and a well adjacent to the Y4-CPT-52 to investigate potential offsite contamination.

d. Voltage Intensities and Comparisons

Based on one of the responses provided, BI seems to have misinterpreted the comment which stated that "The maximum UVIF reading was approximately 0.5 V..." as applying to the majority of the CPT locations in Yard 4. This interpretation is incorrect. The statement referred only to the UV intensities reported for boring Y4-CPT-31. Appendix B of the February 2002 CPT Report shows that UVIF responses of 0.5V or greater were reported in two-thirds (41 of 62) of the CPT locations in Yard 4. Also, 14 of the 41 locations had UVIF intensities $\geq$ 1V or greater, and these were scattered throughout the area of investigation, except in the northwest corner.

The Plan also states that UVIF intensities $\leq$ 0.5V indicate that the product is old/heavy product (e.g.- fuel oil #6 and old fuel oils). However, the NJDEP notes that the cone penetrometer services brochure from Handex, the contractor who performed the CPT survey around the perimeter of the Co-Gen Area, states that heavier oils tend to fluoresce better than lighter, volatile oils. This statement is the opposite of what BI states. However, for a given type of petroleum product, the fluorescence intensity is proportional to the concentration of hydrocarbons present. So, higher intensities could indicate a heavier petroleum product or products and/or a higher concentration of petroleum in the subsurface.

The Department requires that BI explain the intent of the statement that the voltage values recorded at Yard 4 were generally less than those recorded in Yard 10. This position not readily apparent from the graphs of UVIF intensity in Appendices A and B of CPT Report dated February 2002 and some type of statistical comparison shall be conducted to support the statement.

e. Proposed Interceptor Trench

The proposed interceptor trench is conditionally acceptable as part of a pilot study, only. However, comment 3.a.v, above also applies to the product/ground water collected from the trench.

5. Free Product Investigation Technical Approach, Section 3.0

a. Terms and Definitions, Section 3.1

BI shall utilize the regulatory definitions contained in the official rule adoption that was published in the New Jersey Register on 3 February 2003 and shall not re-write the definitions with portions omitted. In addition, the Revised Plan shall not limit the use of visual identification. As currently written, stained surface soils and sheens on ground water in monitor wells would not be identified as free/residual product. The Revised Plan shall also propose to use the other methods listed at N.J.A.C. 7:26E-2.1(a)11 to render a conclusive determination on the presence/absence of free and residual product if visual identification and/or UV fluorescence are inconclusive.

b. Soil Sampling and Analytical Parameters, Section 3.2.1 and Appendix B

Due to the uncertainty and general lack of knowledge that is associated with the history of this site (BI has often stated in the past that it cannot accurately document the site history), the selection of soil analytical parameters shall conform to the TRSR, specifically N.J.A.C. 7:26E-2.1(c)2.

Although the Department's requirements for metal analyses are already established by the TRSR and the preceding paragraph, the Plan states that soil samples will be analyzed for RCRA metals using EPA Method 6010B/7471A. Therefore the NJDEP clarifies that while analyses for RCRA metals may be appropriate for waste classification/disposal purposes, the rationale for soil samples collected at this stage of the investigation shall be designed to characterize the soil column. In addition to being unable

to accurately document the site history, BI has obtained very little soil quality data to justify proposals to apply a reduced analyte list. Therefore, limiting the analyte list to these laboratory methods for RCRA metals is not acceptable to the NJDEP.

c. Ground Water Sampling and Analytical Parameters, Section 3.2.2 and Appendix B

The Plan states that ground water samples will be collected from monitor wells that do not contain free product for volatile organic compounds with a ten-compound library search (VOC+10) and semi-volatile organic compounds with a fifteen-compound library search (SVOC+15). This proposal is unacceptable because it does not conform to the minimum requirements of the TRSR. The minimum analytical requirements for petroleum storage and discharge areas are listed in Table 2-1 of TRSR. As referenced in N.J.A.C. 7:26E-2.1(d), Table2-1 states that methyl tertiary-butyl ether (MTBE) is required for all investigations for tanks that held gasoline after 1979 and tertiary-butyl alcohol (TBA) for all investigations for tanks that held gasoline after 1969. The reported spills from Tanks 6006, 5214 and 5073 were gasoline spills that occurred after 1979. Therefore, at a minimum, all ground water samples shall be analyzed for MTBE and TBA, in addition to VO+10 and SVOC+15 in the area of, and downgradient of, these spills.

Pursuant to the TRSR, N.J.A.C. 7:26E-1.7(a) 1, 2, 6 and 7, the Department has determined that VO analysis of all ground water samples at BI shall include methyl-tertiary-butyl ether (MTBE) and tertiary-butyl alcohol (TBA) as targeted compounds. The reasons for this are as follows:

i. The high water solubility, low Henry's Law constant and resistance to biodegradation of these compounds suggest that MTBE and TBA would tend to migrate a greater distance from their source areas than other components of gasoline. Also, greater impact to ground water from these compounds might be expected to result from small spills or leaks from pipelines, tanks, and other vessels/ appurtenances than from other gasoline components.

ii. Other types of petroleum products (e.g. - heating oil, diesel fuel) may become contaminated with MTBE and TBA during transport through pipelines, tankers, and/or trucks. Please see Robbins and others (1999).

iii. The NJDEP notes that historical ground water quality data included in Appendix I of the Final RIWP (ENSR 6/94) indicate the presence of MTBE and TBA in ground water at this site.

d. Liquid Measurements and Ground Water Flow Mapping, Section 3.2.3 and Appendix B

The Revised Plan shall describe the method that will be employed to correct ground water elevations for the presence of floating product. The NJDEP notes that testing free product for specific gravity is not proposed in the plan. BI shall explain.

e. Gas Chromatograph (GC) Fingerprinting, Section 3.2.4 and Appendix B

The statement that GC fingerprinting of free product will be performed when necessary is unacceptably vague. The Revised Plan shall contain a detailed description of the rationale that will be employed to determine whether or not GC fingerprinting of free product will be performed.

f. Recovery Rate Testing, Section 3.2.6

The Revised Plan shall clearly state that the recovered ground water and product from the proposed testing shall be handled in conformance with the requirements specified in comment 3.a.v, above.

6. Investigation Areas, Section 4.0

BI shall refer to the preceding comments with respect to the Co-Gen/Yard 10 Area and Yard 4 Area. The following comments apply to the four tank areas identified in the Plan and include references to the SIR as well as the Department's comments on the SIR (which are contained later in this correspondence). With regard to physical access to all areas requiring investigation at the site, BI shall propose any/all means to achieve access, including without limitation, the construction of temporary access roads to provide a means of ingress/egress for drill rigs and other equipment.

a. Tanks 1701, 1173 and 1174, Section 4.3

Soil sampling/analyses shall conform to the requirements specified in comment 5.b, above. In addition, the last sentence of the last paragraph in this section is unacceptable. If free/residual product is found, then additional investigation and delineation of the product contamination are required and shall be conducted. If no product is found, but soil and/or ground water contamination are detected above the applicable remediation standards, then additional investigation and delineation of the contaminated medium (media) are required.

b. Tank 6006 Area, Section 4.4

While the Plan discusses a 1986 discharge of 900 barrels of gasoline and TPHC levels reported above 30,000 parts per million in 1996, it does not discuss the 20,000-gallon spill at Tank 6003 (directly adjacent to Tank 6006) that occurred on 18 February 2003. As documented in the SIR, an emergency cleanup of free product and contaminated soil was subsequently completed at the Tank 6003 location and a series of post-excavation soil samples were collected to verify cleanup of the contaminated soils.

However, the SIR documents that visual surface oil is still present in the western portion of the dike between Tanks 6003 and 6006, and concludes that further investigation of this area will be performed as part of the free product investigation. However, the Plan contains no such proposals. Therefore, the Revised Plan shall propose to implement a remedial action to address the free/residual product from the February 2003 discharge and collect post-excavation soil samples to verify the remediation.

BI is notified that review of the SIR shows that the location of the post-excavation samples do not correspond with the limits of the excavation. The Revised Plan shall clarify this discrepancy. In addition, the lines designating the limits of excavation appear to be incomplete. Therefore, the text and figures in the Revised Plan shall clearly/accurately relay whether or not the excavation extended right up to the edge of the concrete wall and aboveground storage tanks in the Tank 6003/6006 berm. The AOC map (Figure 3) from the SIR cannot be utilized for this purpose because it needs to be modified to clearly define/report the limits of the excavation.

According to the SIR, the storm drain inlets in the tank berm were impacted during the release. The Revised Plan shall provide the Department with any report of the investigation and cleanout of these sewer pipes (as mentioned in the SIR) along with any data from post-remediation samples that should have been collected from the sediments/soils. The Revised Plan shall propose to perform these tasks if BI did not perform the required work or propose any/all additional measures that are warranted based on the results of these efforts.

c. Tank 5214 Area, Section 4.5

The Plan states that a gasoline spill was reported in the Tank 5214 area in August 1988 and mentions that the NJDEP's 16 April 1997 letter required BI to investigate this spill. BI proposes to install three borings as an investigative "first step" for the discharge. However, the boring locations are located in the roadway some distance from the tank and cannot address potential migration to the north, northwest, or west of Tank 5214. The proposal is unacceptable.

The Revised Plan shall propose to install five or six borings in closer proximity to the suspected leaking tank and within the tank containment area (where the spill likely pooled). The Revised Plan shall also depict the extent of the gasoline spill and include contingencies to immediately commence product recovery efforts. With regard to Figure 7 of the Plan, the Department does not accept the contention that the area labeled "No Access - Pipe Bound" is inaccessible. BI shall employ tripod drill rigs and/or other methods of investigating this area as warranted to complete the investigation. If product is known or suspected to be present in this area, then the Revised Plan shall include such proposals.

In addition, the SIR concludes that further investigation of the Tank 5077 area (directly adjacent to and west of Tank 5214) will be performed as part of the Free Product Investigation Work Plan. However, the Plan does not propose any investigation or remedial action to address the data gaps identified in the SIR. The Revised Plan shall contain detailed proposals regarding Tank 5077, along with complete justification and supporting rationale.

d. Tank 5073 Area, Section 4.6

The Plan states that 536 barrels of gasoline were discharged in the Tank 5073 area in July 1993 and free product/oily sheens were reported at Y5-T5073-01 in 1996. The Plan contains no indication that BI made any effort to recover the product or remediate this area over the past decade. BI is proposing to conduct three borings to investigate the area for free product associated with the spill. However, the boring locations are located in the apparent roadway some distance from the tank with no justification/ rationale provided for the proposed locations. This proposal is unacceptable.

The Revised Plan shall propose to install five-six borings in closer proximity to the suspected leaking tank and within the tank containment area (where the spill likely pooled). The Revised Plan shall also depict the extent of the gasoline spill and include contingencies to immediately commence product recovery efforts. With regard to previous RI sample locations, both the text and the legend on Figure 8 of the Plan mention these former locations suggesting that they have some relevance to the matter at hand. However, Figure 8 does not depict any former soil sample locations. Figure 8 of the Revised Plan shall depict the previous sample locations and BI shall note any relevant findings on the figure.

The SIR concludes that further investigation of the Tank 5076 area will be performed as part of the Free Product Investigation Work Plan. However, the Plan does not propose any investigation or remedial action to address the data gaps identified in the SIR. The Revised Plan shall contain detailed proposals regarding Tank 5076, along with complete justification and supporting rationale.

7. Quality Assurance Project Plan, Appendix B

The QAPP is unacceptable because it does not satisfy the minimum requirements of the TRSR, N.J.A.C. 7:26E-2.2. The Revised Plan shall include a modified QAPP that conforms to the TRSR and the following comments, which either complement or are in addition to comments 5.b through 5.e, above.

a. The QAPP shall include an "Analytical Methods/Quality Assurance Summary Table" per N.J.A.C. 7:26E-2.2(a) 1v.

b. The QAPP shall include a detailed description of ground water sampling methods per N.J.A.C. 7:26E-2.2(a) 1vi. Please note that Section 3.2.2 of the Plan states that ground water samples will be collected from the monitor wells that do not contain free product and states that sampling quality assurance procedures are provided in the QAPP (but they are not).

c. The QAPP shall specify holding times for samples onsite in accordance with N.J.A.C. 7:26E-2.2(a) 1vi. Section 3.3, Sample Handling does not state that samples shall immediately be placed in a cooler with ice or "blue ice" and cooled to 4°C. The QAPP shall state this procedure.

d. The QAPP shall include a detailed description of all calibration & preventative maintenance procedures for all field analytical instrumentation per N.J.A.C. 7:26E-2.2(a) vii.

e. The QAPP shall address the sealing/decommissioning of boreholes that are not ultimately converted to monitor wells. These borings shall be decommissioned in accordance with N.J.A.C. 7:9D-3.4. The NJDEP notes the statement in the QAPP (paragraph 4, page 8) that the meadow mat will not be fully penetrated, but may be penetrated to a maximum depth of 3 feet. The QAPP shall state that all borings shall be grouted, due to the possibility of fully penetrating the meadow mat, if it is less than 3 feet thick in the location of a boring that has penetrated 3 feet below the top of the meadow mat. The grouting shall be performed as soon as possible after completion of the boring, due to this possibility.

f. Paragraph 3, Section 3.2.2 of the QAPP states that split spoon samples will be logged according to the Unified Soil Classification System. While use of this system is permitted per N.J.A.C. 7:26E-3.6(a) 2ii, The NJDEP strongly prefers that the Burmister Soil Classification be used instead because the Unified Soil Classification System has seldom been found to be properly used in reports submitted for review.

g. The QAPP shall state that all drill cuttings and any soil beneath each pile of drill cuttings that has been contaminated by oil from the drill cuttings and/or as a result of drilling and/or well construction shall be removed and properly disposed.

h. The QAPP provides no technical rationale for determining the screened interval for each shallow well. Please see Comment 3.c in NJDEP's 26 March 2003 letter and revise the QAPP to conform.

i. The QAPP shall provide the technical rationale to be used to determine the screened intervals for the deep wells in the Co-Gen facility area proposed in Section 3.2.3 of the QAPP. The description of the construction methods for the deep monitor wells is incomplete. Per N.J.A.C. 7:9D-2.4(a)7, the below-grade construction of all deep wells that are installed through a confining layer shall be in accordance with the Monitor Well Requirements for Confined Unconsolidated Aquifers in Appendix 7-1 in the NJDEP's Field Sampling Procedures Manual (or FSPM dated May 1992).

In the second paragraph of Section 3.2.3 of the QAPP, BI states that, "each casing shall be drilled one foot and driven one additional foot into the confining layer". The NJDEP assumes that BI meant to state that the outer casing of each deep well shall be drilled one foot and driven one additional foot into the confining layer. The QAPP shall be revised to state the correct procedure.

BI shall clarify that the requirements for the borehole and casing diameters in the second paragraph of this section apply to all wells, both shallow and deep. This section neglects to mention that, for all double-cased wells, the diameter of the outer steel casing shall be a minimum of 4 inches greater than the diameter of the inner casing per N.J.A.C. 7:9D-2.4(a) 7 and FSPM.

j. Besides removing fine-grained material from inside the well and from the sandpack, well development should attempt to remove, to the extent possible, any layer of compacted fines around the inside of the borehole which may impede the flow of ground water and free product into the well. The QAPP shall be revised to state that this procedure shall be utilized.

k. The QAPP states (top of page 9) that, when necessary, development water from monitor wells and decontamination water will be containerized to await proper disposal. The QAPP shall be revised to clarify the meaning of "when necessary" in this context and to include specific procedures that shall be employed if BI does not intend to containerize development water.

l. Section 5.2 of the QAPP on Non-aqueous Sample Analysis states that sediment samples will be submitted for permeability testing. However, the plan does not mention the collection of sediment samples for permeability testing and no method for collecting such samples is discussed. The Revised Plan and QAPP shall clarify this discrepancy.

This section of the QAPP also states that selection of the parameters of interest for each sampling site is based on previous site activities. This statement is too vague, does not conform to the requirements for a QAPP per N.J.A.C. 7:26E-2.2(a)v, and the previous site activities have not established a database of sufficient size to support such a proposal. The statement also contradicts Sections 3.2.2, 4.2, 4.3, 4.4, 4.5 and 4.6 of the Plan, which name specific sampling parameters for ground water. The statement shall be removed from the QAPP.

m. BI shall state the purpose of the line labeled "Development Water" on the sample Well/Boring Log form, Figure 1 of the QAPP.

8. Laboratory Data Deliverable Packages, Appendix D

Appendix D of the Plan was not provided to the NJDEP. The Revised Plan shall include all laboratory data deliverables and the electronic data deliverables as required by the TRSR, N.J.A.C. 7:26E.

9. Soil Cleanup Criteria (SCC)

The Plan cites the Department's proposed (and never promulgated) Cleanup Standards for Contaminated Sites, N.J.A.C. 7:26D. As the NJDEP has previously relayed to BI, this regulation does not exist and all reference/ mention of this citation shall be eliminated from all future documents until such time that the Department formally promulgates/adopts the regulation. In the interim, BI shall utilize the Department's SCC, which are currently utilized for soil remediation. The SCC are based on the cleanup standards contained in the proposed rule, with noted corrections due to errors identified to the Department during the comment period as well as new toxicological information obtained since the rule proposal.

10. Document Certification

The certification for the document is by Richard R. Fisette, Terminal Manager. However, the Oversight Rules, N.J.A.C. 7:26C-1.2 require that a corporate executive of at least Vice President or a duly authorized corporate representative certify each document submitted for NJDEP review. IMTT shall verify whether or not Mr. Fisette holds the appropriate title or has been duly authorized. Certification by the appropriate person or submittal of the required documentation to establish that Mr. Fisette is duly authorized shall be provided with the Revised Plan and accompany all future documents.

11. Site-wide Sewer System

With respect to the sewer system for the facility, BI shall prepare/submit a work plan containing detailed proposals and an acceptable (i.e. – accelerated/aggressive) schedule for mapping and investigating the process/storm sewer system. The schedule shall depict project milestones, timelines for various tasks, progress reporting dates, and a formal report date(s). The work plan shall propose to:

- locate all stormwater, process wastewater, and sanitary waste conveyance systems,
- identify, inspect, map, and plot all such conveyance systems on properly scaled figures,
- employ video cameras and/or alternative methods to determine/document the integrity of the systems,
- repair/replace all non-integral portions of conveyance systems that BI intends to continue using,
- bypass the non-integral portions until repair/replacement work is complete,
- decommission any systems or portions of systems that are "out of service" to eliminate their potential to act as preferential contaminant migration paths, and
- prepare/submit a comprehensive, detailed report or reports to document the satisfactory completion of the required investigation/remediation.

This site-wide sewer system work plan shall also be submitted to this office within ninety (90) calendar days from your receipt of this correspondence and include the notarized certification that is required by the Oversight Rules, N.J.A.C. 7:26C-1.2. The site will be referred to the Department's Office of Accountability and the MOA may be terminated if BI submits a deficient document or fails to meet the specified due date.

BI is also notified that the comprehensive, detailed report/reports shall:

- depict the mapped locations of the systems and all areas where the integrity of the conveyance systems is observed to be lacking (e.g. - leaks, breaks, misalignments, and/or collapses) on scaled figures,
- list all conveyance systems and non-integral areas in tabular format,
- include narrative descriptions of the non-integral areas,
- identify any area where damaged/leaking piping is discharging contamination as an AOC, and
- present conclusions/recommendations to investigate potential soil and ground water impacts at these AOCs as required by the TRSR.

Comments on the Site Investigation Report (SIR)

The SIR documents preliminary investigations and/or remedial actions that BI performed without prior approval by the NJDEP (i.e. at risk) for three areas of the site that BI designates AOCs 1-3. These efforts were prompted by construction activities at the site and an emergency cleanup of an oil spill. The SIR does not meet the minimum requirements established by the TRSR, N.J.A.C. 7:26E and is unacceptable due to the technical deficiencies and omitted information listed in the following comments.

1. Historical Information

The SIR omits the discussion of historical information in conformance to the TRSR, N.J.A.C. 7:26E-3.13. BI shall submit a Revised SIR that conforms to the TRSR.

2. Site Maps

The SIR fails to include a site map that identifies the specific locations of each of the AOCs discussed in the document. A properly scaled site map that accurately identifies and depicts the AOC locations shall be provided to the Department.

3. **AOC 1 - Yard 5, Tanks 5076/5077**

To begin, the NJDEP notes that Tank 5076 and 5077 represent separate AOCs pursuant to the regulatory definition established by the TRSR. Therefore, the NJDEP clarifies that its usage of the AOC 1 designation for these tanks in this deficiency letter is solely for ease of reference to the SIR and does not indicate the Department's acceptance of BI's designation. The NJDEP also requires that BI clarify whether or not other AOCs at the site have previously been given the designation of AOC 1. It is incumbent on BI to develop and consistently apply an AOC designation scheme that shall eliminate (and not create) any potential confusion over which AOC is being discussed in documents submitted for NJDEP review.

The SIR discusses the collection of soil samples at Tanks 5076 and 5077 on several different occasions. However, the SIR is not clear as to why this area has been singled out for a site investigation (e.g. – a planned facility upgrade, the necessary decommissioning of Tank 5067, or because BI knew of a specific problem). BI shall clarify/explain why this area was investigated, why Tank 5076 was dismantled, and what substances were stored in Tanks 5076 and 5077 (throughout their operational history). In addition, the SIR fails to discuss the rationale for the number and location of the soil borings, sampling depth intervals and analytical parameter selection. The SIR also does not identify the reason for the soil excavation. Without this very basic information, it is impossible for the NJDEP to determine whether or not the site investigation was properly conducted for AOC 1 consistent with the TRSR, N.J.A.C. 7:26E. BI shall submit a Revised SIR that contains all of the required information and include proposals to conduct soil sampling in conformance with the TRSR, N.J.A.C. 7:26E--2.1(c)2 in the Revised Plan.

As for the three geotechnical borings, B-1 was installed to a depth of 32 feet in the middle of footprint of former Tank 5076 footprint. B-2 was installed to depth of 28 feet on the footprint's northern edge and B-3 was installed to a depth of 26 feet on the footprint's southeast edge. Shallower Geoprobe® borings were performed around the perimeter of the tank near Tank 5077, to the south and between the two tanks. Review of the SIR indicates that:

- The logs for <u>all</u> of the borings performed were not provided and shall be submitted to NJDEP (see comment on Appendix B, below).

- Wet soil, indicating the depth to ground water, was not encountered above a depth of 23 feet in borings B-1 through B-3. These borings were performed in the Tank 5076 area (see Figure 2). Therefore, the depth to ground water encountered in these borings seems consistent with historic reports on the depth to ground water based on the nearest existing monitor well, MW-1. The Department also notes that the presence of a meadow mat or other confining layer above the depth to ground water was not shown in these logs. Also, elevated PID readings were detected in the shallow and deeper soils from these borings, with B-3 being the most highly impacted boring.

- Petroleum sheen was reported in the 22-24 feet split spoon sample in the log of Boring B-3 and free product was reported in the 24-26 feet split spoon sample. BI shall include proposals to delineate the extent of the free product in the Revised Plan and shall ultimately delineate/remediate the ground water contamination.

- No ground water sampling was performed in conformance with the TRSR, N.J.A.C. 7:26E-3.7. BI shall provide justification for this non-conformance or include proposals to conduct the required ground water investigation in the Revised Plan.

4. **AOC 2, Yard 6 Tank 6003**

A 20,000-gallon spill reportedly occurred on 18 February 2003 and BI conducted an emergency cleanup of free product and contaminated soil at this AOC (BI shall refer to the 1st paragraph of the comment 3, above regarding AOC designations). A series of post-excavation soil samples were also collected to verify proper cleanup of the contaminated soils.

The SIR does not indicate whether or not this discharge was reported to the NJDEP's hotline, and if so, provide the incident ID number assigned by the Department. This information shall be provided in the Revised SIR because it is required to facilitate accurate tracking/evaluation of the incident and subsequent remediation by the NJDEP.

A review of Figure 3 indicates that the post-excavation sample locations do not correspond with limits of excavation. In addition, the lines designating the limits of excavation appear to be incomplete. The Revised SIR shall clearly describe whether or not the excavation extended right up to the edge of the concrete wall and the aboveground storage tanks in the Tank 6003/6006 berm. Figure 3 shall also be modified to clearly define the limits of excavation.

The SIR states that nine samples were collected on 29 April 2003 (page 4). However, based on its review, the NJDEP questions if BI meant to state that five samples were collected. BI shall clarify.

BI shall identify the disposition of the free product and contaminated soils removed during the emergency action. All manifests/bills of lading shall be submitted to the Department. In the event that the product and/or contaminated soil are being stored at the site, BI shall conduct proper classification and disposal of the waste generated by these activities within the specified regulatory timeframes. The date the product and/or contaminated soil was removed/excavated shall serve as the date of waste generation.

According to the SIR, the storm drain inlets in the tank berm were impacted by the discharge. BI shall integrate a detailed report of the investigation and cleanout of these sewer pipes into the Revised SIR. Said report shall also include any post-remediation sample data collected to verify the adequacy of the impacted sediment/soil along with acceptable proposals to further investigate this preferential pathway pursuant to the TRSR.

5. **AOC 3, Yard 4 Railroad Extension**

The SIR discusses the collection of a series of soil samples in a section of Yard 4 where construction of a railroad siding extension is planned. However, the SIR fails to discuss the rationale for the number and location of the soil borings, sampling depth intervals and analytical parameter selection. The SIR also does not identify the reason for the soil excavation. Without this very basic information, it is impossible for the NJDEP to determine whether or not the site investigation was properly conducted for AOC 1 consistent with the TRSR, N.J.A.C. 7:26E. BI shall submit a Revised SIR that contains all of the required information and include proposals to conduct soil sampling in conformance with the TRSR, N.J.A.C. 7:26E--2.1(c)2 in the Revised Plan.

The NJDEP notes that boring locations shown on Figure 4 do not depict the corresponding boring numbers. Figure 4 shall be revised to correct this deficiency. The Department also notes that BI apparently opted to arbitrarily terminate these at-risk borings at a depth of 8 feet below ground surface. Based on its review of the boring logs, product may extend below this depth and this potential shall be further investigated (also refer to comments 4.b and 4.c on the Plan, above).

6. Recommendations

The SIR recommends that additional investigation be conducted on the contaminated soil and free product identified by BI as part of the site-wide Free Product Investigation Work Plan. However, while the NJDEP concurs with this recommendation, comments on the adequacy of any proposals cannot be generated until the technical deficiencies noted in this correspondence are addressed and BI prepares/submits the Revised Plan as required by the previous section of this deficiency letter.

In addition, the NJDEP notes that this section of the SIR confirms that BI was aware of the requirement to conduct a site-wide investigation of free product. However, as established by the preceding comments, the Plan only proposes to investigate select areas of the site.

7. Appendix B, Boring Logs

Appendix B does not contain the logs for all of the borings described in the SIR. This deficiency is unacceptable. Pursuant to the TRSR, stratigraphic logs for each soil boring, test pit, and monitor well that conform to N.J.A.C. 7:26E-3.6(a)2 shall be included in the SI Report in accordance with N.J.A.C. 7:26E-3.13(c) 4.

8. Soil Cleanup Criteria (SCC)

Refer to comment 9 on the Plan, above.

References

The following reference was mentioned in the preceding comments and is provided for BI's convenience:

Robbins, G. A., B. J. Henebry, B. M. Schmitt, F. B. Bartolomeo, A. Green and P. Zack. 1999. Evidence for MTBE in heating oil, Ground Water Monitoring and Remediation, Vol. XIX, No. 2, Spring, 1999, p. 65-69.

BI is notified that the Department is preparing a separate comment letter on the Pre-Design Investigation Work Plan for the Platty Kill Canal dated 24 April 2003. Said letter will be issued shortly. Subsequent to the issuance of this letter, oversight responsibilities for the referenced site shall be transferred to Mark Walters, Case Manager in keeping with the discussions that BI had with former Assistant Commissioner Evan Van Hook. If you have any questions regarding this deficiency letter prior to the official transfer of this case to Mr. Walters, please contact me at (609) 633-0739 or at *mike.kenney@dep.state.nj.us*.

Sincerely,

Michael S. Kenney, Case Manager
Bureau of Case Management

c: James Monkowski, Bayonne Health Department
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Bradley M. Campbell
Commissioner

MEMORANDUM

TO: MIKE KENNEY, CASE MANAGER, BCM

FROM: JOHN E. BOYER, TECHNICAL COORDINATOR, BEERA/EES

SUBJECT: REVIEW OF **SITE INVESTIGATION REPORT** (DATED JULY 2003)
BAYONNE INDUSTRIES SITE
BAYONNE, HUDSON COUNTY
JC: J010N400 AC: V65F

DATE: 21 OCTOBER 2003

As requested in your referral of 3 July 2003, a technical review has been completed on the aforementioned document prepared by Bluestone Environmental Services for the Bayonne Industries site. The Site Investigation (SI) Report documents preliminary investigation and/or remedial actions completed at three areas of the site:

- AOC 1 - Yard 5, Tanks 5076/5077
- AOC 2 - Yard 6 Tank 6003
- AOC 3 - Yard 4 Rail Road Extension

The document is NOT acceptable to BEERA due to the technical deficiencies and omitted information noted in the comments below.

Site Background

Bayonne Industries, Inc. is a warehousing operation of liquid bulk storage and petroleum products. The 200-acre site is located in the Constable Hook area of Bayonne, Hudson County, between the Exxon Bayonne Terminal, the Kill Van Kull and East 22nd Street. Historically, the site was operated by the Tidewater Oil Company as a coal terminal, refinery and petroleum liquid terminal from 1870 until 1949. Previous investigations have discovered NAPLs and chromium slag on-site. The Department and Bayonne Industries entered into a Memorandum of Agreement (MOA) on 27 May 1992.

Comments

1. Site Maps
The SI Report fails to include a site map that identifies the specific locations of each of the AOCs discussed in the document. A site map with the AOCs labeled shall be provided to the department.

2. Data Packages
The data packages associated with the soil samples collected during the SI phase were not submitted with the SI Report. Therefore, the usability of the data has not been established. It is left to the Case Manager's discretion as to the pertinence of this issue.

3. AOC 1 - Yard 5, Tanks 5076/5077
The SI Report discusses the collection of soil samples at Tanks 5076 and 5077 on several different occasions. It is unclear why this area has been singled out for a site investigation. Is it due to the aboveground storage tank upgrade? Bluestone shall clarify.

In addition, the report fails to discuss the rationale for the number and location of the borings, the depth and analytical parameters for the samples collected, or the reason for the soil excavation. Without this very basic information, it is impossible to determine whether the site investigation was properly conducted for AOC 1 consistent with the *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E).

4. AOC 2 - Yard 6, Tank 6003
On 18 February 2003, a 20,000-gallon spill originating from a leak at Tank 6003 occurred. An emergency cleanup of free product and contaminated soil was subsequently completed at this AOC. Bluestone collected a series of post-excavation soil samples to verify proper cleanup of the contaminated soils.

According to Figure 3, the location of the post-excavation samples does not correspond with limits of excavation. Clarify. In addition, the lines designating the limits of excavation appear to be incomplete. Was the excavation extended right up to the edge of the concrete wall and the aboveground storage tanks in the Tank 6003/6006 berm? Bluestone needs to modify the AOC site map (Figure 3) to clearly define the limits of excavation.

The SI Report states that nine samples were collected on 29 April 2003 (page 4). Does Bluestone mean to say five samples?

Bayonne Industries shall identify the disposition of the free product and contaminated soils removed during the emergency action. All manifests shall be submitted to the department.

According to the report, the storm drain inlets in the tank berm were impacted during the release. Bayonne Industries shall provide the department with any report of the

investigation and cleanout of these sewer pipes (as mentioned in the report) and any post-remediation samples collected from the sediments/soils.

5. AOC 3 - Yard 4, Rail Road Extension
Bluestone collected a series of soil samples in a section of Yard 4 where construction of a railroad siding extension is planned.

The report fails to discuss the rationale for the number and location of the borings, the depth and analytical parameters for the samples collected, or the reason for the soil excavation. Without this very basic information, it is impossible to determine whether the site investigation was properly conducted for AOC 3 consistent with the *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E).

6. Regulatory Overview
The SI Report (page 6) refers to the NJDEP's proposed (and never promulgated) *Cleanup Standards for Contaminated Sites* (NJAC 7:26D). This reference/citation is incorrect and must be removed here and throughout the report.

While the proposed cleanup standards were not promulgated, the Department did develop Soil Cleanup Criteria (SCC) that are currently utilized for soil remediation. These criteria are based on the cleanup standards contained in the proposed rule, with noted corrections due to errors identified to the Department during the comment period as well as new toxicological information obtained since the rule proposal.

7. Recommendations
Contaminated soils and free product were identified during the site investigation. Bayonne Industries is proposing to perform additional investigation of these AOCs as part of the sitewide Free Product Investigation Workplan. This is acceptable to BEERA once the technical deficiencies noted in this memorandum for the SI Report are resolved.

Please feel free to contact me should you have any questions. I can be reached at ☎ (609) 984-9751 or 🖷 john.boyer@dep.state.nj.us. Thank you.

JEB
My documents\word97\bayonne industries\si report.703\10.21.03

cc: Teruo Sugihara, Section Chief, BEERA/EES
Mary Hrenda, Geologist, BGWPA

BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.

Revised Site Investigation Report

Bayonne Industries, Bayonne, NJ

Prepared for:

Bayonne Industries
Bayonne, New Jersey

April 2004

B.I. Inc.

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REVISED SITE INVESTIGATION REPORT
IMTT - BAYONNE
BAYONNE, NEW JERSEY

1.0 INTRODUCTION

This Revised Site Investigation Report (SIR) is being submitted to the New Jersey Department of Environmental Protection (NJDEP), as well as a Revised Free Product Investigation Workplan (FPIWP) under separate cover, to address the NJDEP's comment letter dated January 8, 2004. This Revised SIR presents the results of site investigation activities conducted at three areas within the IMTT – Bayonne Properties located in Bayonne, New Jersey.

The activities addressed in this report are as follows:

- Yard 5 Tanks 5076/5077
- Yard 6 Tank 6003
- Yard 4 Railroad Extension

This Revised SIR is intended to provide a detailed summary of tasks performed at three areas of concern (AOCs). This SIR is provided as a summary of the work that has been performed to date and to present an approach for the continuing investigation of soil and groundwater contamination related to these AOCs. A site location map is presented as Figure 1. A site layout showing the AOCs is provided as Figure 2.

Upon agreement between IMTT and the NJDEP, this Revised SIR will be implemented in accordance with the Technical Requirements for Site Remediation, N.J.A.C. 7:26E and the Memorandum of Agreement (MOA) dated May 27, 1992.

2.0 HISTORICAL INFORMATION

The IMTT-Bayonne facility is located in the Constable Hook area of Bayonne, New Jersey. Since 1956, the site has been used by IMTT as a bulk liquid terminal providing storage

and trans-shipment services for fuel products, fuel-related products, plasticizers, and other chemicals. Liquid materials are received and shipped by marine vessels, tank trucks, railcars, and pipeline. The products are stored in large aboveground tanks surrounded by dikes providing spill containment. IMTT has been operating the facility since 1983. IMTT does not own the products stored but simply provides warehousing and transfer services. Accordingly, third parties are always strictly monitoring inventory.

ENSR Consulting and Engineering (ENSR) conducted an extensive review of the IMTT-Bayonne Site History. The Site History details the prior ownership, operations, and historical aerial photograph review. The relevant pages of this Site History were copied and are provided for your convenience in Appendix A. The complete site history can be found in the ENSR report entitled "Phase I Remedial Investigation Report Volume 1 of 4" submitted to the NJDEP in November 1996.

3.0 PHYSICAL SETTING

A Site Location Map (Figure 1) prepared from the U.S. Geological Survey 7.5 minute quadrangle map identifies the site location; local topography, surface drainage, and land use patterns. In reference to the map, the topography in the immediate site area is relatively flat, with a site elevation of approximately 8 feet to 9 feet above mean sea level. The surface water bodies closest to the site are the Kill Van Kull to the south, and New York Bay to the north and east.

The site is geologically located near the boundary between the Triassic Lowland and Manhattan Prong structural regions of the Piedmont Physiographic Province of New Jersey. The site is underlain by a stratigraphic sequence including unconsolidated sands, silts, and clays of Recent and Pleistocene age, and consolidated and weathered bedrock of Triassic and Precambrian age.

Overlying the bedrock in this area are unconsolidated glacial and post-glacial sediments. Glacial sediments likely consist of glacial till made up of varying materials and glacial outwash

sediments. Overlying the glacial materials are post-glacial sediments that include recent sand, silt, and clay; some of this clay is commonly termed "meadow mat". The recent silt and clay are reportedly of marine origin deposited during the recessional period of the Wisconsin glaciation.

Fill materials used to reclaim the area for industrial use now overlie the meadow mat. An upper, often brackish water-bearing zone exists within the fill materials.

4.0 IDENTIFYING AREAS OF CONCERN

The ENSR June 1994 approved Remedial Investigation Workplan (RIWP) Section 4.0 for the IMTT site, describes an approach to identifying Areas of Concern (AOCs). The approved method initially identified nine areas that were subdivided into the historic "yards" used at the facility today (with some numbers overlapping more recently due to the purchase of the Exxon facility). Identification of specific AOCs within the yards is called for in the RIWP. The yard delineation is shown on Figure 2.

In the ENSR RIWP, the delineation of an AOC within each yard include free product, spills, USTs, transformers, chromium areas, septic tanks, etc. Some AOCs have already been identified. Additional AOCs will be identified based on future investigative and remedial activities.

Using the criteria for AOC labeling, the three areas of activity presented in this Revised SI are referred to as:

AOC-Y5-ASTS 5076/5077

AOC-Y6-AST 6003

AOC-Y4-RRE

5.0 TECHNICAL OVERVIEW

During routine operation and maintenance activities at the IMTT-Bayonne Properties, two AOCs were identified, investigated, and are being reported to the NJDEP. In addition, one AOC has been identified associated with a product release from a damaged valve.

5.1 AOC-Y5-ASTS 5076/5077

AOC-Y5-AST 5076/5077 was identified during upgrade activities that involved the installation of an impermeable geosynthetic liner for the containment area and increasing the secondary containment for the Yard 5 area. Impacted soils were identified and approximately 5,000 cubic yards of soil was excavated. Post excavation soil sampling results indicate the presence of Total Petroleum Hydrocarbons (TPHCs) above acceptable levels. In addition, free product was observed on the water-table. As such, this AOC is being incorporated into the Revised Free-Product Investigation Workplan (FPIWP) being submitted to the NJDEP in March 2004.

5.1.1 Tank 5077

Soil sample analytical results show that arsenic was detected above the NJDEP Non Residential Direct Contact (NRDC) Soil Cleanup Criteria (SCC) in samples GP-2B, GP-4A (0 to 2 feet) and GP-5A (0 to 4 feet). Arsenic was detected at 32.6, 26.9 and 23.9 milligrams per kilogram (mg/kg) in samples GP-2B, GP-4A and GP-5A, respectively. The NRDC SCC for arsenic is 20 mg/kg.

Sample GP-1B exhibited a benzene concentration of 1.12 mg/kg, which exceeds the Impact to Ground Water (IGW) SCC of 1 mg/kg for benzene. Sample GP-4B exhibited a TPHC concentration of 12,900 mg/kg and a total VOC concentration of 42.5 mg/kg, which exceeds the health based criteria for total organic contaminants of 10,000 mg/kg. Table 1 provides a summary of detectable results for analyzes performed.

5.1.2 Tank 5076

The geotechnical boring logs for the three soil borings are provided in Appendix B. The total depths of the soil borings below ground surface (bgs) were:

B1 = 32 feet

B2 = 26.5 feet

B3 = 25.5 feet

Based on split spoon soil samples, groundwater was encountered in the borings at:

B1 = 28 feet bgs

B2 = 26 feet bgs

B3 = 23 feet bgs.

A distinct clay layer was not found below the water table and there was no need for the installation of casing in the borings. The following was encountered in the borings:

- Soil type varied between the borings with boring B1, the center location, consisting mostly of sands while B2 and B3 consisted mostly of silt and clays.
- The soils did not exhibit layering, grain size sorting, or other depositional characteristics indicating that the soils are fill, and not naturally occurring. A clear distinction between the fill and undisturbed natural material is not as evident as in the southern portion of the facility.
- The clays and silt encountered also contained sand, gravel, and rock fragments. Further indicating that these materials are fill.
- At the depth of and below the top of groundwater in each boring, clay was not present.
- PID readings and visual inspection of the samples from B1 did not exhibit evidence of petroleum impact.
- The samples collected at 2 to 4 feet bgs and 6 to 10 feet bgs intervals in boring B2, exhibited elevated PID readings, black staining and petroleum odor. The samples at the 2 to 4 feet bgs, 6 to 16 feet bgs intervals in boring B3, exhibited elevated PID readings and

petroleum odor.

- The groundwater recovered from the soils in the split spoons from B3 at 22 to 25.5 feet bgs contained petroleum sheen to some product.

Soil sample analytical results show that arsenic was detected in sample Y5-5076-5B at a concentration of 399 mg/kg, which is above the NJDEP NRDC SCC of 20 mg/kg.

In sample YS-5076-4B, barium was found at a concentration of 1,770 mg/kg. Lead was found in this sample at a concentration of 7,240 mg/kg, which exceeds the NRDC SCC of 600 mg/kg.

Total organic contaminants concentrations in samples YS-5076 4B (0 to 4 feet bgs) and 5B (0 to 4 feet bgs) were 122,057 and 26,315 mg/kg, respectively. These results exceed the health-based criteria for total organic contaminants of 10,000 mg/kg. Table 2 provides a summary of detectable results for analyzes of the January 8, 2003 samples performed.

Total organic contaminants concentrations in samples GP-PR1 (0.5 to 1.5 feet bgs), PR2 (0.5 to 1.5 feet bgs), T1 (1 to 1.5 feet bgs), and T2 (1.2 to 1.7 feet bgs) were 45,349 mg/kg, 11,813 mg/kg, 26,009 mg/kg, and 21,247 mg/kg, respectively. These results exceed the health-based criteria for total organic contaminants of 10,000 mg/kg. No VOC constituents of concern were detected above NJDEP SCC. Table 3 provides a summary of detectable results for analyzes of the January 17, 2003 samples performed.

5.2 AOC-Y6-AST 6003

AOC-Y6-AST 6003 was identified on Tuesday February 18, 2003, as the result of a leak originating from a damaged pressure relief valve on Tank 6003. This release was reported to the NJDEP Hotline on February 18, 2003 and was issued case number 03-02-18-1725-47. An estimated 20,000 gallons of number six fuel oil had discharged to ground surface from the damaged valve. Vacuum trucks were used to collect approximately 19,000 gallons of oil and

water.

Approximately 30 cubic yards of soils were excavated. Post excavation soil sample analytical results indicated the presence of TPHs above acceptable levels. Further investigation of this AOC is being incorporated into the Revised FPIWP being submitted to the NJDEP in March 2004.

Soil sample analytical results show that three samples contained concentrations for TPHC above NJDEP SCC. The remaining sixteen samples are below 10,000 mg/kg TPHC. Based on these TPHC results and the type of product, contingency PAHs analyses were run on five samples (25% of the samples over 10,000 TPHC) with the highest TPHC results. These analyses showed contaminant concentrations exceeding the NRDC SCC in samples PE-5 and PE-6 for Benzo(a)pyrene. Total organic contaminants concentrations exceed the health based SCC of 10,000 ppm in three samples (PE-6, PE-10, and PE-15). Table 4 provides a summary of detectable results for the analyses performed.

5.3 AOC-Y4-RRE

AOC-Y4-RRE was identified during the installation of rail sidings for the storage of rail cars. The rail sidings were installed adjacent to the railroad lines existing in Yard 4. During the installation process, a 4-inch diameter pipe was found and impacted soils were identified. Upon further investigation, it was determined that the 4-inch diameter pipe had been previously capped and abandoned. IMTT decided to remove the pipe. The pipe was opened and a petroleum product was detected inside the pipe. The product was removed from the pipe and the pipe was removed from the area. Post excavation soil sample analytical results indicated the presence of TPHs above acceptable levels. In addition, free product was observed on the water-table. As such, this AOC is being incorporated into the Revised FPIWP being submitted to the NJDEP in March 2004.

The results of the sampling event are:

- The area of soil investigation exhibited visual evidence of petroleum contamination.
- Free product was visually identified on groundwater in all borings except GP-1. Soils in GP-1 did exhibit black staining and free product may also be present at this location.
- Groundwater was encountered as shallow as two feet bgs.
- Five samples, GP-1A, GP-3B, GP-4B, GP-6B, and GP-7A, exhibited concentrations above the NJDEP SCC for total organic contaminants concentration of 10,000 mg/kg.

One soil sample, GP-1A, exhibited a concentration for arsenic of 47.5 mg/kg that exceeded the NJDEP NRDC of 20 mg/kg. No other RCRA metal compounds were found that exceeded of NJDEP SCC. The presence of arsenic is probably due to the historical fill used throughout the area. Table 5 provides a summary of detectable results for the RCRA metals analyses performed.

Samples GP-1A, GP-3B, GP-4B, GP-6B, and GP-7A exhibited total organic contaminants concentrations greater than 10,000 mg/kg the NJDEP health-based criteria for total organic contaminants.

VOC and SVOC compounds that were found above NJDEP NRDC SCC are:

- Benzene in sample GP-3B.
- Benzo [a] pyrene in samples GP-3B, GP-4B, GP-6B, and GP-7A.
- Benzo [a] anthracene in sample GP-6B.

Table 5 provides a summary of detectable results for TPHC, VOCs +10 and SVOC +15 analyzes performed.

5.4 Sample Reliability

All samples were collected in accordance with the NJDEP sampling requirements, in laboratory-supplied bottles. All samples were submitted to the laboratory under a chain of custody. The laboratory conformance summary indicated a conformance with the laboratory Quality Assurance/Quality Control Requirements for sampling receipt and handling. All

analyses, holding times and sample requirements were in compliance, and are documented in the laboratory conformance summary.

6.0 FINDINGS

6.1 AOC-Y5-ASTS 5076/5077

Tanks 5076 and 5077 were scheduled for demolition to allow for the construction of tank upgrades including installation of an impermeable geosynthetic liner for the containment area and increasing the secondary containment for this area. Upon completion of these upgrades, ASTs 5076 and 5077 were scheduled to be reconstructed. Tanks 5076 and 5077 were and are used for the storage of gasoline.

Prior to initiating the upgrade activities, six Geoprobe soil borings were installed around Tank 5077. A summary results table and sample locations map were provided in the 2nd Quarter 2002 Status Report for the West Side Water Front.

Prior to replacement tank construction and the installation of the containment liner in the area of Tank 5076, thirteen soil borings were installed during two sampling episodes. Tank 5076 was demolished and removed prior to the two soil boring programs. The first sampling event occurred before excavation for the containment liner was undertaken. The second sampling event was performed when excavation to a rough grade was complete.

6.1.1 Tank 5077 Geoprobe® Soil Boring Investigation

On August 6, 2002, six Geoprobe® soil borings were installed around Tank 5077 to characterize the shallow soils and determine worker health and safety protection. Soil samples were collected continuously from ground surface to 4 feet below ground surface (bgs) in five locations within the containment area. One location (GP-5), was advanced to 12 feet bgs into the existing southwest containment berm. The berm has since been removed as part of the

construction and a new berm constructed. Figure 3 provides the locations of these soil borings. A licensed surveyor recorded the sample locations of the samples.

The samples were visually inspected, screened with a PID, and classified by a Bluestone geologist. The soil sample interval showing the highest PID reading or evidence of impact was selected for laboratory analysis. For the five borings advanced to 4 feet bgs on the containment area floor, soil samples were submitted for laboratory analysis from the 0 to 2 feet bgs and 2 to 4 feet bgs intervals in each boring. In the deeper boring (GP-5), samples from the 0 to 4 feet bgs, 4 to 8 feet bgs, and 8 to 12 feet bgs intervals were submitted for analysis. A total of 13 soil samples from the Tank 5077 containment area were submitted to a New Jersey certified laboratory to be analyzed for RCRA metals, TPHC, and VOCs + 10 and MTBE/TBA.

The VOCs +10 sample was collected first in each sample that exhibited the highest PID reading in each sample interval. RCRA metals and TPHC soil samples were then collected from the area of this same elevated PID zone.

All soil samples were submitted to Acutest Laboratories (NJDEP # 12129) of Dayton, New Jersey (Acutest) for analysis for VOCs +10 by U.S. Environmental Protection Agency (USEPA) Method 8280B, RCRA metals by USEPA methodologies 6010B and 7471A for mercury, and TPHC by USEPA methodology 418.1. Copies of chain of custody, laboratory analysis results, quality assurance data report, and laboratory authentication statements for the soil samples were provided in the April 2003 SIR.

6.1.2 Tank 5076 Geotechnical Investigation

On January 6, 2003, RMPS Consulting Engineers (RMPS) installed three geotechnical soil borings in the area of former Tank 5076. Tank 5076 was demolished to allow for the construction of a new tank at the location and the installation of an impermeable liner. RMPS installed the borings to gain geotechnical information about the subsurface soils (type and structural integrity) at the location prior to the re-construction of Tank 5076. Bluestone was on-

site to supervise the installation of borings, screen the borings for environmental impacts, and "case off" the meadow mat clay if encountered. Boring locations are shown on Figure 3.

Boring B1 was located at the approximate center of former Tank 5076, B2 along the north side of the former tank and B3 along the southeast side of the former tank in the vicinity of product lines attached to the tank.

6.1.3 Tank 5076 Geoprobe® Soil Boring Investigations (Pre-Construction)

On January 8, 2003, five soil borings were advanced and soil samples were collected continuously to 4 feet bgs to characterize the soils prior to excavation for expansion of containment area for Tank 5076. These five samples were visually inspected, classified, and screened with a PID by a Bluestone geologist. One soil sample from each boring was submitted for laboratory analysis for RCRA metals, TPHC, and VOCs +10 from the interval that exhibited the greatest petroleum impact. Figure 3 provides the approximate locations of these soil borings and the soil boring logs are provided as Appendix B. The laboratory report was provided in the April 2003 SIR.

6.1.4 Tank 5076 Geoprobe® Soil Boring Investigations (Post-Excavation)

On January 17, 2003, a soil boring program was performed in the Tank 5076 containment area after excavation down to rough grade was completed. Soil samples were collected continuously to 4 feet bgs from eight locations. Soils were visually inspected, classified and screened with a PID by a Bluestone geologist. One soil sample from each boring was submitted for laboratory analysis from the interval that exhibited the greatest petroleum impact. Figure 3 provides the approximate locations of these soil borings.

Eight soil samples from the Tank 5076 boring programs were selected and submitted to APL for analysis. Based on the current and historic product storage in the ASTs (gasoline), soil samples were analyzed for VOCs +10 by USEPA Method 8280B, RCRA metals by USEPA

methodologies 6010B and 7471A for mercury, and TPHC by USEPA methodology 418.1. Copies of chain of custody, analytical results, quality assurance data report, and laboratory authentication statements for the soil samples were provided in April 2003 SIR.

6.2 AOC-Y6-AST 6003

On Tuesday February 18, 2003, a leak was discovered originating from a damaged pressure relief valve on Tank 6003. This release was reported to the NJDEP Hotline on February 18, 2003 and was issued case number 03-02-18-1725-47. An estimated 20,000 gallons of number six fuel oil had discharged to ground surface from the damaged valve. Vacuum trucks were used to collect approximately 19,000 gallons of oil and water. The remaining oil solidified due to the ambient temperature. IMTT began recovery activities using heavy equipment.

On March 26, 2003, Bluestone was present at the site to observe ongoing cleanup and excavation activities already underway and to collect characterization soil samples. Oil-impacted soils were observed between Tank 6003 and Tank 6006, and in the dike area on the east side of both tanks. The footprint of the area impacted by the release is irregular in shape, covering an area of approximately 7,000 square feet as shown on Figure 4.

As an emergency cleanup, free product and impacted surface soils were cleaned up on the eastern side of the two tanks and extending between the tanks to their mid point. Oil recovery and surface excavation work continued between the tanks toward the western portion of the spill. Heavy machinery was used to remove saturated soils in accessible areas. Hand digging was conducted in and around the aboveground piping network that runs between the two tanks. Additional active pipelines, stairways, and concrete footings near the west side of the tanks interfered with removal efforts due to their proximity and number in a tight area.

Excavated soils were removed from the dike area and stockpiled in Yard 6 just north of the access road. Approximately 30 cubic yards of stockpiled oily soil is currently staged

there. All stockpiled soils were staged on and covered with plastic sheeting.

On March 26, 2003 and April 29, 2003, post-excavation samples were collected. Sampling locations are shown on Figure 4. The laboratory report was provided in the April 2003 SIR.

On March 26, 2003, Bluestone collected fourteen soil samples from the eastern portion of the spill area. The area from between the tanks and west was not sampled at this time due to ongoing cleanup effort. Seven sidewall samples were collected at the reported edge of the spill footprint, and seven bottom samples were collected within the excavated area at a depth of 0 to 6 inches below the original surface (see Figure 4).

On April 29, 2003, Bluestone returned to the site to collect post excavation soil samples from the western portion of the spill site. Nine soil samples were collected. Four of the soil samples were taken from the area between the tanks (bottom samples, 0 to 6 inches below the original surface), and one sample was collected from the horizontal western limit of the excavation work near Tank 6006 (sidewall sample, 0 to 6 inches deep). The area near the west side of Tank 6003 exhibited surface impacts remaining around the physical obstructions mentioned above.

All samples were collected by first removing the six to twelve inches of stone backfill that had been placed over the excavated areas prior to sampling. The samples were taken from the hard packed clay that had not been disturbed by the surface excavation activities.

The on-site Bluestone geologist visually inspected the samples. All nineteen post-excavation soil samples were submitted for laboratory analysis for TPHC, and contingency analyses for PAHs, as per NJDEP requirements. Samples were submitted to APL. TPHC analysis was by USEPA methodology 418.1; PAHs analysis was by method SW 846 8270C. The laboratory report was provided in the April 2003 SIR.

6.3 AOC-Y4-RRE

On April 14, 2003, Bluestone installed soil borings and collected environmental soil samples for analysis in the area of the planned railroad siding extension construction. The purpose of the soil boring investigation was to characterize the soil beneath the planned construction area to determine the necessary level of health and safety procedures during work in the area.

Prior to initiation of construction in Yard 4, eight soil borings were installed within the area of the planned railroad siding installation to characterize the soils to determine worker health and safety protection. Soil samples were collected continuously from ground surface to 8 feet bgs or refusal at the eight boring locations. Samples collected were from the 0 to 4 foot and 4 to 8 foot intervals in all borings. Where refusal was encountered at depth, the boring location was moved slightly and another attempt was made to penetrate to eight feet bgs. Figure 5 provides the approximate locations of these soil borings.

The samples were visually inspected, classified, and screened with a PID by Bluestone. Boring logs describing the soils encountered and PID readings are provided in Appendix B. In all eight borings, soil samples were submitted for laboratory analysis for RCRA metals from the upper four feet of the boring, representing the top portion of the soil profile encountered in the first sample tube.

Approximately 20 cubic yards of soil was removed associated with the construction of the planned railroad siding extension. These soils are stockpile in Yard 4 near the original excavation and are on and covered with plastic sheeting.

In all of the borings, the section of each sample interval that exhibited the highest PID reading was submitted for TPHC analysis. The interval that exhibited the highest PID reading for each boring was also submitted for laboratory analysis for VOCs+10 and semi-volatile organic compounds (SVOCs) with a fifteen compound library search (+15).

All samples from the boring program were submitted to APL. VOCs +10 analysis was by USEPA Method 8260B, SVOCs +15 analysis was by USEPA Method 8270C, RCRA metals by USEPA methodologies 6010B and 7471A for mercury, and TPHC by QAM-025. Copies of the laboratory report were provided in the April 2003 SIR.

7.0 CONCLUSIONS

The conclusions documented in the following sections are discussed individually by area of concern and are based on the initial response actions, interim remedial actions, and site investigation described above.

7.1 AOC-Y5-ASTS 5076/5077

The results of the sampling event are:

- The analyses of the soil samples collected exhibited evidence of contamination above NJDEP NRDC SCC for arsenic.
- Benzene was detected in excess of the IGW SCC in sample GP-1B.
- TPHC and VOC concentrations exceed the health-based criteria in sample GP-4B.
- Barium and lead were detected in concentrations exceeding the NRDC.

7.2 AOC-Y6-AST 6003

The results of the sampling event are:

- The analyses of the soil samples collected exhibited evidence of contamination above NJDEP SCC for TPHC, and PAHs.
- Additional remediation of the soils in limited areas should proceed in order to comply with the Technical Requirements for Site Remediation.

The response and subsequent cleanup activities were successful in eliminating the immediate source of the contamination and in removing a majority of the surface oil, and as much of the severely impacted soils as practicable at the time of excavation. Based on the underlying soil conditions, it does not appear that the release has, or will reach groundwater. Visual inspection does indicate that there is an area of impact (surface oil present in the western portion of the dike) that will require additional cleanup as mentioned above.

Analytical results show that impacted soils remain in localized areas near sample locations PE-5, PE-6, PE-10, and PE-15. Complete remediation of the surface soils may require additional removal of shallow surface soils in order to meet NJDEP SCC for TPHC and total organic contaminants. Storm drain inlets in the dike area were also impacted by the release. The sewer lines were subsequently investigated and cleaned.

7.3 AOC-Y4-RRE

The results of the laboratory analyses showed that five samples exhibited a concentration above the NJDEP SCC for total organic contaminants concentration of 10,000 mg/kg. Four of these samples also exceeded the NRDC SCC. The highest PID readings were below the top of the water table, and consequently the sampled intervals were also below the top of the water table. Due to the presence of free product found in the area, soil will remain under the siding at least until the free product is removed.

8.0 RECOMENDATIONS

The following are recommendations for additional investigation at the site, to address the known impacts to soil and groundwater.

In May 2003, Bluestone Environmental submitted a proposed Free Product Investigation Workplan (FPIWP) on behalf on IMTT to the NJDEP to conduct a site-wide investigation of free product at the facility. On January 8, 2004, IMTT received a comment letter from the NJDEP.

IMTT has revised the FPIWP and submitted it to the NJDEP in March 2004. The revised FPIWP proposed extensive fieldwork including monitoring well installation, soil sampling, and groundwater sampling be conducted in the three AOCs identified in this Revised SIR. As such, it is proposed that further investigation of the AOCs identified in this Revised SI be performed under the proposed site-wide FPIWP revised and submitted to the NJDEP in March 2004.

IMTT proposes to conduct delineation activities under the Revised FPIWP. IMTT contends that to avoid confusion of multiple phases (i.e. soil, sewer, groundwater) of investigation localized throughout the site, comprehensive site-wide plans (i.e. free product, sewer, soil) be prioritized and implemented. Activity-specific findings would be documented and reported prior to transferring further necessary tasks to the appropriate, wider scope investigation. It is important to note that IMTT intends to address additional media in subsequent phases and programs under subsequent separate workplans designed for those purposes.

Each area is covered under an area identified in the FPIWP. The cross-references are provided below:

Revised SIR	**Revised Free Product Investigation Area**
AOC-Y5-ASTS 5076/5077	Tanks 5076 and 5077 Area
AOC-Y6-AST 6003	Tank 6006 and 6003 Area
AOC-Y4-RRE	Yard 4

9.0 CERTIFICATIONS - N.J.A.C. 7:26-1.2 et. seq.

Any person making a submission to the Department required by this chapter and pursuant to N.J.A.C. 7:26E, shall include the following signature and notarized certification, for each technical submittal. Additionally, the certification shall indicate the case name and address, case number, type of documents submitted, e.g. Remedial Action Report, for each technical submittal.

TYPE OF DOCUMENT Revised Site Investigation Report

CASE NAME IMTT-Bayonne

CASE ADDRESS 250 East 22nd St., Bayonne, New Jersey

CASE NUMBER 01-03-07-1649-03

"I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge. I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement that I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

PRINTED NAME Richard R. Fisette TITLE Vice President

SIGNATURE [signature] DATE 3-24-04

Sworn to and subscribed before me
This 24th Day of March 2004

[signature]
NOTARY PUBLIC OF NEW JERSEY

JEANNE C. HARTNETT
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires 02-11-09

TABLE 1

Detectable VOCs, Petroleum Hydrocarbons and RCRA Metals Concentrations
Geoprobe TM Soil Boring Soil Samples
AOC-Y5-AST 5077

Sample ID	GP-1A	GP-1B	GP-2A	GP-2B	GP-3A	GP-3B	GP-4A	GP-4B	GP-5A	GP-5B	GP-5C	GP-6A	GP-6B	NJDEP	NJDEP
Sampling Date	08/06/02	08/06/02	08/06/02	08/06/02	08/06/02	08/06/02	08/06/02	08/06/02	08/06/02	08/06/02	08/06/02	08/06/02	08/06/02	NRDCSCC	IGWSCC
Depth Interval (In Feet)	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-4	4-8	8-12	0-2	2-4		
Laboratory ID	N19663-1	N19663-2	N19663-3	N19663-4	N19663-5	N19663-6	N19663-7	N19663-8	N19663-9	N19663-10	N19663-14	N19663-11	N19663-12		
Volatile Organic Compounds (In ug/kg)															
Benzene		*1,120*									209		981	13,000	1,000
Toluene											174			1,000,000	500,000
Ethylbenzene		4,030								683	401		3,450	1,000,000	100,000
Xylene (total)		844								1,400	996		738	1,000,000	67,000
Total VOCs TICs	15,300	323,000	0	0	51,200	76,300	101,000	42,500	92,900	112,300	303,000	1,300	267,000		
Total VOCs	15,300	328,994	0	0	51,200	76,300	101,000	42,500	92,900	114,383	304,780	1,300	272,169	1,000,000	1,000,000
Petroleum Hydrocarbons (In mg/kg)	3,330	2,830	167	1,670	4,630	6,050	9,440	12,900	1,030	3,310	3,640	2,990	6,110		
Total Organic Contaminants (In mg/kg)	3,345	3,159	167	1,670	4,681	6,126	9,541	12,943	1,123	3,424	3,945	2,991	6,382	10,000 *	10,000 *
RCRA Metals (In mg/kg)															
Arsenic	4.9	4.7	11.2	3.4	32.6	5.8	26.9	3.3	23.9	14.7	6.2	5.4	2.7	20	
Barium	40.2	41.1	65.8	53.9	87.6	44.5	74	<21	99.8	28.1	<22	37.7	<22	47,000	
Chromium	17.9	16.8	28.2	10.3	37.3	16.6	35.3	7.3	66.8	8.9	9.2	16.2	10.4	6,100 **	
Lead	14.8	11.2	64.7	5.2	303	11.5	257	3.3	330	79	59.9	345	5.4	600	
Mercury	<0.035	<0.033	0.074	<0.033	0.83	<0.032	0.36	<0.035	0.38	0.077	<0.034	0.14	<0.033	270	
Selenium	<1.1	<1.1	<1.1	<1.0	<1.1	<1.1	<1.1	<1.1	1.6	<1.1	<1.1	<1.1	<1.1	3,100	
Silver	<1.1	<1.1	<1.1	<1.0	14.2	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	4,100	

NOTES:

ug/kg	Micrograms per kilogram
mg/kg	Milligrams per kilogram
blank or <	Not detected above limits of methodology
NRDC	NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)
IGWSCC	NJDEP Impact to Ground Water Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)
TICs	Tentatively Identified Compounds
32.6	Concentration exceeds Non-RDC Soil Cleanup Criteria
32.6	Concentration exceeds IGW Soil Cleanup Criteria
*	Health Based criterion for total organic contaminants of 10,000 mg/kg
**	Criteria for hexavalent Chromium - criterion based on inhalation exposure pathway

TABLE 2

Detectable VOCs, Petroleum Hydrocarbons and RCRA Metals
Geoprobe TM Soil Boring Soil Samples - January 8, 2003
Yard 5 Tank 5076

Sample ID	YS-5076-1B	YS-5076-2B	YS-5076-3B	YS-5076-4B	YS-5076-5B	NJDEP	NJDEP
Sampling Date	01/08/03	01/08/03	01/08/03	01/08/03	01/08/03	NRDCSCC	IGWSCC
Depth Interval (In Feet)	0-3	0-3	0-4	0-4	0-4		
Laboratory ID	23010338-001	23010338-002	23010338-003	23010338-004	23010338-005		
Volatile Organic Compounds (In ug/kg)							
Methyl tert-Butyl Ether				320			3,100
Benzene				354	357	13,000	1,000
Toluene					367	1,000,000	500,000
Ethylbenzene				138 J	252	1,000,000	100,000
Xylene (total)				440	842	1,000,000	67,000
Naphthalene				1,510	1,310	4,200,000	100,000
Total VOCs TICs	1,550	1,210	84,320	54,210	111,440		
Total VOCs	1,550	1,210	84,320	56,972	114,568	1,000,000	1,000,000
Petroleum Hydrocarbons (In mg/kg)	2,160		8,700	122,000	26,200		
Total Organic Contaminants (In mg/kg)	2,162	1.2	8,784	122,057	26,316	10,000 *	10,000 *
RCRA Metals (In mg/kg)							
Arsenic	2.87	2.26	2.09	13.4	399	20	
Barium	46.5	81.7	59.1	1,770	104	47,000	
Cadmium	<0.09	<0.08	<0.1	<0.09	3.34	100	
Chromium	12.2	11.4	10.4	245	9.12	6,100 **	
Lead	5.39	16.6	12.5	7,240	652	600	
Mercury	0.024	<0.021	0.024	0.215	3	270	
Silver	<1.31	<1.18	<1.55	5.37	<1.83	4,100	

NOTES:

ug/kg	Micrograms per kilogram	TICs	Tentatively Identified Compounds
mg/kg	Milligrams per kilogram	32.6	Concentration exceeds Non-RDC Soil Cleanup Criteria
blank or <	Not detected above limits of methodology	*32.6*	Concentration exceeds IGW Soil Cleanup Criteria
J	Indicates concentration estimated below the limits of the methodology	*	Health Based criterion for total organic contaminants of 10,000 mg/kg
NRDC	NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)	**	Criteria for hexavalent Chromium - criterion based on inhalation expos
IGWSCC	NJDEP Impact to Ground Water Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)		

TABLE 5

Detectable VOCs and Petroleum Hydrocarbons
Geoprobe TM Soil Boring Soil Samples
Collected January 17, 2003 - After Grading Completed
Yard 5 Tank 5076

Sample ID	GP-PR1	GP-PR2	GP-PR3	GP-T1	GP-T2	GP-T3	GP-M1	GP-M2	NJDEP	NJDEP
Sampling Date	01/17/03	01/17/03	01/17/03	01/17/03	01/17/03	01/17/03	01/17/03	01/17/03	NRDCSCC	IGWSCC
Depth Interval (In Feet)	0.5'-1.5'	0.5'-1.5'	0.5'-1.0'	1.0'-1.5'	1.2'-1.7'	0.5'-0.7'	1.5'-2.0'	1.5'-2.0'		
Laboratory ID	23010647-001	23010647-002	23010647-003	23010647-004	23010647-005	23010647-006	23010647-007	23010647-008		
Volatile Organic Compounds (In ug/kg)										
Methyl tert-Butyl Ether										3,100
Benzene						559			13,000	1,000
Toluene						173 J			1,000,000	500,000
Ethylbenzene						1,570			1,000,000	100,000
Xylene (total)	366				226	2,417			1,000,000	67,000
Naphthalene	680		1,610		663	281 J			4,200,000	100,000
Total VOCs TICs	48,360	13,217	34,190	9,450	45,830	25,730				
Total VOCs	49,406	13,217	35,800	9,450	46,719	30,730	0	0	1,000,000	1,000,000
Petroleum Hydrocarbons (In mg/kg)	45,300	11,800	8,770	26,000	21,200	8,650	216	1,440		
Total Organic Contaminants (In mg/kg)	***46,349***	***11,813***	8,806	***26,009***	***21,247***	8,681	216	1,440	10,000	10,000

NOTES:

ug/kg	Micrograms per kilogram
mg/kg	Milligrams per kilogram
blank	Not detected above limits of methodology
J	Indicates concentration is estimated below the limits of the methodology
NRDC	NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)
IGWSCC	NJDEP Impact to Ground Water Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)

TICs	Tentatively Identified Compounds
32.6	Concentration exceeds Non-RDC Soil Cleanup Criteria
32.6	Concentration exceeds IGW Soil Cleanup Criteria
*	Health Based criterion for total organic contaminants of 10,000 mg/kg
**	Criteria for hexavalent Chromium - criterion based on inhalation exposure pathway

TABLE 4
Detectable Semi-VOCs (PAHs), Petroleum Hydrocarbons Concentrations
Post Excavation Soil Boring Soil Samples
AOC-Y6-AST 6003

Sample ID Sampling Date Laboratory ID	PE-1 03/26/03 23031107-001	PE-2 03/26/03 23031107-002	PE-3 03/26/03 23031107-003	PE-4 03/26/03 23031107-004	PE-5 03/26/03 23031107-005	PE-6 03/26/03 23031107-006	PE-7 03/26/03 23031107-007	PE-8 03/26/03 23031107-008	PE-9 03/26/03 23031107-009	PE-10 03/26/03 23031107-010	NJDEP NRDCSCC	NJDEP IGWSCC
Semi-Volatile Organic Compounds (In ug/kg)												
Naphthalene	NA	NA	NA	NA		3190	NA	NA			4,200,000	100,000
Acenaphthene	"	"	"	"			"	"			10,000,000	100,000
Fluorene	"	"	"	"			"	"			10,000,000	100,000
Phenanthrene	"	"	"	"	709	8,580	"	"				
Anthracene	"	"	"	"			"	"			10,000,000	100,000
Fluoranthene	"	"	"	"	308		"	"			10,000,000	100,000
Pyrene	"	"	"	"	743	5,170	"	"	337	458	10,000,000	100,000
Benzo[a]anthracene	"	"	"	"			"	"			4,000	500,000
Chrysene	"	"	"	"	1,280	10,000	"	"	383	608	40,000	500,000
Benzo[b]fluoranthene	"	"	"	"	420	3,260	"	"			4,000	50,000
Benzo[k]fluoranthene	"	"	"	"	375	3,670	"	"			4,000	500,000
Benzo[a]pyrene	"	"	"	"	1,120	10,200	"	"	322	326	660	100,000
Dibenzo[a,h]anthracene	"	"	"	"	249		"	"			4,000	500,000
Benzo[g,h,i]perylene	"	"	"	"	279	2,090	"	"		289		
Total Semi-VOCs	NA	NA	NA	NA	5,483	46,160	NA	NA	1,042	1,681		
Petroleum Hydrocarbons (In mg/kg)	4,370	4,820	1,820	4,380	9,310	15,200	3,420	1,630	9,160	14,100		
Total Organic Contaminants (In mg/kg)	4,370	4,820	1,820	4,380	9,315	15,246	3,420	1,630	9,161	14,102	10,000 *	10,000 *

NOTES:

ug/kg Micrograms per kilogram

mg/kg Milligrams per kilogram

blank or < Not detected above limits of methodology

NRDC NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)

IGWSCC NJDEP Impact to Ground Water Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)

10,200 Concentration exceeds Non-RDC Soil Cleanup Criteria

* Health Based criterion for total organic contaminants of 10,000 mg/kg

NA Not analyzed

TABLE 4
Detectable Semi-VOCs (PAHs), Petroleum Hydrocarbons Concentrations
Post Excavation Soil Boring Soil Samples
AOC-Y6-AST 6003

Sample ID Sampling Date Laboratory ID	PE-11 03/26/03 23031107-011	PE-12 03/26/03 23031107-012	PE-13 03/26/03 23031107-013	PE-14 03/26/03 23031107-014	PE-15 04/29/03 23041271-001	PE-16 04/29/03 23041271-002	PE-17 04/29/03 23041271-003	PE-18 04/29/03 23041271-004	PE-19 04/29/03 23041271-005	NJDEP NRDCSCC	NJDEP IGWSCC
Semi-Volatile Organic Compounds (In ug/kg)											
Naphthalene	NA	NA	NA	NA		NA	NA	NA	40	4,200,000	100,000
Acenaphthene	"	"	"	"		"	"	"	44	10,000,000	100,000
Fluorene	"	"	"	"	2,300	"	"	"	47	10,000,000	100,000
Phenanthrene	"	"	"	"	4,720	"	"	"	415		
Anthracene	"	"	"	"		"	"	"	114	10,000,000	100,000
Fluoranthene	"	"	"	"		"	"	"	509	10,000,000	100,000
Pyrene	"	"	"	"	1,650	"	"	"	440	10,000,000	100,000
Benzo[a]anthracene	"	"	"	"		"	"	"		4,000	500,000
Chrysene	"	"	"	"	1,290	"	"	"	350	40,000	500,000
Benzo[b]fluoranthene	"	"	"	"		"	"	"	265	4,000	50,000
Benzo[k]fluoranthene	"	"	"	"		"	"	"	150	4,000	500,000
Benzo[a]pyrene	"	"	"	"		"	"	"	291	660	100,000
Dibenzo[a,h]anthracene	"	"	"	"		"	"	"		4,000	500,000
Indeno(1,2,3-cd)pyrene	"	"	"	"		"	"	"	100	4,000	500,000
Benzo[g,h,i]perylene	"	"	"	"		"	"	"	129		
Total Semi-VOCs	NA	NA	NA	NA	9,960	NA	NA	NA	12,854		
Petroleum Hydrocarbons (In mg/kg)	1,630	230	4,450	1,030	27,100	953	2,330	2,340	5,130		
Total Organic Contaminants (In mg/kg)	1,630	230	4,450	1,030	27,110	953	2,330	2,340	5,143	10,000 *	10,000 *

NOTES:

ug/kg Micrograms per kilogram

mg/kg Milligrams per kilogram

blank or < Not detected above limits of methodology

NRDC NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)

IGWSCC NJDEP Impact to Ground Water Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)

10,200 Concentration exceeds Non-RDC Soil Cleanup Criteria

* Health Based criterion for total organic contaminants of 10,000 mg/kg

NA Not analyzed

TABLE 5

Detectable VOCs, SVOCs, Petroleum Hydrocarbons and RCRA Metals Concentrations
Geoprobe TM Soil Boring Soil Samples
AOC-Y4-RRE

Sample ID	GP-1A	GP-1B	GP-2A	GP-2B	GP-3A	GP-3B	GP-4A	GP-4B	NJDEP	NJDEP
Sampling Date	04/14/03	04/14/03	04/14/03	04/14/03	04/14/03	04/14/03	04/14/03	04/14/03	NRDCSCC	IGWSCC
Depth Interval (In Feet)	3-3.75	7-7.5	2.5-3.5	7-7.5	3.5-4	7-7.5	3.25-4	5.5-6.5		
Laboratory ID	23040643-001	23040643-002	23040643-003	23040643-004	23040643-005	23040643-006	23040643-007	23040643-008		
Volatile Organic Compounds (In ug/kg)										
Benzene	918			716		6,370		2,200	13,000	1,000
Ethylbenzene	404			2,170		8,250		983	1,000,000	100,000
Toluene	765			390		6,020		439	1,000,000	500,000
Xylene (total)	1,859			3,910		13,920		1,455	1,000,000	67,000
Total VOCs TICs	141,410			298,000		264,900		503,600		
Total VOCs	145,354	NR	NR	305,186	NR	299,460	NR	508,657	1,000,000	1,000,000
Semi-Volatile Organic Compounds (In ug/kg)										
Acenaphthene								19,300 D	10,000,000	100,000
Anthracene				5,130 D		7,110 D			10,000,000	100,000
Benzo[a]anthracene								3,210 D	4,000	500,000
Benzo[a]pyrene						1,040 JD		1,770 D	660	100,000
Benzo[b]fluoranthene									4,000	50,000
Benzo[g,h,i]perylene										
Benzo[k]fluoranthene									4,000	50,000
bis(2-Ethylhexyl)phthalate									210,000	100,000
Chrysene				2,560 D		2,380 D		6,370 D	40,000	500,000
Flouranthene				3,890 D		6,220 D		18,500 D	10,000,000	100,000
Fluorene	21,900 D			8,360 D		12,500 D		28,400 D	10,000,000	100,000
Indeno(1,2,3-cd)pyrene									4,000	50,000
2-Methylnaphthalene	8,500 D			19,300 D		32,600 D				
Naphthalene									4,200,000	100,000
Phenanthrene	16,000 D			16,200 D		24,300 D		54,100 D		
Pyrene				1,540 JD		1,540 JD		5,940 D	10,000,000	100,000
Total SVOCs TICs	1,538,800			720,200		986,600		2,867,000		
Total SVOCs	1,585,200	NR	NR	779,200	NR	1,074,490	NR	3,004,590		
Petroleum Hydrocarbons (In mg/kg)	15,900	9,990	3,310	7,850	6,450	9,200	3,310	17,200		
Total Organic Contaminants (In mg/kg)	17,500.65	9,990	3,310	8,934.39	6,450	10,574.95	3,310	20,712.25	10,000 *	10,000 *
RCRA Metals (In mg/kg)										
Arsenic	47.5	NR	6.56	NR	12.8	NR	10.6	NR	20	
Barium	33.6	NR	20.7	NR	196	NR	96.8	NR	47,000	
Cadmium	0.36	NR	1.49	NR	0.45	NR		NR		
Chromium	6.78	NR	12.8	NR	7.84	NR	13.7	NR	6,100 **	
Lead	296	NR	31.1	NR	261	NR	131	NR	800	
Mercury	0.67	NR	0.067	NR	0.214	NR	0.16	NR	270	
Selenium	3.62	NR	1.26	NR	5.45	NR	1.63	NR	3,100	
Silver		NR		NR		NR		NR	4,100	

NOTES:

ug/kg	Micrograms per kilogram
mg/kg	Milligrams per kilogram
blank or <	Not detected above limits of methodology
TICs	Tentatively Identified Compounds
NR	Analysis not run for sample
J	Concentrations is estimated below the limits of the methodology
D	Diluted sample
B	Compound also detected in blank

NRDC	NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)
IGWSCC	NJDEP Impact to Ground Water Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)
47.5	Concentration exceeds Non-RDC Soil Cleanup Criteria
*	Health Based criterion for total organic contaminants of 10,000 mg/kg
**	Criteria for hexavalent Chromium - criterion based on inhalation exposure pathway

TABLE 5

Detectable VOCs, SVOCs, Petroleum Hydrocarbons and RCRA Metals Concentrations
Geoprobe TM Soil Boring Soil Samples
AOC-Y4-RRE

Sample ID	GP-5A	GP-5B	GP-6A	GP-6B	GP-7A	GP-7B	GP-8A	GP-8B	NJDEP	NJDEP	NJDEP
Sampling Date	04/14/03	04/14/03	04/14/03	04/14/03	04/14/03	04/14/03	04/14/03	04/14/03	NRDCSCC	RDCSCC	IGWSCC
Depth Interval (In Feet)	1.75-2.25	6-7.0	2.5-3.25	7.5-8	3-4.0	5-6.0	3-4.0	6.5-7			
Laboratory ID	23040643-009	23040643-010	23040643-011	23040643-012	23040643-013	23040643-014	23040643-007	23040643-008			
Volatile Organic Compounds											
(In ug/kg)											
Benzene		238 J		1,180	282 J			250 J	13,000	3,000	1,000
4-Chlorotoluene		80 J									
1,2-Dichlorobenzene				2,880					10,000,000	5,100,000	50,000
1,3-Dichlorobenzene				619					10,000,000	5,100,000	100,000
1,4-Dichlorobenzene				1,680					10,000,000	570,000	100,000
Ethylbenzene		858		7,310	421			208	1,000,000	1,000,000	100,000
Toluene		191 J		1,080	442			108 J	1,000,000	1,000,000	500,000
Xylene (total)		1,037		2,300	2,950			1,122	1,000,000	410,000	67,000
Total VOCs TICs		239,800		392,400	126,200			98,170			
Total VOCs	NR	242,204	NR	409,429	130,305	NR	NR	99,858	1,000,000	1,000,000	1,000,000
Semi-Volatile Organic Compounds											
(In ug/kg)											
Acenaphthene		2,810 D		14,700 D	5,380 D			10,400 D	10,000,000	3,400,000	100,000
Anthracene				4,680 D					10,000,000	10,000,000	100,000
Benzo[a]anthracene				9,930 D					4,000	900	500,000
Benzo[a]pyrene		432 JD		7,760 D	4,930 JD			1,600 D	660	660	100,000
Benzo[b]fluoranthene				1,620 D					4,000	900	50,000
Benzo[g,h,i]perylene											
Benzo[k]fluoranthene				1,710 D					4,000	900	50,000
bis(2-Ethylhexyl)phthalate		739 JBD		12,600 JBD					210,000	49,000	100,000
Chrysene		1,550 D		11,400 JD	3,450 D			4,770 D	40,000	9,000	500,000
Flouranthene		3,280 D		18,600 D	7,090 D			5,950 D	10,000,000	2,300,000	100,000
Fluorene		4,470 D		23,100 D	6,410 D			8,270 D	10,000,000	2,300,000	100,000
Indeno(1,2,3-cd)pyrene									4,000	900	50,000
2-Methylnaphthalene				799,000 D	31,600 D			18,000 D			
Naphthalene									4,200,000	230,000	100,000
Phenanthrene		9,410 D		41,900 D	12,500 D			15,800 D			
Pyrene		810 JD		8,540 JD	1,340 JD			1,320 D	10,000,000	1,700,000	100,000
Total SVOCs TICs		462,000		1,438,300	694,500			1,430,300			
Total SVOCs	NR	495,511	NR	2,385,840	763,280	NR	NR	1,496,410			
Petroleum Hydrocarbons											
(In mg/kg)	211	1,830	4,540	17,100	9,790	6,180	1,830	2,490			
Total Organic Contaminants											
(In mg/kg)	211	2,557.72	4,540	14,895.27	10,973.59	6,180	1,830	4,088.27	10,000 *	10,000 *	10,000 *
RCRA Metals											
(In mg/kg)											
Arsenic	11.9	NR	11.1	NR	3.2	NR	1.24	NR	20	20	
Barium	48.5	NR	48.2	NR	35.5	NR	11.1	NR	47,000	700	
Cadmium	0.48	NR	0.33	NR	0.26	NR	0.14	NR			
Chromium	65	NR	28	NR	8.35	NR	2.23	NR	6,100 **	240 **	
Lead	57.3	NR	197	NR	92.4	NR	16.1	NR	600	400	
Mercury	0.366	NR	0.128	NR	0.072	NR	0.127	NR	270	14	
Selenium		NR		NR		NR		NR	3,100	63	
Silver		NR		NR		NR		NR	4,100	110	

NOTES:

ug/kg	Micrograms per kilogram	D	Diluted sample
mg/kg	Milligrams per kilogram	B	Compound also detected in blank
blank or <	Not detected above limits of methodology	NR	Analysis not run for sample
TICs	Tentatively Identified Compounds	J	Concentrations is estimated below the limits of the methodology

NRDC	NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)
IGWSCC	NJDEP Impact to Ground Water Soil Cleanup Criteria (N.J.A.C. 7:26D Last Revised 5/12/99)
17,100	Concentration exceeds Soil Cleanup Criteria
*	Health Based criterion for total organic contaminants of 10,000 mg/kg
**	Criteria for hexavalent Chromium - criterion based on inhalation exposure pathway

SAMPLE 6B - SVOC VALUES ARE THE GREATER CONCENTRATIONS OF THE TWO DILUTED RUNS

APPENDIX A

SITE HISTORY

ENSR 1996

Bayonne Industries, Inc.

Bayonne, New Jersey

Phase I Remedial Investigation Report

Volume 1 of 4

ENSR Consulting and Engineering

November 1996

Document Number 3782-009-392

Certifications

General Objection

Bayonne Industries, Inc., objects to the certification requirement in that the requirement of certification herein is beyond the scope of authority granted to the Department by applicable statues and is in conflict with the pre-existing contractual provisions of the MOA executed between Bayonne Industries and the Department. The certification requirement is, thus, unconstitutional. However, in light of the fact that submissions made to the Department without the certifications are deemed by the Department to be incomplete, Bayonne Industries signs below subject to the proviso that Bayonne Industries and the signatories hereunder reserve all rights to challenge the certification requirement in any civil or criminal enforcement proceeding.

N.J.A.C. 7:26E-1.5(b)

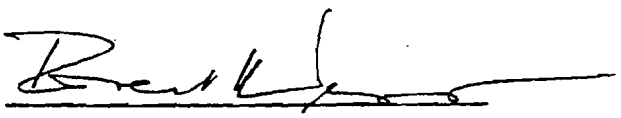
This submission is certified pursuant to N.J.A.C. 7:26E-1.5(b) and the certification is made subject to the statutory provisions of N.J.S.A. 2C:28-3(a). Because of the limitations imposed by the manner in which information is collected and summarized, there is no one person who has direct knowledge of all the information used to prepare the submission and who also has overall responsibility for all of the information contained in the submission; however, based on the above and the General Objection and my review of the information transmitted in this submission:

> "I certify under penalty of law that the information provided in this document is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statue. I am personally liable for the penalties."

N.J.A.C. 7:26E-1(c)(1)

This submission is certified pursuant to N.J.A.C. 7:26E-1(c)(1) and the certification is made subject to the statutory provisions of N.J.S.A. 2C:28-3(a). Based on the above and the General Objection and my review of the information transmitted in this submission:

> "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."



Dr. Robert Weaver, Ph.D.
Vice President, Technical Director

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2.0 SITE BACKGROUND

The Bayonne Industries, Inc. site is located on the east side of Bayonne, in Hudson County, New Jersey, in area often referred to as the Constable Hook. Figure 2-1 presents a site location/1-mile vicinity map of the area, prepared from U.S. Geological Survey 7.5-Minute Quadrangles. This map shows the current site boundaries, local topography, general surface water drainage, and general land use patterns. A detailed site plan is included in Appendix A. Since 1956, the site has been used by Bayonne Industries and its lessees as a bulk liquid terminal providing storage and trans-shipment services for fuel products, fuel-related products, plasticizers, paraffins, and other chemicals. Liquid materials are received and shipped by marine vessels, tank trucks, railcars and pipeline. The products are stored in large aboveground tanks surrounded by dikes providing spill containment. Bayonne Industries does not own the product stored, but simply provides warehousing and transfer services. Accordingly, inventory is strictly monitored. Prior to 1956, the site was part of a larger configuration used by a former Tidewater Oil Company refinery operation which began in the 1870s.

This section provides a summary of the site background and history. Information previously provided in the RIWP is included in this section as well as supplemental information gathered during the historical records search and aerial photograph interpretation. Section 2.0 includes two Subsections, 2.1 Physical Setting and 2.2 Site History.

2.1 Physical Setting

This section provides a general description of the site, its location, neighboring properties, area land use, surface water and drainage, and regional and site specific geology/hydrogeology.

2.1.1 Site Description

As illustrated on the site plan in Appendix A, the site is bounded by the Kill van Kull to the south, 22nd Street generally to the north, an Exxon site to the east (part of which was purchased by IMTT - BX in 1993), and the eastern end of Oak Street to the west. The site is bisected by a Conrail right-of-way, with approximately one-third of the site lying north of the right-of-way. The property consists of approximately 200+ acres, much of which is reclaimed land, with a mixed fill composed of layers of construction debris, cinders, clay, etc., overlying the original marine tidal marsh deposits found below the majority of the site. The main waterfront of the facility is located along the Kill van Kull, providing shipping access to Newark Bay, approximately 1.1 miles west of the property, and upper New York Bay, approximately 1 mile east of the property.

There are some 250+ aboveground bulk storage tanks at the site with capacities ranging from 10,000 gallons to 10.4 million gallons, configured into "yards" based on tank number series and generally by the products stored in the respective tank series. All bulk storage tanks are within containment dikes. A marine vessel transfer area featuring five active piers arrayed along the Kill van Kull waterfront, and numerous buildings housing offices, utilities, and maintenance and general operations field stations, as well as in-plant warehousing are located at the site. Most of the facility has been extensively refurbished since the 1983 acquisition by the present ownership.

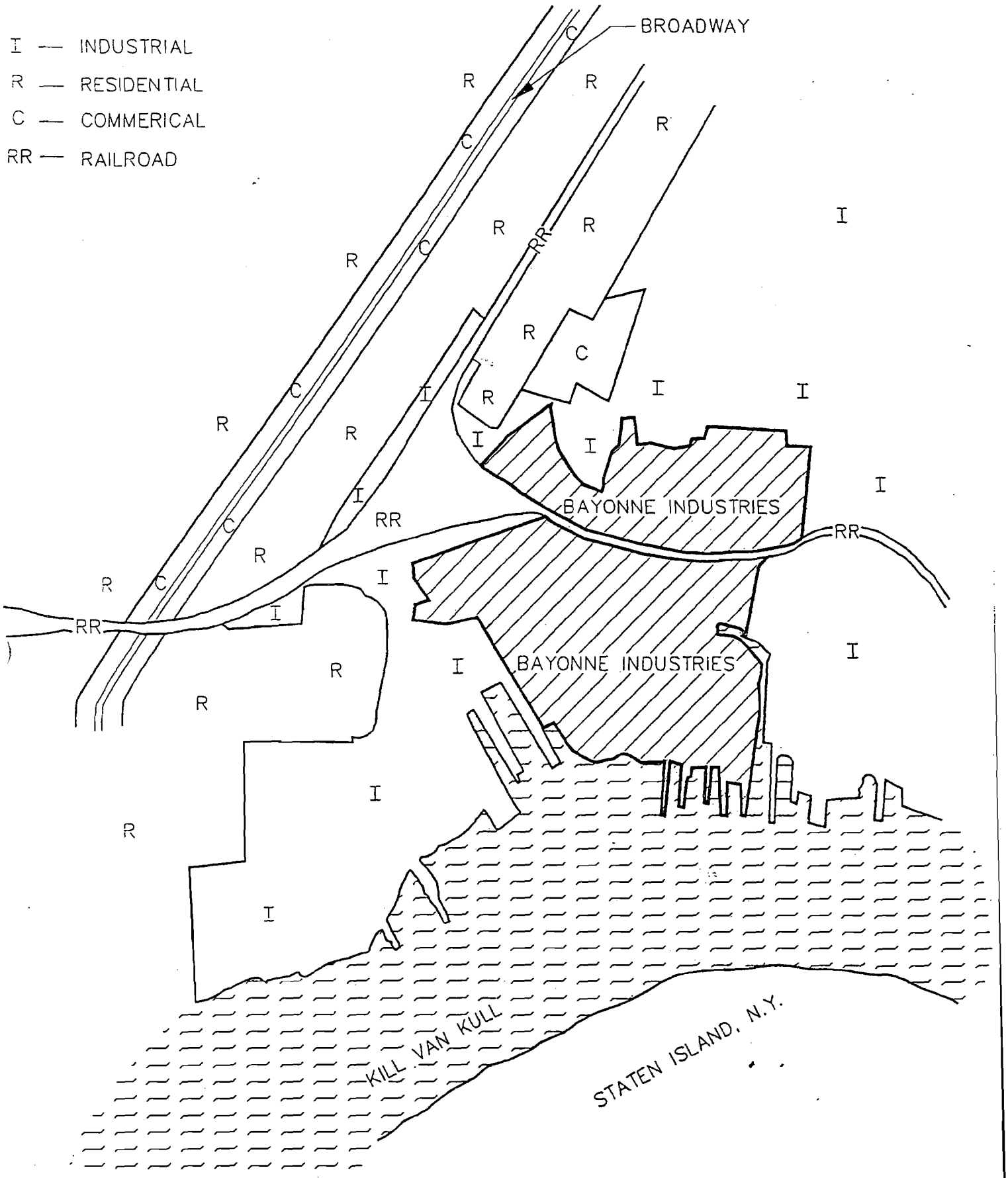
Geographically, the site is generally flat with the one topographic feature, the elevated outcropping that substantially forms the base of Yard 5. All stormwater on the site is collected by drainage through sewers to the site's water treatment facility, from which a single NJPDES permitted and monitored outfall is discharged into the Kill van Kull.

2.1.2 Area Land Use

Figure 2-2 depicts land use/zoning patterns surrounding the Bayonne Industries site. Approximately 25 percent of the land is zoned for residential development, while 70 percent is zoned commercial and industrial. The Kill van Kull encompasses the southern half of the west border of the site. Highway and major transportation systems, including the recently constructed Route 169, Conrail, and the New Jersey Transit Railway, are easily accessible to the site.

The 200-acre Bayonne Industries site is part of an extensive industrial development bordering the Conrail/New Jersey Transit corridor. The topography of the surrounding heavily developed industrial area is generally flat. Industries to the east of the site include Exxon, Powell Doffryn, Gel Spice, City of Bayonne, and the Hess Oil Company Tank Terminal. Industries to the north include Public Service Electric and Gas (PSE&G), Anflyte Electronics, Farina Patio, McGovern Trucking, I.C.I. America, Bayonne Durable, and Kenrich Petrochemical. To the west lies the Bayonne Sewerage Treatment Plant.

Residential areas of the City of Bayonne lies generally upland of the site to the north and west. Residential areas are located within 0.5 mile of the Bayonne Industries boundaries, west and north of the site. No public schools or municipal parks are located directly adjacent to the site boundaries.



ENSR

ENSR CONSULTING & ENGINEERING

DATE: MAY 1993	SCALE: NOT TO SCALE	FIGURE: 3-2

LAND USE/ZONING MAP
BAYONNE INDUSTRIES INC., BAYONNE, N.J.

APPROVED BY: DG	PROJECT NUMBER	3782-006-07D-15A

2.1.3 Surface Water

The Bayonne Industries site is bounded on its south by the Kill van Kull waterway, separating the Constable Hook area from Staten Island, New York. Adjoining the property to the west is an inlet serving the Bayonne Yacht Club, at the mouth of which are some sunken schooners. To the east is a rectangular cut in the filled waterfront formerly used as a barge slip and now known as the Platty Kill Canal. Neither inlet is a natural outlet for stormwater from an upland watershed. The Kill van Kull and Platty Kill Canal are both tidally influenced.

Bayonne Industries has instituted several control measures over the years to minimize seepage of oil into the waterways. Presently, Bayonne Industries maintains a continuous floating oil boom on the Kill van Kull along the waterfront from Pier 4 to Pier 1. Any oil or debris that is collected is removed periodically, and plant personnel conduct a daily inspection of the waterfront to monitor the performance of the booms and to identify and mitigate any unexpected problems. The Platty Kill Canal is separated from the Kill van Kull by a sheetpile dam that was constructed at the mouth of the canal in 1990 to prevent oil and other floating debris in the canal from entering the Kill van Kull waterway.

To further isolate the waterfront from excessive precipitation-derived runoff, which is possibly contaminated, numerous control measures have been installed. These include:

- A wooden bulkhead constructed on pilings at the waterfront between Piers 1 and 4. It extends for a distance of approximately 750 feet, and is approximately 25 feet wide and 11 feet deep to the pilings, which are set into the underlying clay. Outboard of this wooden bulkhead is a concrete bulkhead.

- A bulkhead approximately 20 feet wide and 25 feet deep, reportedly installed to hardpan, extends west from Pier 1 for approximately 275 feet along the waterfront.

- A clay wall, installed specifically as a pollution barrier, reportedly runs along the southwestern site boundary, extending from Pier A to the diked areas of Tanks 6203 and 6204. The construction specifics on this clay wall and its effectiveness are unknown at this time. An investigation of the slurry wall location and construction will be included as part of the Westside Waterfront IRA.

- The old separator pond (Platty Kill Pond) is effectively segregated from the Platty Kill Canal by a synthetic barrier built into the existing dike. The best available details (construction, and materials) associated with this barrier are provided in the November

1979 Weston report entitled "Evaluation of Control Alternatives for the Separator Pond." This report was included as Appendix M in the Phase 1 RIWP.

- To control the seepage of oil from the shore to the Kill van Kull in the vicinity of the mouth of the Platty Kill Canal, the existing wooden bulkhead south of the sheetpile dam was reconstructed. The new bulkhead consisted of a series of 35-foot long interlocking steel sheetpiles that began at the sheetpile dam and extended approximately 237 feet southward along the canal bank. A subsurface retainage wall (product curtain) was also installed perpendicular to and connecting with the south end of the new bulkhead, to facilitate free-phase product recovery. To further reduce the potential for potential seepage from the shore to the waterway, the void space between the old wooden bulkhead and newly constructed sheetpile bulkhead was filled with a certified clean, clay based fill. This work was conducted as part of the Platty Kill Canal IRA.

2.1.3.1 Surface Drainage

Stormwater runoff from all potential areas of concern on the site is directed to a stormwater drain system. This drain system directs the stormwater to an on-site water treatment plant in Yard 3, where it ultimately passes through an oil/water separator, a induced air flotation unit, and carbon adsorption as treatment before being discharged to the Platty Kill Canal, as per Bayonne Industries' NJPDES Surface Water Discharge permit. Operation of the on-site wastewater treatment plant started in May 1978. Prior to this time, all collected wastewater and stormwater from the site was discharged to the old separator pond (Platty Kill Pond) located at the head of the Platty Kill Canal.

2.1.3.2 Wetlands

A national wetlands inventory map for the site and surrounding area was included as Appendix E in the RIWP. This map indicates the presence of one wetland area located on the site, curiously identified as Palustrine Open Water (POW). This identified wetland area is actually the stormwater drainage basin located in Yard 5. The map also indicates a wetland area classified as estaurine intertidal flat (E2FL), adjacent to the southwest site boundary. There are no other identified wetland areas on or adjacent to the site indicated on the wetland map. Also included in Appendix E of the RIWP was a State of New Jersey Freshwater Wetlands Map. This map does not delineate any identified wetland areas on or adjacent to the Bayonne Industries site.

2.1.4 Regional Geology and Hydrogeology

The Bayonne Industries site is located near the boundary between the Triassic Lowland and

Manhattan Prong structural regions of the Piedmont Physiographic Province of New Jersey. The site is underlain by a stratigraphic sequence including unconsolidated sands, silts, and clays of Recent and Pleistocene age, and consolidated and weathered bedrock of Triassic and Precambrian age (Eckenfelder, Inc., 1992).

Within the general vicinity of the site, two distinct bedrock groups have been recognized: the Newark Supergroup of Triassic/Jurassic age, and the Manhattan Schist of Precambrian to Cambrian age (Lyttle and Epstein, 1987). The Manhattan Schist is a dark gray, micaceous schist or layered gneiss with subordinate metaquartzite, metagraywacke, and amphibolite (Lyttle and Epstein, 1987; Soren, 1988).

The contact between the Stockton and Lockatong Formations of the Newark Supergroup (Lyttle and Epstein, 1987) within the Newark Basin exists in the area of the Bayonne Industries site. The Stockton Formation generally consists of sandstone, mudstone, and siltstone. Overlying the Stockton Formation is the Lockatong Formation, which consists of finer-grained, more argillaceous mudstone and siltstone. Groundwater measurement within the bedrock likely occurs along faults, fractures, and bedding planes.

Overlying the bedrock in this area are unconsolidated glacial and post-glacial sediments. Glacial sediments likely consist of glacial till, glaciolacustrine clay, and glacial sands. Post-glacial sediments include Recent sand, silt, and clay; some of this clay is commonly termed "meadow mat." The Recent silt and clay are reportedly of marine origin deposited during the recessional period of the Wisconsin glaciation (Lueder, Obear, Holman, Rogers, 1952). The depositional environment of these units is well defined by Carswell (1976) for the Hackensack River Basin; however, based on the position of the terminal moraine, the depositional description applies to the Bayonne Industries site area as well. Carswell describes the depositional environment as follows:

> "During Pleistocene time glaciers which advanced across the basin probably removed an unknown thickness of weathered or easily eroded rock and soil . . . A few miles south of the Hackensack River basin, frontal deposits from the melting ice sheet accumulated as a terminal moraine.
>
> Streams of melt water issuing from the stagnating and retreating glacier formed stratified deposits of gravel, sand, silt, and clay. As the glacier retreated, crustal downwarping beneath the glacier, as a result of its weight, combined with blockage of drainage by the terminal moraine to the south ponded the melt water forming a lake known as Lake Hackensack in the area of the present Newark Bay and Hackensack Meadows and extending northward into Rockland County, New York. Subsequently, this lake was

partly filled with deposits of varied silts, and clay prior to the establishment of outlets which drained the lake. The lake beds were eventually veneered with alluvium and a mat (meadow mat) of decayed plant material."

The meadow mat is now overlain by fill materials used to reclaim the area for industrial use. An upper water bearing zone exists within the fill materials now underlain by the meadow mat.

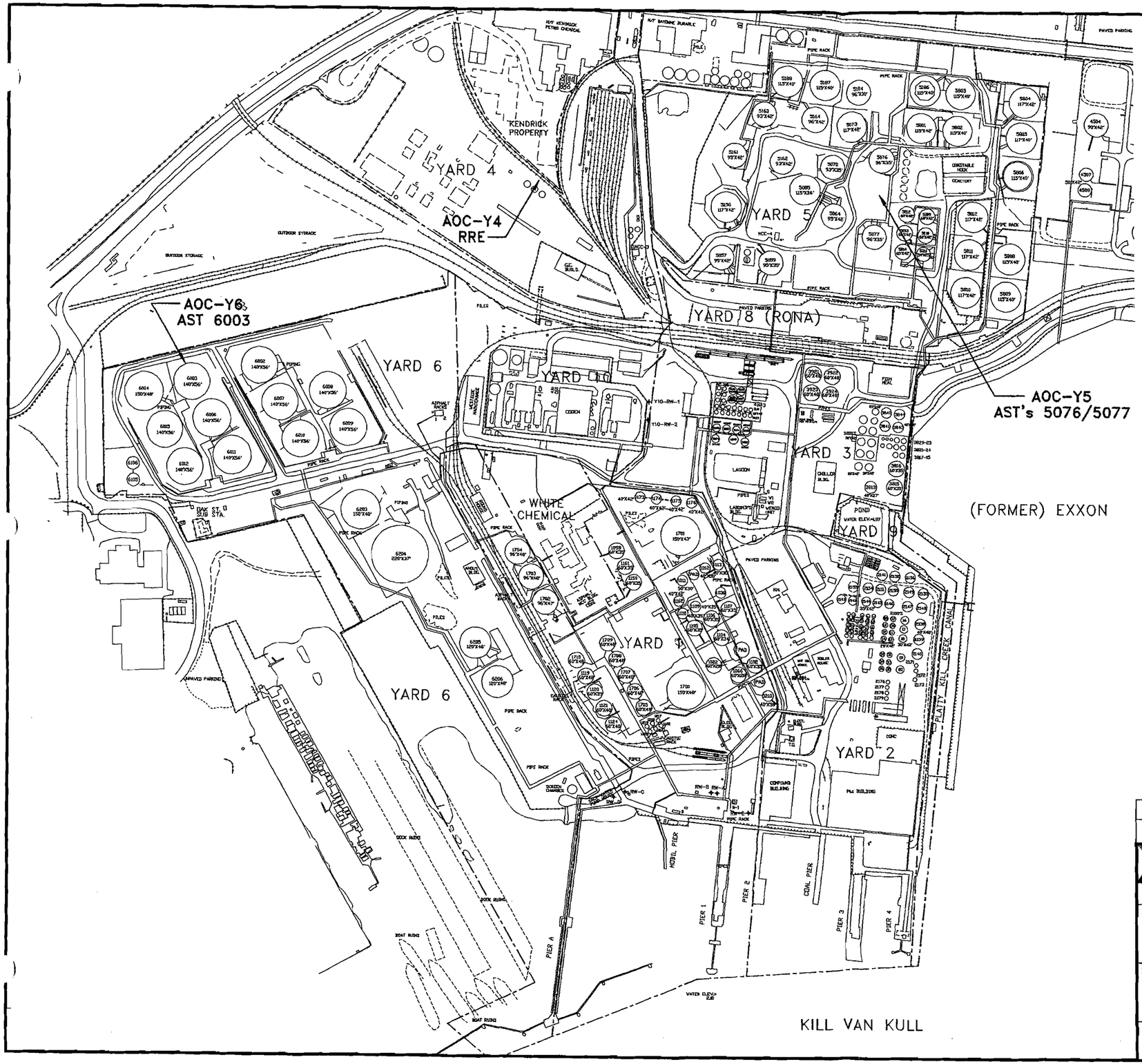
There is clearly a close connection between the environment of deposition of natural sediments underlying the site and the hydrogeologic characteristics of the sediments. Based on the environment of depositions identified by Carswell and others for the area, and the anticipated flow regime, the meadow mat and underlying lacustrine clays should provide some level of physical confinement to the groundwater below.

2.1.5 Site Geology and Hydrogeology

A model of the site stratigraphy was previously developed and included in the RIWP. This model was based on a review of available soil boring and monitoring well construction logs. This section has been updated based on the results of the preliminary soil investigation, groundwater monitoring well installations and deep exploratory borings installed as part of the Phase I RI activities. As reported in the RIWP, 23 of the 28 existing monitoring wells installed during previous geologic and hydrogeologic investigations as well as geotechnical borings related to construction of the on-site cogeneration facility identified an organic silty clay overlain by fill material. The most recent subsurface investigations confirmed the existence of these features throughout the site. The fill material is composed of cinders, slag, wood, concrete, etc., and ranges in thickness from 6 to 18 feet. The organic silty clay ranges in thickness from 4 to 15 feet, and is underlain by glaciofluvial sands and gravels which overlie bedrock. There are three major bedrock types underlying the site. These include the Palisades Diabase, the Lockatong Formation (shale/acgillite) and the Stockton Formation (siltstone/shale). Depending on the location within the site, bedrock occurs between 36 and 100 feet below grade.

All existing monitoring wells at the site are screened above the organic silty clay. Based on geotechnical tests performed during the RI, the hydraulic conductivity of the organic silty clay ranges from 5.2×10^{-10} cm/sec to 1.8×10^{-7} cm/sec. The depth to groundwater at the site ranges from approximately 1 to 18 feet below ground surface. The general groundwater flow direction across the site is towards the Kill van Kull (south-southwest).

A more detailed description of the site geology is provided in Section 6.0.



NORTH

LEGEND

- YARD BOUNDARIES
- PIPELINES
- 1701 150'X43' — TANK LOCATION WITH DIMENSIONS
- RAILROAD TRACKS
- FENCE

0 200 400 800

SCALE: 1"=400'

SITE_LAYOUT.DWG						
CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY

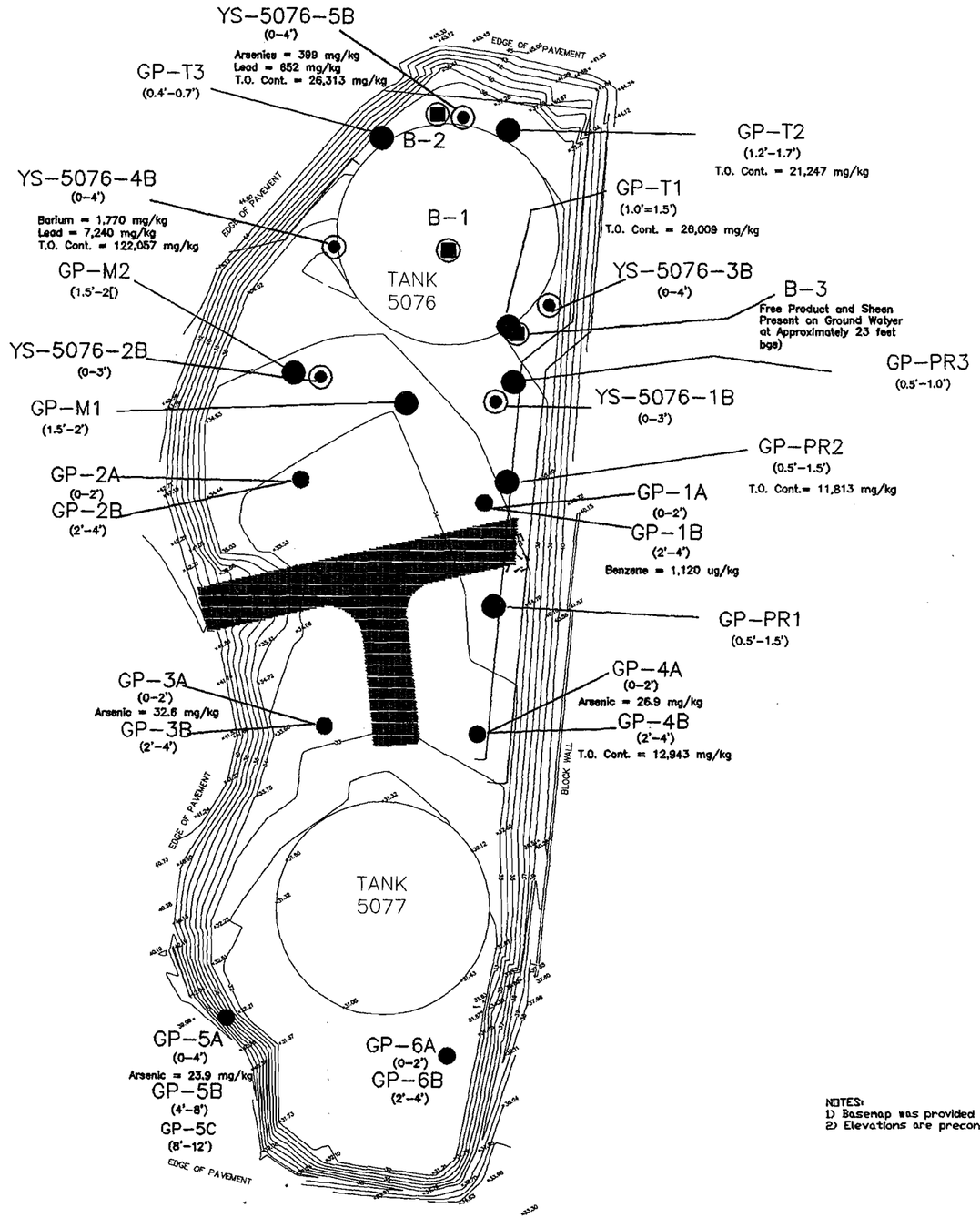
BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.
489 UNION AVENUE, SUITE C
BRIDGEWATER, NEW JERSEY 08807

PREPARED FOR:
BAYONNE INDUSTRIES, INC.
BAYONNE
NEW JERSEY

FIGURE 2

SITE/DESCRIPTION:
SITE LAYOUT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
AMC	DAR	GB	RCW	03/09/04	–	0



NOTES:
1) Basemap was provided by Prism, Environmental, Inc.
2) Elevations are preconstruction elecvations.

NEW JERSEY STATE PLANE COORDINATE SYSTEM NAD 83

LEGEND

GP-4A ●	Geoprobe Soil Sample for Tank 5077 Activities (Collected 8/06/02)
YS-5076-1B ◉	Geoprobe Soil Sample Location for Tank 5076 (Collected 1/08/03)
GP-PR-1 ●	Geoprobe Soil Sample for Tank 5076 Activities (Collected 1/17/03)
(0-4')	Sample Depth Below Ground Surface
Arsenic = 23.9 mg/kg	Compound and Concentration in Exceedance of NJDEP Soil Cleanup Criteria (T.O. Cont. = Total Organic Contaminants)
B-1 ◉	Geotechnical Soil Boring (Installed 1/02/03 to 1/06/03)

0 30 60 120

SCALE: 1"= 60'

AOC1YARD5						
CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY

BLUESTONE ENVIRONMENTAL

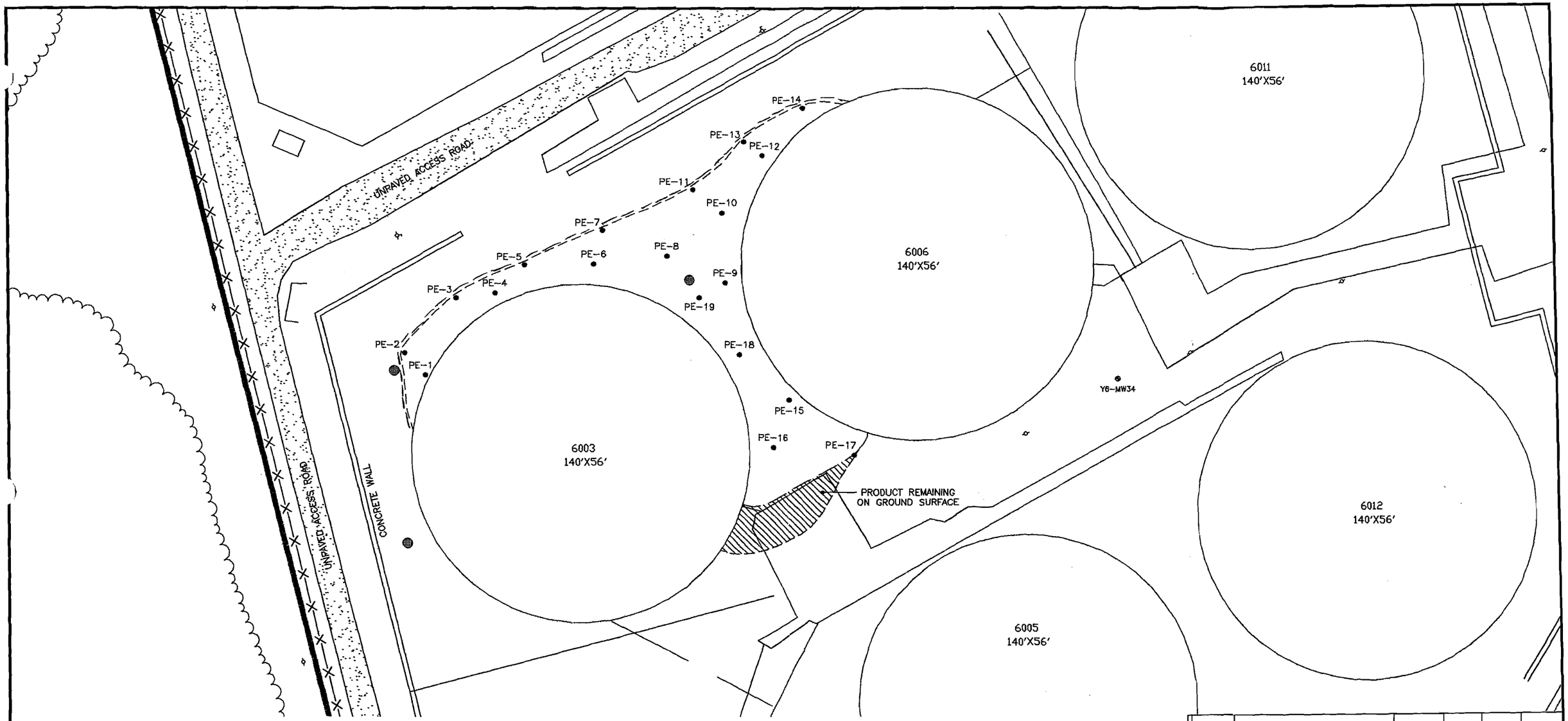
BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.
489 UNION AVENUE, SUITE C
BRIDGEWATER, NEW JERSEY 08807

PREPARED FOR: BAYONNE INDUSTRIES, INC.
BAYONNE
NEW JERSEY

FIGURE 3

SITE/DESCRIPTION: AOC-Y5-ASTS
5076/5077

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
	DJP	AC	DS	21JUL03	–	0



NORTH

0 20 40 80

SCALE: 1"=40'

LEGEND

- STORM SEWER INLET GRATE
- 6003 140'X56' — TANK LOCATION WITH DIMENSIONS
- FENCE
- PE-1 — POST-EXCAVATION SAMPLE LOCATION AND DESIGNATION
- LIMIT OF EXCAVATION/ GRADING
- LIMIT OF SURFACE SPILL

TANK-6003

CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY

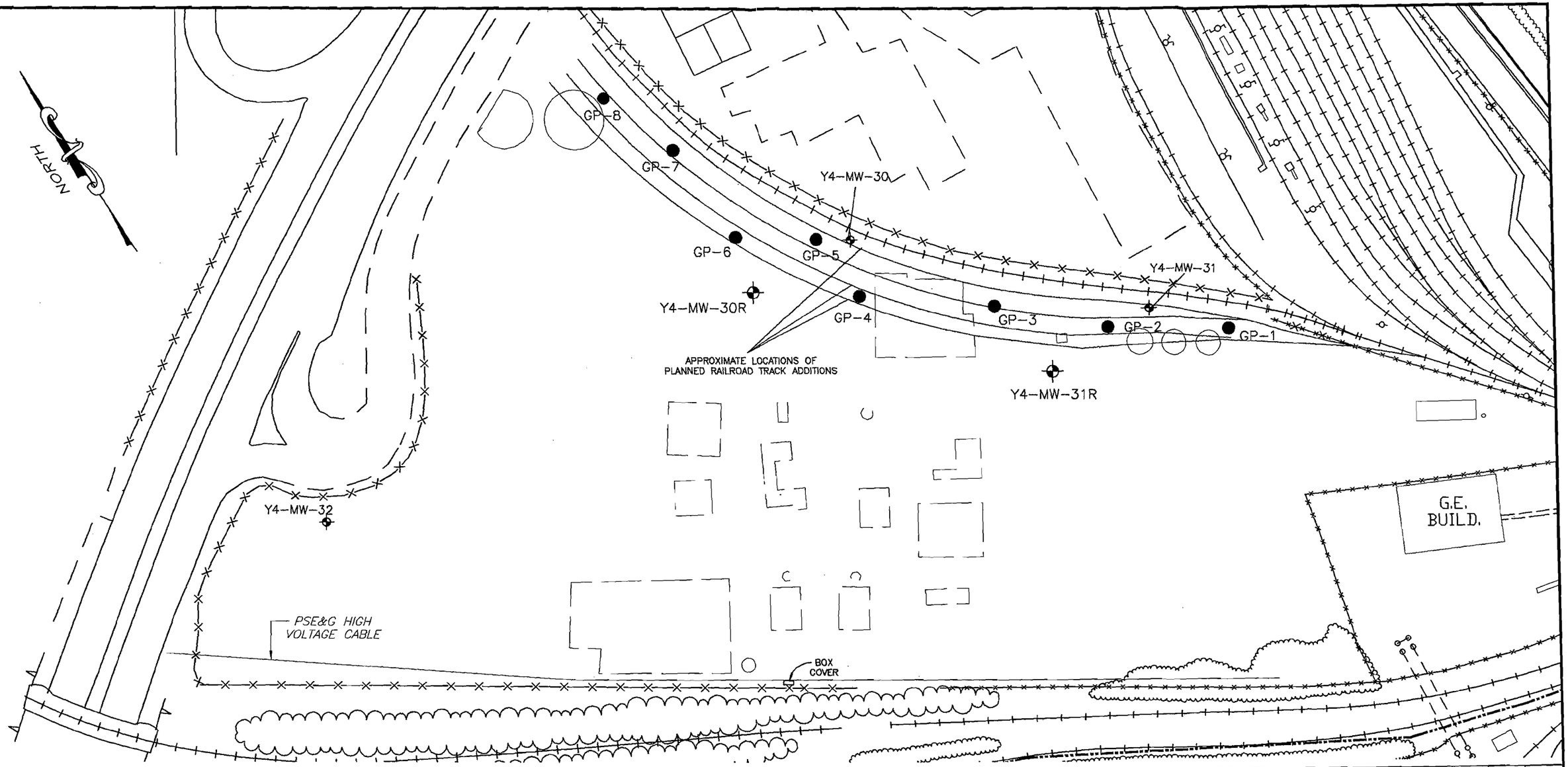
BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.
489 UNION AVENUE, SUITE C
BRIDGEWATER, NEW JERSEY 08807

PREPARED FOR: BAYONNE INDUSTRIES, INC.
BAYONNE
NEW JERSEY

FIGURE 4

SITE/DESCRIPTION: AOC-Y6-AST 6003

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
–	DAR	JW	AMC	03/26/03	–	0



LEGEND

Y4-MW-32 — EXISTING MONITORING WELL LOCATION

● — GEOPROBE SOIL BORING LOCATION

0 50 100 200

SCALE: 1"=100'

YARD41117						
CADD DWG. FILE	REV. NO.	REV. DESCRIPTION	DATE	DSN BY	CH'D BY	APP'D BY

BLUESTONE ENVIRONMENTAL

BLUESTONE ENVIRONMENTAL SERVICES, L.L.C.
489 UNION AVENUE, SUITE C
BRIDGEWATER, NEW JERSEY 08807

PREPARED FOR: BAYONNE INDUSTRIES, INC.
BAYONNE
NEW JERSEY

FIGURE 5

SITE/DESCRIPTION: AOC-Y4-RRE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	DRAWING NO.:	REVISION NO.:
	DJP	AC		03/09/04	-	0

2.1.6 Well Search

ENSR conducted a well search by obtaining copies of well records from NJDEP for wells within a 1-mile radius of the Bayonne Industries Site. A total of 159 wells were identified. No potable supply wells in the area were identified in the search. Uses of the wells identified within one mile of the site included monitoring, piezometers, borings, test borings, and gas vents. A summary table of the wells identified and their use is presented in Table 2-1. Based on the well search conducted, groundwater is not used as a potable source within a 1-mile radius of the site.

2.2 Site History

This section provides a summary of the site history including past and present site owners and operators, past and present tenants, previoud investigations, and interpretation of aerial photographs.

2.2.1 Site Owners and Operators

The main portion of the Bayonne Industries site has had two owners since the 1870s, and a number of tenants have occupied various identifiable areas on the location. At this time Bayonne Industries conducts no operations of its own and is solely the lessor of the property. The following is a chronology of ownership and operations from 1870 to present.

- 1870 - February 15, 1956: This was the period when the site was owned and operated by Tidewater Oil Company. Tidewater operated the site variously as a coal terminal, oil refinery and liquid petroleum terminal.

- 1956 - 1983: The facility was sold in 1956 to Bayonne Industries, Inc., whose majority shareholders were Certified Terminals, Inc. and the Pittston Company. Bayonne Industries' wholly owned subsidiary Bayonne Terminal Warehouse Corp. operated the larger part of the facility as a non-manufacturing liquid petroleum terminal. Bayonne Industries also leased out portions of the property for third-party warehousing and minor manufacturing operations. Several affiliated firms' names appear in the record as well, including in particular Metropolitan Petroleum Company (linked to Pittston), Paragon Oil Company (linked to Texaco), and Petroleum Separating Company (customer owner of tanks 5810 - 5812).

- 1983 - Present: Certified Terminals and Pittston sold their stock in Bayonne Industries to the present owners in the fall of 1993. Bayonne Industries then leased the larger portion of the site to IMTT - Bayonne who continue operations as a bulk liquid terminal.

TABLE 2-1 Well Search, Bayonne Industries Bayonne, New Jersey

NO.	L OWNER	ADDRESS	TOTAL D.	LENGTH OF CASING	STATIC WATER ELEV.	USE	SOURCE OF MATION
1	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	33'	3'	NR	6	J.E. Fritts & Associates, Inc.
2	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	30'	5'	NR	6	J.E. Fritts & Associates, Inc.
3	Amoco Oil Company	150 S. Warner Road, King of Prussia, PA	16'	1'	10'	6	Handex Corp.
4	Amoco Oil Company	150 S. Warner Road, King of Prussia, PA	16'	1'	12'	6	Handex Corp.
5	Amoco Oil Company	150 S. Warner Road, King of Prussia, PA	16'	1'	9'	6	Handex Corp.
6	United Roofing & Sheetmet	211 West 5th Street, Bayonne, NJ	20'	4'6"	5'	6	Advanced Environmental Boring
7	United Roofing & Sheetmet	211 West 5th Street, Bayonne, NJ	20'	4'6"	5'	6	Advanced Environmental Boring
8	Exxon Chemical	P.O. Box 636, Linden, NJ 07036	17'	2'	6'	6	Summit Well Drilling
9	Exxon Chemical	P.O. Box 636, Linden, NJ 07036	17'	2'	6'	6	Summit Well Drilling
10	430 Hook Road Corp.	33 Hook Road, Bayonne, NJ 07002	13'	3'	None	6	Warren George Inc.
11	430 Hook Road Corp.	33 Hook Road, Bayonne, NJ 07002	15'	4'	5.5'	6	Warren George Inc.
12	430 Hook Road Corp.	33 Hook Road, Bayonne, NJ 07002	14'	3'5"	5'2"	6	Warren George Inc.
13	430 Hook Road Corp.	33 Hook Road, Bayonne, NJ 07002	16'	4'5"	5'	6	Warren George Inc.
14	430 Hook Road Corp.	33 Hook Road, Bayonne, NJ 07002	15'	5'	5'	6	Warren George Inc.
15	430 Hook Road Corp.	33 Hook Road, Bayonne, NJ 07002	14.5'	4'5"	5'	6	Warren George Inc.
16	Tucker, A.G.	2 Commerce Street, Bayonne, NJ 07002	18'	3'	5'	6	Jersey Boring
17	Tucker, A.G.	2 Commerce Street, Bayonne, NJ 07002	18'	2'	5'	6	Jersey Boring
18	Tucker, A.G.	2 Commerce Street, Bayonne, NJ 07002	18'	2'	5'	6	Jersey Boring
19	Tucker, A.G.	2 Commerce Street, Bayonne, NJ 07002	10'	2'	3'	6	Jersey Boring
20	Tucker, A.G.	2 Commerce Street, Bayonne, NJ 07002	9'	2'	3'	6	Jersey Boring
21	Tucker, A.G.	2 Commerce Street, Bayonne, NJ 07002	5'	2'	3'	6	Jersey Boring
22	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	31'3"	NR	NR	B	J.E. Fritts & Associates, Inc.
23	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	32'	NR	NR	B	J.E. Fritts & Associates, Inc.
24	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	32'	NR	NR	B	J.E. Fritts & Associates, Inc.
25	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
26	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
27	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
28	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
29	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
30	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
31	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
32	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
33	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
34	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
35	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
36	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
37	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
38	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
39	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
40	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
41	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
42	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
43	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
44	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
45	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
46	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
47	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
48	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	10'	2'	NR	0	J.E. Fritts & Associates, Inc.
49	Hess Corporation	1 Hess Plaza, Woodbridge, NJ 07095	31'	NR	None	B	Warren George Inc.
50	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	33'	3'	NR	6	J.E. Fritts & Associates, Inc.
51	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	30'	5'	NR	6	J.E. Fritts & Associates, Inc.
52	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	30'	5'	NR	6	J.E. Fritts & Associates, Inc.
53	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	30'	5'	NR	6	J.E. Fritts & Associates, Inc.
54	City of Bayonne	630 Avenue C, Bayonne, NJ 07002	29'	4'	NR	6	J.E. Fritts & Associates, Inc.
55	Amoco Oil	Carteret, NJ	17'	3'	NR	6	Handex Corp.
56	Amoco Oil	Carteret, NJ	19'	3'	NR	6	Handex Corp.

TABLE 2-1 Well Search, Bayon[illegible] Industries Bayonne, New Jersey

NO.	OWNER	ADDRESS	TOTAL D[illegible]	LENGTH OF CASING	STATIC WATER ELEV.	USE	SOURCE OF [illegible]RMATION
57	Amoco	Carteret, NJ	19'	3'	NR	6	Handex Corp.
58	Amoco Oil	Carteret, NJ	12'	1'	NR	6	Handex Corp.
59	Esso Standard oil Co.	P.O. Box B, Bayonne, NJ	505'	114-252'	12'	T	H.J. Stothoff
60	Pengad Inc.	55 Oak Street, Bayonne, NJ 07002	14'6"	7'6"	9'6"	6	Jenny Engineering Corp.
61	Pengad Inc.	55 Oak Street, Bayonne, NJ 07002	14'6"	5'	NR	6	Jenny Engineering Corp.
62	Amoco Oil Company	150 S. Warner Road, King of Prussia, PA	19'	NR	10'	6	Handex Corp.
63	Hemlock Realty	55 Oak Street, Bayonne, NJ	21'	NR	8'	6	Tabasco Drilling Corp.
64	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	10.5'	NR	3'	6	James C. Anderson Assoc., Inc.
65	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	14'	NR	6'	6	James C. Anderson Assoc., Inc.
66	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	16'	NR	2'	6	James C. Anderson Assoc., Inc.
67	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	6'	NR	1.5'	6	James C. Anderson Assoc., Inc.
68	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	7'	NR	2'	6	James C. Anderson Assoc., Inc.
69	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	16'	NR	4'	6	James C. Anderson Assoc., Inc.
70	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	10.5'	NR	4'	6	James C. Anderson Assoc., Inc.
71	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	16.5	NR	8'	6	James C. Anderson Assoc., Inc.
72	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	12.5'	NR	3'	6	James C. Anderson Assoc., Inc.
73	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	12.5'	NR	2'	6	James C. Anderson Assoc., Inc.
74	International Tank Matex	321 S.D. Charles Ave., New Orleans, LA 70130	12.5'	NR	4'	6	James C. Anderson Assoc., Inc.
75	Getty Petroleum Corp.	Avenue C, Bayonne, NJ	15'	5'	7'	6	Split Spoons
76	Getty Petroleum Corp.	Avenue C, Bayonne, NJ	14'	4'	11'	6	Split Spoons
77	Getty Petroleum Corp.	Avenue C, Bayonne, NJ	13.5'	3.6'	9'	6	Split Spoons
78	PSF&G Property	Bayonne, NJ	25'	20'	NR	6	Testwell Craig Test Boring Co., Inc.
79	PSF&G Property	Bayonne, NJ	155'	150'	NR	6	Testwell Craig Test Boring Co., Inc.
80	PSF&G Property	Bayonne, NJ	65'	60'	NR	6	Testwell Craig Test Boring Co., Inc.
81	PSF&G Property	Bayonne, NJ	130'	125'	NR	6	Testwell Craig Test Boring Co., Inc.
82	PSF&G Property	Bayonne, NJ	69'	64'	NR	6	Testwell Craig Test Boring Co., Inc.
83	PSF&G Property	Bayonne, NJ	40'	35'	NR	6	Testwell Craig Test Boring Co., Inc.
84	PSF&G Property	Bayonne, NJ	25'	20'	NR	6	Testwell Craig Test Boring Co., Inc.
85	PSF&G Property	Bayonne, NJ	55'	50'	NR	6	Testwell Craig Test Boring Co., Inc.
86	PSF&G Property	Bayonne, NJ	10'	5'	NR	6	Testwell Craig Test Boring Co., Inc.
87	PSF&G Property	Bayonne, NJ	65'	60'	NR	6	Testwell Craig Test Boring Co., Inc.
88	PSF&G Property	Bayonne, NJ	35'	30'	NR	6	Testwell Craig Test Boring Co., Inc.
89	PSF&G Property	Bayonne, NJ	20'	15'	NR	6	Testwell Craig Test Boring Co., Inc.
90	PSF&G Property	Bayonne, NJ	10'	5'	NR	6	Testwell Craig Test Boring Co., Inc.
91	PSF&G Property	Bayonne, NJ	130'	125'	NR	6	Testwell Craig Test Boring Co., Inc.
92	PSF&G Property	Bayonne, NJ	45'	40'	NR	6	Testwell Craig Test Boring Co., Inc.
93	PSF&G Property	Bayonne, NJ	35'	30'	NR	6	Testwell Craig Test Boring Co., Inc.
94	PSF&G Property	Bayonne, NJ	16'	11'	NR	6	Testwell Craig Test Boring Co., Inc.
95	PSF&G Property	Bayonne, NJ	33'	28'	NR	6	Testwell Craig Test Boring Co., Inc.
96	PSF&G Property	Bayonne, NJ	67'	62'	NR	6	Testwell Craig Test Boring Co., Inc.
97	PSF&G Property	Bayonne, NJ	23'	18'	NR	6	Testwell Craig Test Boring Co., Inc.
98	PSF&G Property	Bayonne, NJ	25'	20'	NR	6	Testwell Craig Test Boring Co., Inc.
99	PSF&G Property	Bayonne, NJ	25'	20'	NR	6	Testwell Craig Test Boring Co., Inc.
100	PSF&G Property	Bayonne, NJ	25'	20'	NR	6	Testwell Craig Test Boring Co., Inc.
101	PSF&G Property	Bayonne, NJ	40'	35'	NR	6	Testwell Craig Test Boring Co., Inc.
102	PSF&G Property	Bayonne, NJ	15'	10'	NR	6	Testwell Craig Test Boring Co., Inc.
103	PSF&G Property	Bayonne, NJ	25'	20'	NR	6	Testwell Craig Test Boring Co., Inc.
104	PSF&G Property	Bayonne, NJ	40'	35'	NR	6	Testwell Craig Test Boring Co., Inc.
105	PSF&G Property	Bayonne, NJ	75'	70'	NR	6	Testwell Craig Test Boring Co., Inc.
106	PSF&G Property	Bayonne, NJ	35'	30'	NR	6	Testwell Craig Test Boring Co., Inc.
107	PSF&G Property	Bayonne, NJ	60'	55'	NR	6	Testwell Craig Test Boring Co., Inc.
108	PSF&G Property	Bayonne, NJ	55'	50'	NR	6	Testwell Craig Test Boring Co., Inc.
109	PSF&G Property	Bayonne, NJ	65'	60'	NR	6	Testwell Craig Test Boring Co., Inc.
110	PSF&G Property	Bayonne, NJ	22'	17'	NR	6	Testwell Craig Test Boring Co., Inc.
111	PSF&G Property	Bayonne, NJ	100'	95'	NR	6	Testwell Craig Test Boring Co., Inc.
112	PSF&G Property	Bayonne, NJ	54'	49'	NR	6	Testwell Craig Test Boring Co., Inc.

TABLE 2-1 Well Search, Bayonne Industries Bayonne, New Jersey

NO.	OWNER	ADDRESS	TOTAL D.	LENGTH OF CASING	STATIC WATER ELEV.	USE	SOURCE OF ORMATION
113	PSF&G erty	Bayonne, NJ	15'	10'	NR	6	Testwell Craig Test Boring Co., Inc.
114	Amoco Oil	Carteret, NJ	17'	2'	10'	6	Handex Corp.
115	Amoco Oil	Carteret, NJ	18'	3'	10'	6	Handex Corp.
116	Amoco Oil	Carteret, NJ	16'6"	1'6"	10'	6	Handex Corp.
117	Amoco Oil	Carteret, NJ	14'	1'	9'	6	Handex Corp.
118	Amoco Oil	Carteret, NJ	19'	3'	10'	6	Handex Corp.
119	Amoco Oil	Carteret, NJ	19'	3'6"	10'	6	Handex Corp.
120	Amoco Oil	Carteret, NJ	19'	2.80'	10'	6	Handex Corp.
121	Amoco Oil	Carteret, NJ	19'	2.80'	10'	6	Handex Corp.
122	Amoco Oil	1505 S. Warner Rd., Kinf of Prussia, PA	17.80'	2.80'	10'	6	Handex Corp.
123	Hemlock Realty	55 Oak Street, Bayonne, NJ	20'	5'	18'	6	Tabasco Drilling Corp.
124	Bayonne City	Oak Court, Bayonne, NJ	16.5'	11'	12.5'	6	John Mathes & Associates
125	Bayonne City	Oak Court, Bayonne, NJ	20'	7'5"	8'	6	John Mathes & Associates
126	Bayonne City	Oak Court, Bayonne, NJ	16'	6'	10.5'	6	John Mathes & Associates
127	Bayonne City	Oak Court, Bayonne, NJ	20'	7'5"	11.5'	6	John Mathes & Associates
128	Bayonne City	Oak Court, Bayonne, NJ	22'	7'	11'	6	John Mathes & Associates
129	Bayonne City	Oak Court, Bayonne, NJ	24'	6'	11.2'	6	John Mathes & Associates
130	Bayonne City	Oak Court, Bayonne, NJ	18'	4'	12'	6	John Mathes & Associates
131	Exxon Company USA	P.O. Box 4415, Houston, TX 77210	18'	3'	4'	6	Handex Corp.
132	Exxon Company USA	P.O. Box 4415, Houston, TX 77210	18'	3'	4'	6	Handex Corp.
133	Exxon Company USA	P.O. Box 4415, Houston, TX 77210	18'	3'	4'	6	Handex Corp.
134	Exxon Company USA	P.O. Box 4415, Houston, TX 77210	18'	3'	4'	6	Handex Corp.
135	Bayonne Hospital	630 Broadway Avenue, Bayonne, NJ	16'	5'8"	8'	6	B&B Drilling, Inc.
136	Bayonne Hospital	630 Broadway Avenue, Bayonne, NJ	18'	7'8"	9'	6	B&B Drilling, Inc.
137	Bayonne Hospital	630 Broadway Avenue, Bayonne, NJ	12'	6'8"	NR	7	B&B Drilling, Inc.
138	Bayonne Hospital	630 Broadway Avenue, Bayonne, NJ	12'	6'8"	NR	7	B&B Drilling, Inc.
139	Mobay Chemical Corp.	P.O. Box 419, Bayonne, NJ 07507	NR	NR	NR	6	Warren George, Inc.
140	Mobay Chemical Corp.	P.O. Box 419, Bayonne, NJ 07507	NR	NR	NR	6	Warren George, Inc.
141	Mobay Chemical Corp.	P.O. Box 419, Bayonne, NJ 07507	NR	NR	NR	6	Warren George, Inc.
142	New Jersey Bell	65 Park Avenue, Bayonne, NJ	20'	5'	NR	NR	Empire Soils Investigations
143	New Jersey Bell	65 Park Avenue, Bayonne, NJ	20'	5'	NR	NR	Empire Soils Investigations
144	Bayonne Block Co., Inc.	Hook Road At Ave. H., Bayonne, NJ	15'	7'	6'	6	Advanced Environmental Boring
145	IMTT	E. 22nd Street & Bay Street, Bayonne, NJ 07022	52'	52'	None	B	Warren George, Inc.
146	IMTT	E. 22nd Street & Bay Street, Bayonne, NJ 07022	50'	50'	None	B	Warren George, Inc.
147	IMTT	E. 22nd Street & Bay Street, Bayonne, NJ 07022	52'	52'	None	B	Warren George, Inc.
148	IMTT	E. 22nd Street & Bay Street, Bayonne, NJ 07022	27'	27'	None	B	Warren George, Inc.
149	IMTT	E. 22nd Street & Bay Street, Bayonne, NJ 07022	27'	27'	None	B	Warren George, Inc.
150	Jeryl Industries, Inc	590 Belleville Turnpike, Kearny, NJ 07032	19.5'	14.5'	NR	6	Converso Construction
151	Jeryl Industries, Inc	590 Belleville Turnpike, Kearny, NJ 07032	18'	15'	NR	6	Converse Construction
152	Jeryl Industries, Inc	590 Belleville Turnpike, Kearny, NJ 07032	18.5'	15'	NR	6	Converse Construction
153	Jeryl Industries, Inc	590 Belleville Turnpike, Kearny, NJ 07032	18'	15'	NR	6	Converse Construction
154	Jeryl Industries, Inc	590 Belleville Turnpike, Kearny, NJ 07032	19.5'	14.5'	NR	6	Converse Construction
155	Jeryl Industries, Inc	590 Belleville Turnpike, Kearny, NJ 07032	19'	14'	NR	6	Converse Construction
156	Jeryl Industries, Inc	590 Belleville Turnpike, Kearny, NJ 07032	17.5'	15.5'	NR	6	Converse Construction
157	I.C.L. United States Inc.	East 22nd Street & Ave. J., Bayonne, NJ 07002	85'	80'	NR	NR	New York Co., Inc.
158	PSF & G Property	Bayonne, NJ	23'	18'	NR	6	Testwell Craig Test Boring Co., Inc.
159	Tide Water Oil Co.	Bayonne, NJ	1397'	NR	NR	NR	NR

NR – Not Reported
B – Boring
T – Test
0 – Gas Vent
6 – Monitoring
7 – Piezometer

Since 1993 the facility has undergone a dramatic rehabilitation. Portions of the facility continue to be leased to various other tenants, primarily warehouse operators, but also including the Co-Gen Electric and Steam Generating Facility.

2.2.2 Past and Present Tenants

Among the tenants who have occupied portions of the Bayonne industries site since 1956 are the following (Note: entities marked with an * are current lessees at the Bayonne Industries site):

- *Manufacturing Operations:* White Chemical Corporation (Yard 1), Rona Pearl, Inc. and interim owner Whitaker Company (Yard 8), Southern California Chemical Company and CO-GEN Technologies, Inc. (Yard 10);

- *Service Organizations:* Universal Air Freight*, Saybolt Testing Laboratories*, SCS Control Services*, Gerry Courain Electrician, and Nicaretta Construction Company;

- *Tallow and Vegetable Oils Storage:* Allied Vagetable Oils, Theobald Industries, Standard Tallow Corporation, and Capital City Products (all in Yard 2), Industrial fats (offloading in Yard 4), and Metropolitan Rendering Company (Yard 3); and

- *Trucking and Warehousing:* Four Jays Distribution Corporation, Cook Warehouse Enterprises, Votainer Consolidation services, Pittston (trucking division) and successor Ultramar, Bayonne Freight Warehouse, Coviello Transportation Company, and Mid-States Distribution Company*.

The following subsections present additional information on some of the more prominent manufacturing tenants based on second-hand information gleaned from relevant documents and hearsay.

2.2.2.1 White Chemical

The White Chemical Corporation leased approximately 3.5 acres of the site in Yard 1 eastward of Tanks 1702-4. The approximate boundaries of this site are shown on the Site Plan, in Appendix A. White Chemical operated at this site from approximately 1961 through 1983 in a facility that included a diked bulk storage area, a trailer office, a brick process building, and an open yard for traffic and materials storage. The company is reported to have been involved in the manufacture of a number of chemicals including among others various halogenated hydrocarbon compounds. Waste products which may be surmised to have been generated during these operations would include hydrochloric acid, distillation bottoms, filter aids, organic

sludges, solvents and wastewaters. Details on how these were disposed of are not available but photographic evidence exists of their accumulation in drums which were subsequently hauled offsite. There are indications that in about 1980, a number of 7500 gallon aboveground fiberglass storage tanks were put in place at the site to handle saleable by-products and wastewaters prior to suitable off-site disposal.

Following a report of some spills at the site by White Chemical to NJDEP, an Administrative Consent Order (ACO) was issued to White Chemical by the Department to determine the extent of site contamination and the confection of an appropriate remedial action plan.

Reference is made to an October 1988 site summary prepared by Clare Sullivan, NJDEP, which chronicled White's operations and reviewed several sampling events conducted at the White site:

a. A June 26, 1977 report prepared by Environmental Science and Engineering presented analytical results from samples of soil, surface water and sediments from nearby waterways, algae, fish and human hair finding the presence of some halogenated materials above detection limits. Soil samples from unspecified locations taken in 1981 were reported to indicate some presence of benzene, nitrobenzene, phenols, toluene and 2-chloronaphthalene. Sampling for dioxins in June of 1983 did not indicate their presence at or above the detection limit of 1.7 ppb.

b. DEP collected two surface soil samples in July 1983 in the vicinity of a drum pad and indications of metals and brominated hydrocarbons were reportedly found. Ultimately, some 58 soil samples were collected in November of 1987 around the site. At White Chemicals insistence, DEP denied Bayonne Industries the requested opportunity to take split samples at this time. We understand their were some quality control concerns over these analytical results, but the results we have seen indicate what contamination was found was confined to the aforementioned chemical storage area to the north of the process building. During this period, IMTT-Bayonne suspended plans to use the site as a truck loading area but requested and received from the state approval for passive use as a marshalling yard and other low impact activities.

In 1983, White Chemical moved its operations to Newark, New Jersey and all drums, wastes, tanks, process equipment, and other materials were removed from the site. Bayonne Industries brought legal action against White and the former owners to see completion of the ACO responsibilities, but bankruptcy was granted to White Chemical. Bayonne Industries is assuming oversight of this matter in the setting of this MOA pending alternative directions.

2.2.2.2 Southern California Chemical Company

Background records indicate that Southern California Chemical Company leased a site in Yard 10 from Bayonne Industries for approximately 8-10 years in the 1972-1981 period. Their activities appear to have been associated with the recycle recovery of copper from old electronic parts in a building identified in the 1948 Tidewater site plan as the "Plate Shop" building. This building was demolished when Yard 10 was leased to CO-GEN Technologies in 1985 and is presently covered by concrete underlying CO-GEN's main building, cooling towers, a storage shed and two bulk storage fuel oil tanks.

The USEPA conducted a facilities inspection of the site on June 24, 1981 as the SCC operation was closing down. Much of the equipment had then been removed from the site leaving some 50 drums of copper/iron residues awaiting shipment to their Texas plant. Washwater to be used in cleaning and dismantling the eight remaining tanks on the site was to be collected in a concrete pit prior to disposal at a licensed facility. An alternate drain from the pit was reportedly linked to a storm sewer. A follow-up inspection by US EPA in May 1982 indicated that all drums and tanks had been removed, that the process building was empty with one 6-inch square blue stain in one area of the building.

2.2.2.3 Rona Pearl

Rona Pearl, ultimately a division of EM Industries, Inc. began operations in the early 70's as a leaseholder at the Bayonne Industries site. Their manufacture of nacreous (luminescent) pigments for the cosmetics industry continued through an interim ownership by Whitaker Corporation prior to their acquisition by EM who returned to the use of the Rona name. The Site Plan of their operations north of Yard 3 and identified in this RI as Yard 8 is shown in Appendix A. Rona's entire site was paved and all discharges converged to a 5,000 gallon holding tank which was part of their NJPDES permitted treatment train. Reagents stored at the facility included nitric acid, butyl acetate, methanol, ammonia and both halogenated and non-halogenated solvents.

Rona Pearl terminated its lease under ISRA oversight on July 31, 1996 (Case No. 94100). Rona Pearl had a NJPDES surface water discharge permit NJ0030449 to the Platty Kill Canal throughout its recent operations.

2.2.2.4 CO-GEN Technologies

CO-GEN Technologies, Inc. has successfully developed the energy-conservation cogeneration technology at their 10 acre Bayonne site, beginning operations with their leasehold effective June 13, 1985. Their operations drive electric generators off of high-pressure steam generated onsite from which low-pressure steam is dispatched to a number of industrial operations in the Constable Hook area. A careful site assessment was conducted on their property prior to the initiation of construction and no further work under the MOA is planned in this "Yard 10" of the Bayonne Industries site.

2.2.3 Previous Investigations

There have been relatively limited environmental investigations conducted at the site. Two known prior groundwater investigations have been identified. The first was a hydrogeologic investigation of subsurface conditions and the migration of floating product on the Bayonne Industries property conducted in 1978 by Roy F. Weston, Inc., with subsequent design and implementation of an oil recovery system. This investigation and subsequent free-product recovery program was implemented as a result of a 1978 ACO which required Bayonne Industries to investigate the extent of free-oil on the water table below the site and implement a free-oil recovery program. This ACO was allowed to lapse based on monitoring results in the mid 1980's.

The second investigation was initiated as an adjunct requirement of Bayonne Industries NJPDES/Discharge to Groundwater Permit. A monitoring well network was installed as part of the program for the purpose of detection monitoring. The present work is a successor to this initial monitoring.

2.2.3.1 1978 Hydrogeologic Investigation

As indicated in the 1978 Roy F. Weston report, the objectives of the hydrogeologic investigation conducted in 1978 were to:

- Define the nature and distribution of natural subsurface deposits and fill material.
- Define the areal extent and thickness of oil which had seeped into the groundwater.
- Establish the groundwater table and define the groundwater flow system and hydraulic gradient(s) in the area.

- Determine the hydrogeologic controls on the occurrence and migration of the oil.
- Assess the feasibility of such alternatives as interceptor wells or sump trenches for oil recovery prior to seepage into the Kill van Kull.
- Recommend technically sound and cost-effective alternatives for implementation as long-term control measures.

The results of this investigation were presented in the RIWP as Appendix G, "Hydrogeologic Investigation of the Subsurface Occurrence of Oil and Alternative Recovery Methods." This investigation and subsequent free product recovery included the installation of over 70 groundwater monitoring wells and recovery wells throughout the site. It was reported that, based on results of the 1978 investigation, recovery of free product on the water table was initiated in 1979; by 1981 as much as 80 percent of the recoverable free product had been removed, and data collected in 1983 indicated that the free product had reportedly been substantially removed.

In January 1990, Bayonne Industries conducted a visual survey of all wells associated with this investigation, the majority of which were not able to be located. A well location and abandonment program was conducted during the Phase 1 RI, the results of which are presented in Section 6-10 of this report.

2.2.3.2 NJPDES DGW Monitoring Program

In accordance with a NJDEP, Division of Water Resources approved groundwater monitoring plan, Bayonne Industries installed ten groundwater monitoring wells (MW-1 through MW-10) at the site in March 1990. Initial results indicated six of the ten wells contained free-floating product. In July 1990, Bayonne Industries installed 8 additional wells (MW-11 through MW-18), and in December 1990 installed 11 additional wells (MW-19 through MW-29). Monitoring well MW-29 was installed to replace monitoring well MW-14 which had a damaged casing. Monitoring well MW-14 was properly abandoned and documented on June 14, 1991, in accordance with NJDEP specifications. All monitoring wells installed during this program were reportedly constructed in accordance with NJDEP specifications, applicable at the time of installation. All monitoring wells were installed to monitor the shallow water bearing zone found above the meadow mat.

Five rounds of groundwater samples were collected from these wells between May 10, 1990 and February 28, 1992 to evaluate groundwater quality. All samples collected were analyzed for volatile organic compounds only. Eleven wells had no groundwater quality data available because of the presence of free-phase product during all five sampling events.

The most frequently detected compounds were benzene, total xylenes, and toluene. Benzene was detected above the groundwater quality criteria in 27 of the 36 total samples analyzed. Benzene concentrations in groundwater ranged from 1 to 10,854 ug/L. The highest concentration of benzene was detected in monitoring well MW-27. Total xylenes were detected in 20 of 36 total samples analyzed. Of these samples, 8 of the 36 total xylenes concentrations were above the Class IIA Groundwater Quality Criteria of 40 ug/L. The highest concentration of total xylenes was also detected in monitoring well MW-27. Toluene was found in 15 of 36 samples analyzed, with groundwater samples from monitoring well MW-27 exhibiting the highest concentration. Of the 15 samples where toluene was detected, four were identified having concentrations above the 1,000 ug/L groundwater quality criteria.

Based on this data, monitoring well MW-27, located near the railroad Roundhouse, exhibits the highest concentrations of groundwater contamination and contained compounds including vinyl chloride, chloroform, and trans-1,2-dichloroethene which were not detected in any other wells from which groundwater samples were collected. It should also be noted that monitoring well MW-27 is also located immediately downgradient of the White Chemical leased area.

A more detailed overview of the groundwater quality and identification of free-phase product in the monitoring wells, including the results of samples collected during these Phase 1 RI activities are provided in Section 6.

2.2.4 Aerial Photograph Interpretation

Vertical aerial photographs of the site and surrounding area were acquired from Robinson Aerial Surveys, Inc. and were enlarged to a scale of 1" = 200' on 36-inch by 48-inch photographic paper. Seven vertical photographs were selected for interpretation and review dating from 1947, 1959, 1963, 1970, 1977, 1984, and 1989. The 1947 photograph is the earliest vertical photograph available and does not date back to when the site was naturally vegetated.

A chronological summary of observations including major changes in tankage, surface impoundments, tenant areas, drum storage, etc., are presented in narrative form. A set of the photographs will be forwarded to the NJDEP for review.

2.2.4.1 Yard 1: 1947 - Current

1947

In the 1947 aerial photograph, 89 above-ground storage tanks (AGSTs) can be identified in Yard 1. Of the 89 AGSTs identified, 33 remain on site today.

An operations portion of the facility existed near the northwest corner of Yard 1. This operational area extended into what is now known as the White Chemical area. This operational area was located where Tanks 1702, 1703 and 1704 are currently located. Based on the 1948 site plan this operational area was identified as Combination Unit No. 7. Structures identified in this unit included a Red Crude Heater, Cracking Cases, Topping Heater, Heat Exchange Structure, Turbo Compressor, Control Room and exchange structure. The red crude heater, and cracking cases were located where Tanks 1702, 1703 and 1704 are currently located. The remainder of Unit No. 7 was located in the area currently known as the White Chemical area.

One building was identified in the photos southwest of the present Tank 1701 location. The 1948 site plan identifies this building as a pump house. A second building was located southwest of what is currently Tanks 1102 and 1066 locations. The 1948 site plan also identifies this building as a pump house with a gasoline manifold adjoining the building on the east side and a fuel oil manifold adjoining the west side. The two manifolds are clearly evident in the aerial photo. Two additional buildings were identified southwest of the current Tank 1700 location. These buildings are on the 1948 site plan; however, the identifiers are not readable. In the center of the yard, what appears to be two attached buildings were identified northwest of the current Tank 1105 location. On the 1948 site plan the north building is identified as a pump blower house, and the southern building as "Orifices Treaters". Immediately south of the orifices treaters building are four horizontal tanks which are identified as "settlers" in the 1948 site plan. Along the Kill van Kull, one building was identified adjacent to where the compound building in Yard 2 is currently located. This building is identified as Warehouse No. 1 on the 1948 site plan. An additional building, situated south of Tank 1700, can be identified at the location of the existing Electric Storage Building. This building is identified as a Locker Room on the 1948 site plan. Four buildings were located in the northwest corner of the yard north of Combination Unit No. 7. These are identified as the Engine House, Wash and Locker Room, Salvage Department, and a Paint Shop on the 1948 site plan. The building identified as the Engine House is presently known as the Round House building.

There are two piers evident in the 1947 photo. One approximately 550 feet in length is identified on the 1948 Site Plan as Pier No. 1. This pier is still active today. The second one, approximately 200 feet in length is identified as Pier A in the 1948 Site Plan. Remnants of this structure are still present at the site; however, the pier is not used.

1959

In the 1959 aerial photograph, 67 AGSTs were identified. Forty of the 67 AGSTs identified remain on site today; six of these AGSTs were erected between 1947 and 1959. Nineteen AGSTs were removed from the northeast corner of the yard in the immediate vicinity of what is currently tank

1701. Four of the "new" tanks were erected in this area. One AGST, located immediately south of tank 1102, was no longer present. Additionally, Tank 1700, which remains today, replaced eight AGSTs in the center of the yard.

By 1959, the Combination Unit No. 7 operational area identified in the 1947 photo including all buildings and tanks associated with it was no longer present. One new building was erected in this area. All of the other buildings identified in the 1947 aerial photograph were still erect in 1959. Both piers identified in the 1947 aerial photo were still present on the 1959 photo, although the shoreline immediately west of Pier A has changed significantly.

1963

In the 1963 aerial photo, 52 AGSTs can be identified in Yard 1, 42 of which exist today. Three AGSTs (1702, 1703 and 1704) were erected between 1959 and 1963 in the area previously identified as the Combination Unit No. 7 area. Those tanks abut the western boundary of the White Chemical area. During the period from 1959 to 1963, nine AGSTs were removed from the area east of Tank 1700 and south of Tank 1701. The six tanks that were located at the north end of the White Chemical area are no longer present.

The buildings identified previously as a pump blower house and the orifices treaters, along with the four horizontal settler tanks, were no longer present. It appears that the nine AGSTs that were present immediately west of these buildings were removed and replaced by new tanks that were erected at six of the nine former locations. Tank 1701 was erected at some time between 1959 and 1963. This tank was erected in the northeast corner of Yard 1, immediately northeast of the building previously identified as a pump house. This pump house building is not present in the 1963 photo.

Three of the four buildings that were identified in the 1947 and 1959 photos, which were located in the northwest corner of Yard 1, north of the Combination Unit No. 7 area, were no longer present in the 1963 photo. These included the Washer and Locker building, the Salvage Department building, and the Paint Shop. The Engine House remains. Along the Kill van Kull, the building identified as Warehouse No. 1 was no longer present. Both Piers 1 and A are still present. Pier A appears to have been completely renovated.

1970

Fifty-two AGSTs were identified in the 1970 aerial photograph; forty-three of these AGSTs remain on site today. Tank 1710, which had been removed between 1959 and 1963, was replaced at sometime between 1963 and 1970. This tank is still on site today. One tank, located southwest

of the Electric Storage Building, was no longer present; standing water can be seen in this area in the 1970 photo. This area is south of tank 1700 and southwest of the building previously identified as a pump house with two adjoining manifold systems. According to historical aerial photographs, only one building, located southwest of Tank 1700, was removed between 1963 and 1970. An area of standing water appears to be present within the northwest corner of the Tank 1701 dike area. The White Chemical facility appears to be in full operation at this time.

At the waterfront on Yard 1 new above ground piping runs are clearly evident, and Piers 1 and A are still present. The shoreline immediately west of Pier A has changed once again, with land that had been previously submerged or eroded away, now re-emerging.

1977

No changes in the number or location of AGSTs are evident from 1970 to 1977, all buildings identified in 1970 remain in 1977, however, the areas of standing water identified southwest of the Electric Storage Building and northwest of tank 1701 in the 1970 photograph, does not appear in the 1977 aerial photograph. The White Chemical operation is still clearly evident, and appears to have expanded. The waterfront area remains unchanged.

1984

Fifty-one AGSTs were identified in the 1984 aerial photograph, with 40 of these AGSTs remaining on site today. One horizontally-orientated AGST was added next to Tanks 1122 and 1123, and two AGSTs were removed south of Tank 1700. The building previously identified as a pump house with two adjoining manifolds, located southwest of Tanks 1066 and 1102, is no longer present. There is no standing water evident anywhere in Yard 1. The White Chemical operation appears to have ceased and all drums, containers and other matter present in the 1970 and 1977 photographs are no longer evident.

1989

Forty-four AGSTs are present in Yard 1. Seven AGSTs north of Tank 1700, and one tank south of Tank 1102 were removed at sometime between 1984 and 1989. The same buildings identified in 1984 were also present in the 1989 aerial photograph.

2.2.4.2 Yard 2: 1947 - 1989

1947

In 1947, aerial photographs show approximately 115 AGSTs in Yard 2. Approximately 63 of the 115 AGSTs are still standing in Yard 2 today. Eight of the 115 AGSTs are horizontal tanks located immediately south of the Platty Kill Pond. Additionally, 18 buildings were identified in the 1947 photo. As indicated in the 1948 site plan these included the Main Office/Engineering Department, Restaurant, Cafeteria, Research Laboratory, Automotive Testing Laboratory, Boiler House/Power Station/Turbo Alternator Complex, Auto Repair/Machine Shop/Box Shop Complex, Electric Shop/Marine Store Room, Hot Room, Compound Building, Filled Carton Storage, Six Pump Station, Warehouse, and No. 2 Warehouse. Six of these 18 buildings currently exist on site and include: the compound building, the boiler house, the main office building, and two buildings northeast of the main office. These two buildings were formerly known as the Automotive Research Laboratory and the Research Laboratory.

At the waterfront in Yard 2, four piers are present, identified from east to west in the 1948 Site Plan as Pier No. 4, Pier No. 3, Coal Pier and Pier No. 2. The buildings identified as No. 2 Warehouse is located immediately north and between piers 3 and 4. The building identified as warehouse is immediately north of Pier 4. Pier No. 4 also has a building structure on it's entire length. The electric shop/marina store room is located north of the coal pier. The six pump stations and filled carbon storage building are located north and between the coal pier and Pier No. 2. The compound building is located immediately north of Pier No. 2 and immediately adjacent to the filled carbon storage building to the east and Warehouse No. 1 in Yard 1 to the west. The Hot Room building is north of the compound building and the Auto Repair/Machine Shop/Box Shop complex is located east of the Hot Room building. The No. 2 Warehouse building has eight cylindrical AGSTs adjoining its west wall, and a series of 18 AGSTs immediately north of the building. Yard 2 abuts the Platty Kill Pond and Canal, which for purposes of this report are identified as Yard 9, and will be discussed later.

1959

Changes occurred in Yard 2 between 1947 and 1959. Approximately 101 AGSTs were identified in the 1959 aerial photograph. Currently, 73 of the 101 identified remain on site today. Between 1947 and 1959, five of eight horizontally-oriented AGSTs located next to the Platty Kill Pond were removed and it appears that 10 new AGSTs were erected in the vicinity of the Platty Kill Pond and Canal.

The building identified as No. 2 Warehouse, and the tanks associated with it (18 to the north and

8 adjoining its west wall) are no longer present. The Electric Shop/Marine Storage building, and the Filled Carton Storage building are no longer present. A large L-shaped building has been erected at the waterfront, at the head of Piers 3 and 4 and the coal pier. A series of 14 cylindrical AGSTs have been erected immediately north of this new building This building is presently known as the P&S building. The machine shop is still present; however, the automotive repair shop and box shop that were part of this building complex, are no longer present. A new building was erected south of the research laboratory.

1963

Only minor changes were noted in Yard 2 between 1959 and 1963. In the 1963 aerial photograph, approximately 105 AGSTs were identified in Yard 2. Seventy-five of the 105 AGSTs are on site today.

Activities between 1959 and 1963 appear to include the installation of four additional AGSTs and the removal of the restaurant building which was located south of the main building.

1970

Minor changes were noted in Yard 2 between 1963 and 1970. In 1970, 95 AGSTs were identified, 75 of which remain today. Between 1963 and 1970, ten AGSTs were removed. Two of the AGSTs removed were located near the northeast corner of the P&S Building, adjacent to the Platty Kill Canal. Other AGSTs removed included two located in the center of the yard, next to existing Tanks 2153 and 2142; one adjacent to the hot house; one near the research laboratory; and four north of the machine shop building.

1977

In the 1977 aerial photograph, approximately 94 AGSTs were identified, 75 of which remain on site today. Between 1970 and 1977, one AGST was removed from the area southeast of Tank 2140. The building identified as the machine shop was also removed.

1984

Ninety-one AGSTs were identified in the 1984 photograph. Seventy-five of these tanks remain in Yard 2 today.

Between 1977 and 1984, several above-ground pipelines appear to have been installed. However, it may be that existing pipelines were painted white making them more readily visible

in the aerial photo. During this time period, two buildings and three AGSTs were removed. The buildings that were removed include the boiler house which was located south of the main building and part of the boiler house/power station/turbo alternator building complex. The power station and turbo alternator buildings remain. The second building that was removed was the six pump station located adjacent to the compound building and the coal pier. The three AGSTs removed were located west of the boiler house.

1989

Approximately 89 AGSTs were present in the 1989 aerial photograph. Today, 75 of the 89 AGSTs can be identified. Additionally, eight of the buildings present in the photograph remain today.

In the five-year period between 1984 and 1989, four tanks adjacent to Platty Kill Canal and four tanks north of the Compound Building were removed. One building west of Tank 2142 was removed. Also during this period, the existing Hot Oil House near the center of the yard was erected.

2.2.4.3 Yard 3: 1947 - 1989

1947

Eighty-four AGSTs and 16 buildings were identified in the 1947 aerial photograph. Forty-four of the 84 AGSTs remain in Yard 3 today. The sixteen buildings identified include: four buildings along the center of the northern boundary, identified as Lube Units on the 1948 site plan; one building at the approximate center of the yard's south boundary, identified as the Dispensary/Educational/Employment Department, one building northwest of the Dispensary building identified as a pump house; two buildings northeast of the Dispensary building and west of the Platty Kill Pond identified as the Chiller and Exchanger building, and the Refrigeration Filter and Pump Building; one immediately northwest of the Chiller building, identified as Pump House #31; one large building in the northeast corner of Yard 3 identified as the Edeleanu Building; and two buildings immediately south of this building identified as a Pump House to the east and Weir Building to the west.

There are two transition areas present within Yard 3. The first area is located north of the Chiller Building. This area appears to be the location of the No. 3 Boiler House, based on a 1921 Site Plan. The second area is located along the west border of Yard 3. This appears to be the former location of a series of crude stills as identified on the 1921 site plan. The vacant area immediately north of the building identified as the Dispensary is the former location of a

separator pond that was identified in the 1921 Site Plan. There is no such area on the 1948 Site Plan.

1959

Changes occurred in Yard 3 between 1947 and 1959. In the 1959 aerial photograph, 80 AGSTs were identified; 60 of these AGSTs remain today. Eighteen buildings are also visible in the 1959 photo.

The Edeleanu Building is still present in the northeast corner of Yard three; however, the Weir Building, which was located immediately south of the Edeleanu Building, is no longer present. The tank group immediately south of the Edeleanu building has increased in size from 20 AGSTs to 29, four of which were erected on the site of the former Weir building. The Chiller building appears to have been expanded. A new operational area, most likely the Propane Deasphalting Unit and Furfural Extraction Unit, identified on the 1948 site plan, is present north of the chiller building. This area was formerly the site of Boiler House No. 8. Twelve AGSTs were also removed from this area. The Lube Units that were present along the center of the north yard boundary are no longer present. This area appears to be vacant land. Two buildings were erected north of the Dispensary Building at the south end of the Yard, in the location of the former settling pond identified on the 1921 Site Plan. Six AGSTs were erected west of the building identified as Pump House No. 3 in the center of the Yard, in the area of four AGSTs that were present in the 1947 site plan. The large vacant area along the Yard 3 west border, which was identified in the 1947 photo as the former location of a series of crude stills, remains vacant, although three small to medium sized buildings and aboveground piping has been erected.

1963

Changes have also occurred in the central part of Yard 3 between 1959 and 1963. In the 1963 aerial photograph, 76 AGSTs and 11 buildings were identified. Sixty-four of the 76 AGSTs identified in this photo currently exist on site.

The Edeleanu Building in the northeast corner of the site is still present and the tank area south of this building remains virtually unchanged from the 1959 photo. Five tanks and some sort of operational structure was removed from the area adjoining the south wall of the Chiller Building, west of the Platty Kill Pond. Most of the changes to this Yard occur in the area north of the Chiller Building. The operational area that had been erected north of the Chiller Building between 1947 and 1959 is no longer present. Four large AGSTs have been erected in the northern portion of this area (Tanks 3921, 3922, 3923, and 3924). The area between the Chiller Building and these four new tanks is vacant.

At the southern end of Yard 3, the Dispensary Building is no longer present, replaced by a parking area. The pump house that was located northeast of the Dispensary Building is also no longer present. An aboveground tank that was located immediately west of the Refrigeration Filter and Pump Building, is no loner present. Tractor trailer trucks are evident in the central part of the yard and along the north Yard 3 border, in the area where the Lube units were located.

The area on the western yard boundary remains vacant and growing vegetation is clearly evident. At least one new building was erected in this area.

1970

Only minor changes can be noted between 1963 and 1970 in Yard 3. Sixty-eight AGSTs and 11 buildings were identified in the aerial photograph dated 1970. Sixty-four of these AGSTs exist in Yard 3 today.

From 1963 to 1970, six AGSTs were removed. Those removed include two horizontally-oriented AGSTs located near the center of Yard 3 and two AGSTs located near the northeastern corner of the yard, north of Tank 3838. Also during these seven years, the pump house located immediately south of the Edeleanu Building was removed and one building was erected along the western yard boundary. The western portion of the yard remains vacant, and the tractor trailer activity noted in the center of the yard and in the northern area of the yard in the 1963 photo, is less evident. The vegetation noted on the western portion of Yard 3 in the 1963 photo is not clearly evident in the 1970 photo.

1977

Only minor changes occurred in Yard 3 between 1970 and 1977. Seventy AGSTs were identified in Yard 3 in the 1977 aerial photograph. Sixty-four of those identified in the photo remain in Yard 3 today. Three new horizontal AGSTs are present northwest of the building identified as Pump House No. 31. Also identified in the photo were 12 buildings, one more than was in the 1970 photo.

Between 1970 and 1977, one building was built near the center of Yard 3, west of the building identified as the Refrigeration Filter and Pump Building. There are no signs of the tractor trailer activity previously noted on the central and northern portions of the yard. A new type of truck activity or storage area is evident in the vacant area north of the chiller building. The western portion of the yard remains vacant and vegetation is evident.

1984

One notable change occurred in Yard 3 between 1977 and 1984. This was the presence of a surface impoundment in the central portion of the site. This surface impoundment is present at the site today. In the 1984 aerial photograph, 64 AGSTs were identified, all of which still exist today.

From 1977 to 1984, six AGSTs were removed from near the southern yard boundary to make room for the new surface impoundment. The surface impoundment is associated with the current wastewater treatment system. One building east of the Chiller Building is no longer present. Additional aboveground piping was installed throughout Yard 3. The remainder of Yard 3 remains unchanged between 1977 and 1984.

1989

Sixty-four AGSTs were present in the 1989 aerial photograph. These AGSTs are still present in Yard 3 today. Also identified in the photo were 10 buildings. The buildings identified appear to be the same buildings identified in the 1984 photo. Additional piping in Yard 3 is also visible in the 1989 photo.

2.2.4.4 Yard 4: 1947 - 1989

1947

The aerial photograph from 1947 shows approximately 31 AGSTs in Yard 4, 23 of which were located in the northwestern corner of the yard. Four AGSTs were located along the eastern boundary, two along the southwestern yard boundary, and three along the western boundary. Of these 31 tanks, none remain in Yard 4 today.

A large operational area is located in the southwestern portion of the yard. This operational area appears to be one of the main refinery operations at the site, based on the 1948 site plan. This area included four cracking coils, two bubble towers, a tar cooler, two control pump houses, two heaters, a third pump house, a reactor structure, super heater, gas compressor building, and several other structures and buildings. A large train yard is present in the northeast portion of Yard 4. Other buildings present in Yard 4 include a transfer pump house and manifold north of the operational area; a Wash Room building, Development Department building, stills and four unidentifiable buildings in the southeast corner of the Yard. A separator is evident in the northwest corner of the Yard.

1959

Changes occurred in Yard 4 between 1947 and 1959. In the 1959 aerial photograph 31 AGSTs were identified. None of these tanks remain in Yard 4 today. The large operational area located in the west portion of Yard 4 is not present in the 1959 photograph.

The large train yard is still present in the northeast portion of the yard. It appears that at least one new building has been erected in the southeast portion of the yard. The separator is still evident in the northwest corner of the yard.

1963

Twenty-two AGSTs and 15 buildings can be identified in Yard 4 in the 1963 aerial photograph. Between 1959 and 1963, nine AGSTs were removed from the northwest corner of the yard. Near the main entrance to the site (northeast corner of the yard), three buildings were removed and some type of operational area is present. The buildings identified as the Transfer Pump House and manifold were no longer present in the area north of the former operational area. At least one new building was erected in this area. Also during this time, one building was removed along the southeast yard boundary. The train yard is still present in the northeast portion of the yard and the separator is still present in the northwest corner of the yard.

1970

In the 1970 aerial photograph, 11 AGSTs can be identified, six are in the northwestern corner of Yard 4, two are along the southern border of the yard and three are present along the north border. A total of 12 buildings were also identified. Between 1963 and 1970, six AGSTs were removed from the northwest corner of the yard, and four more were removed from the eastern boundary. During this time period, two buildings were removed, one from the northeastern corner of the yard and one along the northern boundary.

The separator is still present in the northwest corner and the train yard is still present in the northeast portion of the site. The former operational area in the west portion of the yard appears to be heavily vegetated.

1977

Changes also occurred in Yard 4 between 1970 and 1977. In the 1977 aerial photograph, the same 11 AGSTs identified in the 1970 photo are present along with seven buildings.

Between 1970 and 1977, seven buildings were removed. These included five buildings in the southeastern corner of the yard, one building near the center of the yard, and one building from along the eastern boundary. Two buildings were erected, one along the northern yard boundary and one along the eastern boundary. The majority of the yard remains vacant. The separator is still present in the northwest corner and the rail yard is still present on the northwest portion of the site.

1984

Changes occurred between 1977 and 1984. No tanks were identified in Yard 4 in the 1984 aerial photo, one building which currently serves as the main gate house, was identified. Heavy vegetation is visible in the southwest portion of the yard, in the former operational area.

From 1977 to 1984, six buildings were removed from Yard 4. These include two buildings along the eastern boundary, two buildings along the northern boundary, and two buildings along the southern boundary. All structures located near the northeastern corner were also removed. The separator in the northwest corner is no longer present, and all piping and walls separating the former tanks in the northwest portion of Yard 4, are no longer present. A train yard is still present in the eastern portion of the yard, but it's size is substantially reduced.

1989

The 1989 aerial photograph shows that no tanks and three buildings were present. Several railroad tracks located along the eastern yard boundary were also identified.

During the five years between 1984 and 1989, one building, currently identified as the small boiler house, was constructed along the eastern border, one building was erected in the southeastern corner of the yard, and several aboveground pipelines were added.

2.2.4.5 Yard 5: 1947 - 1989

1947

In the aerial photograph dated 1947, it appears that 105 AGSTs were present in Yard 5. Thirty-four of these tanks remain in Yard 5 today. Also identified in Yard 5 was a surface impoundment which still exists today. This surface impoundment, located in the northwest corner of the yard, appears in 1947 as two impoundments divided by an earth dam. Piping directed into the impoundments is also visible in this 1947 photo.

Seven buildings were identified in the 1947 photo, five of which were located near the southeast corner of the yard. These were identified on the 1948 site plan as the Wax Room, Wax Molding Room, two Clay Retorts, and one Pump House. Two additional buildings were located near the southwestern corner of the yard. Based on the 1948 site plan these were identified as a Crude Oil Pump House and Crude Oil Manifold. None of these buildings remain in Yard 5 today. There is a square vacant area south of tanks 5801 and 5802 which is identified as the Constable Hook Cemetery. An area of piping is visible in the photographs near the southeastern corner of the Yard, at the Yard 5 and Yard 8 boundary.

1959

Ninety-seven AGSTs were present in the 1959 aerial photograph. Thirty-four of these AGSTs remain today. The piping located near the southeast corner of the yard in the 1947 photo was removed. However, in the 1959 photo, piping was identified a small distance to the east of the pipes removed. Four buildings in the southeast corner of the yard are no longer present. Buildings removed include the Wax Room, Wax Molding Room, and two Clay Retorts. The pump house in the extreme southeast corner of the yard is still present. However a new operational area appears to have been erected on the site of the Wax Molding building. The Crude Oil Pump House and Crude Oil Manifold are still present in the southwest corner of the yard. The surface impoundment in the northwest corner is present in 1959, however, the earth dike separating the impoundment is no longer present and it appears larger than in the 1947 photo. Two areas of ponded water located just south of the surface impoundment were also visible in the 1959 photo. The ponded water appears to be present in the former locations of two tanks that were removed between 1947 and 1959.

From 1947 to 1959, the following tanks were removed: two AGSTs from along the western yard boundary, two small AGSTs southeast of Tank 5059, one small AGST southeast of Tank 5211, one AGST near the southeast corner, and four horizontal AGSTs in the southeast corner. The cemetery is still present in the yard.

1963

The 1963 aerial photograph shows 69 AGSTs and three buildings in Yard 5. Thirty-four of the 69 AGSTs remain today. The surface impoundment in the northwest corner is still present and contains visible piping. Standing water in the two former tank locations south of the impoundment is also evident in the 1963 photo.

Between 1959 and 1963, 28 AGSTs were removed from various areas of Yard 5. The tanks

removed are as follows: one tank from near the southeastern yard boundary, 11 from south and southwest of Tanks 5211 and 5214, one from southeast of Tank 5059, three tanks from south and southwest of Tank 5059, 11 from the southwestern corner of the yard, and one tank northeast of Tank 5209.

The new operational area identified in the southeast corner of the yard in the 1959 photo is still present on the 1963 photo. Some new activity appears west of this operational area, possibly attributable to a new building in Yard 8. The Crude Oil Pump House and Crude Oil Manifold are still present in the southwest portion of the yard, as is the pump house in the southeast corner.

1970

Fifty-four AGSTs and three buildings were identified in the 1970 aerial photograph. Thirty-four of the AGSTs remain today. The surface impoundment in the northwest corner of the yard is present in the 1970 photo. The size of the impoundment appears slightly larger than in the 1963 photo.

Sixteen AGSTs appear to have been removed between 1963 and 1970. These tanks include: one in the center of the eastern yard boundary, eight near the southeast corner of the yard, one at the center of the northern yard boundary, one tank south of Tank 5076, two tanks southeast of Tank 5211, one tank along the southern yard boundary just east of Tank 5059, and two tanks west of Tank 5059. One AGST was added west-southwest of Tank 5059.

Two areas of standing water are apparent. The first is in a former tank location south of the impoundment. The second area of ponded water appears to be in the dike area of Tank 5077. The operational area identified in the southeast corner of the Yard in the 1959 photo is still present; however, the activity noted west of this location on the 1963 photo is no longer present. The cemetery is still present and heavily vegetated. Areas of vegetation appear throughout Yard 5.

1977

Thirty-six AGSTs and two buildings were identified in the 1977 aerial photograph. Thirty-four of which remain today. The surface impoundment in the northwest corner of Yard 5 appears to be approximately the same size as in the 1970 photo; however, the piping into the impoundment is not as visible. The two former tank locations south of the impoundment appear to have ponded water present. The ponded water noted around Tank 5077 in the 1970 photo is no longer present.

From 1970 to 1977, a number of changes took place. A row of four AGSTs were removed south of the cemetery, a row of six AGSTs were removed from the western side of the cemetery, and six AGSTs were removed from along the southern yard boundary. One tank between Tanks 5073 and 5801 in the center of the northern yard boundary was removed. The pump house building was removed from the southwestern corner of the yard.

The small operational area located in the southeast corner is still present, as is the cemetery, and the pump house in the southeast corner.

1984

In the 1984 aerial photograph, 34 AGSTs were identified, however; no buildings were identified. The surface impoundment in the northwest corner of the yard appears slightly smaller than in 1977 and piping is no longer visible in the area. The two former tank locations south of the impoundment that contained standing water previously are no longer present. The surface impoundment area appears to have been recently graded. An area along the south side of the cemetery has visible standing water.

Between 1977 and 1984, two buildings were removed. These included the Crude Oil Manifold in the southwest corner of the yard and the Pump House in the southeast corner of the yard. The operational area in the southeast corner no longer appears to be present.

1989

In the 1989 aerial photograph, 34 AGSTs and one building were identified. The surface impoundment in the northeastern corner of the yard appears smaller than in 1984. Standing water is visible in the area adjacent to the cemetery and more tank piping is visible throughout the yard in the 1989 photo.

Between 1984 and 1989, piping which was present near the southeastern corner was removed and a series of pipes were installed south of Tank 5211. One tank in the southeastern yard corner was removed and one building north of Tank 5059, near the southwest corner, was built. All existing AGSTs in Yard 5 were installed during or prior to 1947.

2.2.4.6 Yard 6: 1947 - 1989

1947

In the 1947 aerial photograph, the Yard 6 area is essentially vacant. According to the 1948 Site Plan this area was not owned by the Tidewater Oil Company, but appears to be owned by the Central Rail Road of New Jersey. Visible in this area are two buildings in a fenced in area along the eastern yard boundary, west of the Combination Unit No. 7 operational area identified in Yard 1. One building was present near the northeastern yard corner. A tower-like structure was located near the center of Yard 6 and a possible storage area is visible along the northeastern yard boundary.

Approximately half of the Yard 6 western boundary is shoreline. There are three wooden piers present west of the yard; two of which appear to be inactive and one active. It is believed that these piers were operated by the Central Rail Road of New Jersey. The pier closest to the shoreline is actually within the Yard 6 western boundary, and is inactive.

1959

Changes occurred in Yard 6 between 1947 and 1959. Fifteen AGSTs and seven buildings are visible in the 1959 aerial photograph. Two medium-sized buildings were located near the center of the eastern boundary. These include what today is identified as the Foam Building and Garage. One small building is present immediately south of the Garage Building. One small building is present east of Tank 6009, near the corner of Yards 6 and 10. One medium-sized building is present east of Tank 6203. The Salt Water Pump-House and the screen Chamber are present at the southeast corner of the yard, in the vicinity of Pier A in Yard 1. The inlet next to the Yard 6 western boundary appears partially filled in toward the northern end. Standing water appears to be present in the central portion of this filled area. Standing water also appears to be present in the northeast corner of the yard, east of tanks 6008 and 6009, in the vicinity of the small building at the corner of Yard 6 and 10. The southern portion of the yard appeared to be used as a storage area.

Two groups of large tanks were erected between 1947 and 1959 in the northwest portion of the site. These include a group of six (consisting of tanks 6003, 6004, 6005, 6006, 6011 and 6012) on the western portion of this area, and a group of five (consisting of tanks 6002, 6007, 6008, 6009 and 6010) in the central portion of this area. Each of these two tank groups appear to have a concrete wall erected around them for containment purposes. Two small tanks were erected southwest of the tank group containing six tanks. Two additional large tanks, identified as 6203 and 6204, were erected in the central part of the yard. An earthen dike appears to have been

constructed around these tanks. Some sort of drainage path appears to be present, leading from the midpoint of the north wall of the tank group containing five tanks, into the vacant area to the north. A rather large storage area appears to be present in the central portion of the yard, southeast of Tank 6204.

1963

Fifteen AGSTs and seven buildings are present in Yard 6 in the 1963 aerial photograph. The AGSTs identified are the same as those which appear in the 1959 photo. Two areas of standing water are visible in the northeast corner of the yard in the 1963 photo which is in the same approximate location identified in the 1959 photo. The larger of these two areas appears to be partially dry but also appears to be disturbed. What looks like an area of pipe storage is present north of the larger of the two ponded areas.

One building was built southwest of Tank 6012 during the 4-year period between 1959 and 1963, and the small building, located east of Tank 6009 near the corner of Yard 6 and 10, was removed. However, it appears as if another small building was erected immediately east of tank 6009.

The drainage path in the vacant area leading from the tank group containing the five tanks is much larger and more readily apparent on this photo. The open water that was filled in between the pier and shoreline of Yard 6 appears to be more heavily vegetated, with no visible standing water. The large storage area that was present in the 1959 photo, southeast of tank 6204 is no longer present in the 1963 photo, although its former location is readily apparent. The whole area southeast of tank 6204 appears to be fairly well vegetated.

1970

In the 1970 aerial photograph, 17 AGSTs and five new buildings were identified. The diked areas around the AGSTs are not as visible in 1970 as in prior photos. The major change in Yard 6 between 1963 and 1970 is the addition of two large AGSTs in the former area of the storage yard southeast of tank 6204. These two tanks (6205 and 6206) remain on-site today. The small building located south of the garage and the small building southeast of tank 6009,were removed between 1963 and 1970. The fill area by the pier appears to be more heavily vegetated, and there appears to be a new building erected north of the garage building.

A large area of standing water is apparent in the 1970 photo, in the northeast corner of the yard. Additional standing water appears to be present in the diked area around Tanks 6002 and 6008. The drainage path leading from the tank group containing five tanks, into the vacant area to the

north, is no longer present. Although several small drainage paths appear to be present in this vacant area, leading to the large area of standing water present in the northeast corner of the yard.

The two other areas of standing water in the northeast portion of the site noted on the 1959 and 1963 photos, are still present in the 1970 photo, although the larger of the two appears to be smaller in size than in 1963. Additionally, three rectangular shaped areas of standing water appear to be present along the yard boundary between Yards 6 and 10.

1977

The 17 AGSTs identified in the 1970 photo remain visible in the 1977 aerial photograph. Also identified in the 1977 photo were five buildings, including three which remain today. Storage areas are visible near the northeast yard corner and along the eastern boundary between the foam building and garage. A continuous earthen dike has been constructed to encompass Tanks 6203, 6204, 6205 and 6206. The area within the diked appears to have been recently graded and the entire area has a much neater appearance than in the 1970 photo. A new aboveground pipeline is visible within the newly diked area.

The standing water noted in the dike area of Tanks 6002 and 6008, is no longer present. The large area of standing water located in the northeast corner of the yard in 1970 is no longer present; however, its location is readily apparent in the 1977 photo. The three rectangular bodies of standing water along the boundary between Yard 6 and 10 are still present in the 1977 photo. The smaller of the two areas of irregularly shaped ponded water east of tank 6008, in the northeast portion of the yard, is still present. The larger of the two areas is no longer present; however, its former location is readily apparent in the 1977 photo.

1984

In the 1984 aerial photograph, 17 AGSTs are present and still exist today. Five buildings are also present in the 1984 photo. The small building north of the garage is no longer present, nor is the storage area between the foam building and garage. A small area of ponded water has reappeared in the northeast corner of the yard, at the same location of the larger area of ponded water identified in the 1970 photo.

The three rectangular shaped areas of ponded water along the Yard 6 and 10 boundary are no longer present, nor is the small irregular shaped area. The entire northeast corner of the yard has been generally cleaned up and appears to have been recently graded. Aboveground piping is readily visible in this photo, most likely due to them being painted white between 1977 and

1984. New aboveground piping appears to have been installed outside of the east concrete dike wall around Tanks 6008 and 6009. New aboveground piping also appears to have been installed on the west side of Tanks 6205 and 6206, extending in a southeasterly direction, parallel to the shoreline for several hundred feet, then heading northeast to the area of the saltwater building.

The fill area by the pier and west shoreline is heavily vegetated, and the pier itself is deteriorated.

1989

The 17 AGSTs identified in the 1989 aerial photograph are the same AGSTs which exist today. Also identified in the 1989 photo are three buildings which remain today as well. One storage area, including possible drums, can be seen in the northeastern corner of Yard 6.

Between 1984 and 1989, one building east of Tank 6204 was removed. During this time, a pier was built on the Kill van Kull at the southwestern corner of the site and additional tank piping was installed throughout Yard 6.

2.2.4.7 Yard 8: 1947 - 1989

1947

A review of the 1947 aerial photo indicates that Yard 8, which until recently was the leasehold location of the Rona Pearl tenant, was the location of some sort of operational area. A total of 48 AGSTs are visible in the yard. The eastern portion of the yard appears as a piping area, possibly a polymer plant as identified on the 1948 site plan. Also identified were seven buildings, five of which were located in the center of the yard, one along the western side of the yard, and one in the southeastern corner of the yard. One building in the center of the northern border of the yard remains today. Based on the 1948 Site Plan, the buildings identified from west to east include Sweaters at the west yard boundary; Centrifuge along the northern boundary; and buildings identified as an Annex, No. 4 Building, Chillers, No. 1 Building Annex, and Wash Room in the center of the yard.

1959

In the 1959 aerial photograph, Yard 8 is essentially vacant. The entire operational area including buildings, pipes, and tanks are no longer present. The only remaining structures in the yard include a medium-sized building at the approximate center of the yard's southern boundary, and a row of five AGSTs east of the Wash Room Building.

1963

The 1963 aerial photograph shows only one building present near the center, along the yard's south boundary. This new building appears to be attached to the east wall of the wash room building, extending in an easterly direction. Also identified were four AGSTs located at the northeast corner of the building. The above-noted building still exists today. Nine horizontal tanks appear to be located immediately northwest of the building; however, they may actually be cylindrical, vertical tanks awaiting installation. As it appears, the new building in the yard was under construction at the time the 1963 photo was taken.

Additional construction related material and equipment appears to be located immediately east of the building.

1970

Eight AGSTs were identified in the 1970 aerial photo. Six of the AGSTs are located in a row along the northern yard boundary, north of the building, and two along the northwest corner of the building. One building was identified along the southern yard boundary near the southeastern corner. This building still exists in Yard 8 today, and was the building that appeared to be under construction in the 1963 photo.

The four AGSTs identified in the 1963 photo are no longer present at the northeast corner of the building. The building area appears to have a fence erected around it. The remainder of Yard 8 is vacant. An aboveground pipeline appears in the center of the yard extending in a north-south direction from Yard 5 to the north, to the railroad trades south of Yard 8.

1977

In the 1977 air photo, the building located along the southern yard boundary is still present and appears to have been expanded north and west of the old wash room building. Sixteen AGSTs are visible. These AGSTs include 11 along the northern yard boundary and five along the north side of the building. One of these five tanks near the building is horizontally-oriented.

The remainder of the yard remains vacant. The aboveground pipeline in the center of the yard is still visible in the 1977 photo.

1984

In the 1984 aerial photo, the large building identified previously along the southern border of the

yard is still present. In addition a new medium sized building has been erected approximately 200 feet east of the existing building. Both of these buildings exist on site today. Also visible in the photo are 17 AGSTs. Fairly heavily vegetated areas are readily apparent east and north of the large building.

Also between 1977 and 1984, one AGST along the northern yard boundary was removed and two AGSTs, one on the north side of the larger building and one horizontally-oriented AGST near the southeast corner, were erected.

1989

Twenty AGSTs and two buildings were identified in the 1989 aerial photograph. Four of these AGSTs still exist in Yard 8 today; they are located along the north side of the larger site building. One horizontally-oriented AGST is located near the southeast corner of the same building. The two buildings are the same as those identified in 1984.

Between 1984 and 1989, six AGSTs were added along the northern yard boundary and three AGSTs were removed from the north side of the larger building.

2.2.4.8 Yard 9: 1947 - 1989

1947

For purposes of this RI, Yard 9 is the Platty Kill Canal and Platty Kill Pond. The Platty Canal is L-shaped with the Platty Kill Pond at its headwater. The 1948 site plan identifies the Platty Kill Pond as a Separator Pond. Sorbent booms on the Platty Kill Canal are visible in the 1947 aerial photograph from the pond to the bend in the canal. No dams are visible in the creek in this photo. The creek extends from the Platty Kill Canal Pond to the Kill van Kull as it does today. A barge is present along the Bayonne Industries side of the canal at a location approximately halfway between the Kill van Kull and the bend in the canal. The Platty Kill Canal forms the boundary between Bayonne Industries and Exxon. No discharges or pipes are readily apparent entering the pond or canal in the 1947 photograph.

1959

In the 1959 air photo, discharges to the canal are visible from both the Bayonne Industries and Exxon sides. On the Bayonne Industries (west) side, one discharge is on the west side of the pond and one on the west side of the canal, approximately 350 feet north of the mouth. Two discharges are also visible on the Exxon (east) side, one near the pond, and one at the canal

mouth near the Exxon pier on the Kill van Kull. What appears to be several sorbent booms are located in the Platty Kill Canal and Pond. In the 1959 photo, no dams are present in the canal. Floating product appears to be on the surface of the pond and on the surface of the upper canal. Since there are no manufacturers on the Bayonne Industries' side, it is speculated these were stormwater discharges. Some of the Exxon discharges may be steam condensate. A barge appears to be entering or is docked at the mouth of the canal.

1963

Discharges to the canal are still visible on the Exxon side (east side) of the creek. This discharge near the pond was also identified in the 1959 photo. A second discharge from the Exxon side of the canal appears to be coming from a point 300 feet from the mouth of the canal. A white area at the southern end of the canal on the Bayonne Industries side, appears to be steam or condensate. What appears to be sorbent booms appear at several locations along the canal, and floating product appears to be present on the surface of the pond. An aboveground pipeline appears to have been constructed along the west bank of the canal and pond extending up into Yard 3. A barge appears to be docked on the Bayonne Industries side of the canal at the mouth.

1970

Several sorbent booms are visible in the 1970 photo. Debris appears to be present behind the boom placed approximately 350 feet north of the canal mouth. What appears to be a dam or baffle has been installed south of the bend in the canal. Between the dam and the pond what appears to be a large discharge from the Exxon side is evident. This discharge location was also identified in the 1959 and 1963 photos.

1977

In the 1977 photo, a sorbent boom is visible in the pond with floating product on the water present behind it. One discharge into the pond from the Bayonne Industries side is apparent. The building of the earth dam, separating the pond from the canal, appears to have begun in this photo. Floating product appears to be backed up behind the baffle or dam located just south of the bend on the canal. No discharges from either the Bayonne Industries or Exxon sides of the canal and pond are visible on the 1977 photo.

1984

In the 1984 photo, the earth dam appears to have been completed and no discharges or sorbent

booms are visible in this photo. A pipeline has been installed over the dam or baffle which is located south of the bend in the creek. This pipeline appears to extend from the Bayonne Industries property to the Exxon property. The existing aboveground pipeline that runs along the west bank of the canal now goes over the newly constructed earth dam separating the pond and canal, and extends into Yard 3.

1989

One sorbent boom is visible in the 1989 aerial photo. This boom is located at the southern end of the creek. No discharges are visible in the 1989 photo. A dock is visible on the Bayonne Industries (west) side near the southern end of the creek.

2.2.4.9 Yard 10: 1947 - 1989

1947

For purposes of this RI, Yard 10 is the present location of the Co-Gen facility tenant. In the 1947 photo, the Yard 10 area includes some sort of operational area on the center and east portion of the yard, and two buildings and a storage area on the west portion of the yard. On the 1948 site plan the operational area in the center portion of the yard is identified as a gas plant. The identification of the operational area on the east portion of the yard is not readable on the site plan. Two buildings are present north of the east side operational area, these are identified as Wash and Locker rooms on the 1948 site plan. The larger of the two buildings on the west portion of the yard is identified as a Plate Shop, and the smaller building as the Carpenter Shop. The storage are to the north of these two buildings is identified as a Lumber Storage Area.

A total of seventeen AGSTs are visible in this yard in the 1947 photo. The Gas Plant Operational area also includes what is identified as a Butane-Propane Plant. Five horizontal tanks associated with the gas plant are located west of the plant. Three small buildings, identified as Riggers Wash Room and Riggers Stores are located immediately west of these horizontal tanks. Two large round tanks identified as Gas Holder and Gas Holder 2 are located north of the horizontal tanks. A group of nine AGSTs separate the Gas Plant area from the operational area on the east portion of the yard. The east side operational area borders Yard 3.

A small building with a smoke stack is visible at the southwest corner of the yard, south of the carpenter shop. The 1948 Site Plan identifies this building as an incinerator.

1959

Changes occurred in Yard 10 between 1947 and 1959. In the 1959 photograph, both the Gas Plant operational area in the center of the yard, and the operational area on the east side of the yard are no longer present. The two Wash and Locker Room Buildings, located north of the operational area on the east side, are still present in the 1959 photo, as is the group of nine AGSTs separating the two operational areas. Two buildings remain from the Gas Plant, including a compressor Building, west of the nine tanks, and a Pump House, south of the Compressor building. The five horizontal tanks and two gas holders are no longer present. The two former operational areas are vacant in the 1959 photo.

The Riggers buildings, the Plate Shop building and the Carpenter Shop building are all still present in the west portion of the Yard. The Carpenter Shop building has been expanded in a southerly direction. There has been a significant reduction in the volume of lumber stored in the lumber yard. The incinerator, located on the southwest corner of the yard, is no longer present in the 1959 photo.

1963

In the 1963 aerial photograph, the two former operational areas remain vacant. The group of nine tanks separating the two areas are no longer present. Remnants of an aboveground pipeline on either side of this former tank group are readily apparent in the photo. The former Gas Plant Compressor building and Pump House building are no longer present in the 1963 photo.

The two wash and locker room buildings in the northeast corner of the yard, and the Carpenter Shop building and Plate Shop building on the west side of the yard are still present in the 1963 photo. The lumber yard area north of the carpenter shop appears to be inactive.

1970

Very few changes occurred between 1963 and 1970. In the 1970 aerial photo, the buildings which were identified in the 1963 photo are still present. Two of these buildings still exist today. Several storage-type containers are present in the former operational area on the east portion of the yard. The central portion of the yard appears to be fairly well vegetated.

1977

Very few changes occurred between 1970 and 1977. The central and east portions of the yard remain vacant. The containers present in the east portion of the yard in the 1963 photo are no longer present in the 1977 photo. The two buildings in the northwest corner, and the carpenter

shop and plate shop buildings in the southwest portion of the yard are still present. The area north of the carpenter shop building appears to have some storage for piping and trucks.

1984

One notable change in Yard 10 appears to have occurred between 1977 and 1984. This would be the removal of the Plate Shop building, which is no longer present in the 1984 photograph. The Plate Shop building is believed to have been the location of the Southern California Chemical tenant. The Carpenter Shop building and the Wash and Locker room building in the northeast corner of the yard are still present. The remainder of the yard remains vacant, with remnants of aboveground piping and building foundations still present.

1989

Notable changes also occurred in Yard 10 between 1984 and 1989, the majority of which includes the construction of the co-generation plant that is on-site today. In the 1989 air photo, Yard 10 appears as it does today. Ten AGSTs and seven buildings are present, four of the existing buildings are located near the center of the yard, and buildings are located in the southwest, northeast, and southeast corners of the yard. The plant area located in Yard 10 appears to be paved.

Between 1984 and 1989, two buildings were removed, one from the northeast corner and one along the western yard boundary.

presence of buildings and tanks in this area. No additional information concerning the history of this surface impoundment was available at this time. Soil borings were installed and soil samples collected and analyzed to determine if this impoundment was present in the location indicated on the 1921 Site Plan. The results of this work is presented in Section 5.2.1 of this report.

3.3.2 Transformers

Three transformers, documented by oil sample results to be PCB-contaminated, were located on the eastern side of the Wemco Wastewater Treatment Unit in Yard 3. PCB concentrations were reported to be between 50 and 500 ppm. There are no known leaks or discharges associated with these transformers. These transformers were formally decommissioned, removed, and both transformer an duel disposed of in a properly documented fashion. A certificate of determination is maintained on file.

3.3.3 Storm Sewers

Several active storm sewers are located throughout Yard 3. Previous reports indicate that the storm sewers and process sewers were combined as one system. This system was completely redesigned as part of the rehabilitation of this yard, conducted in the winter of 1994 - 1995. Additional information gathering on the active and inactive storm sewer system will be conducted as a future phase of this investigation.

3.3.4 Underground Product Lines

All underground pipelines in Yard 3 are inactive. Several of these product lines are located along the southern, eastern, and western boundaries of Yard 3. Two of these pipe lines (No. 17 and No. 22) reportedly carried No. 4 and No. 6 fuel oils, respectively, and were last used in 1982 and 1974, respectively. Seven additional inactive product lines in Yard 3 reportedly carried No. 2 and No. 6 fuel oils and MTBE.

3.4 Yard 4

Yard 4 is located at the northwest corner of the site property and encompasses approximately 20 acres. This yard is bordered on the north by Route 169 and the Kenrich Petrochemical property, to the east by Yard 5, and to the south by a railroad right-of-way. Currently, no aboveground storage tanks are located in Yard 4; however, previous maps and air photos indicate that Series 4000 aboveground storage tanks were once located in this yard. Six of the former tank locations in the northwest corner are no longer part of the Bayonne Industries

property, and were formerly located in what is now the Route 169 right-of-way.

3.4.1 Former Surface Impoundment

One surface impoundment, identified as a separator in the 1921 Site Plan, is known to have been present in the northwest corner of Yard 4. The separator was present in all aerial photographs reviewed from 1947 through 1977. Based on the aerial photos, the separator was removed at some point between 1977 and 1984. The former location of the separator is no longer part of the Bayonne Industries property, as the northwest corner of Yard 4 was sold to the New Jersey Department of Transportation (NJDOT) for the construction of Route 169. As part of the scope of work for the Phase I RI, one monitoring well and soil boring was installed in the northwest corner of Yard 4 to evaluate the separator as a potential area of concern. The results of these activities are provided in Section 5.2.3.

3.4.2 Storm Sewers

One active and several inactive storm sewers are located throughout Yard 4. The storm sewers had reportedly been previously combined with the process sewer system. Some questions exists as to the structural integrity of these sewers, but flooding does not occur in this yard. No additional information concerning the history or current use of these sewers is currently available. Additional information gathering on the active and inactive storm sewer system will be conducted as a future phase of this RI.

3.4.3 Underground Product Lines

All underground pipelines in Yard 4 are inactive. Four of these product lines used for No. 2 fuel oil are located along the western boundary of Yard 4 and several others are located throughout Yard 4. The inactive lines were installed on various dates between the 1930s and 1958. Their use was discontinued at various times between 1958 and 1982. Only petroleum products were reportedly carried by these product lines.

3.4.4 Kenrich Petrochemical Property

Although not part of the Bayonne Industries property, the Kenrich property is an area of concern based on the large number of drums and containers occasionally observed on this property along the north border of Yard 4. There was at least one area of concern for this site dated November 1983, requiring clean-up of the drums and containers. Wastes on the site included halogenated and nonhalogenated solvents, cadmium, lead, arsenic, formaldehyde, naphthalene, and ignitable and corrosive liquids. Groundwater flow is from the Kenrich property to the

Bayonne Industries property. Therefore, to evaluate the impact that the Kenrich property was having on the Bayonne Industries property, two soil borings and monitoring wells were installed and sampled at the border of these two properties. Results from these activities are presented in Section 5.12 and 6.3 of this report.

3.5 Yard 5

Yard 5 encompasses approximately 32 acres of land located in the northeast corner of the site property. This yard is bordered on the north by Hook Road and the Bayonne Durable property, on the south by Yards 3 and 8, and on the west by Yard 4. Yard 5 currently contains the Series 5000 aboveground storage tanks which have reportedly contained only petroleum products since 1983. Table 3-5 presents a summary of Bayonne Industries' historical product storage in these tanks from 1983 to present.

3.5.1 Free Product

Both monitoring wells, MW-1 and MW-11, located in Yard 5, have had detectable levels of product during ENSR's monitoring events in February, March, and April 1993. Apparent product thicknesses in MW-1 during these events have ranged from 0.89 foot (February 1993) to 1.45 feet (March 1993). Product detected in MW-11 has ranged in thickness from 0.19 (March 1993) to 0.46 foot (April 1993). Additional product measured data for these wells are presented in Section 6.2 of this report.

3.5.2 Spills

Four spills, greater than 100 gallons, have reportedly occurred in Yard 5. One other spill appears to be present in the 1970 aerial photograph. On August 22, 1989, approximately 150 gallons of gasoline were released from a tank bottom leak on Tank 5161, located near the western boundary of the yard. To evaluate potential contamination associated with this spill, soil borings were installed and sampled during Phase I RI, the results of which are presented in Section 5.8 of this report.

A second spill in Yard 5 occurred on August 8, 1990. Approximately 200 gallons of gasoline were spilled when a pump broke on Tank 5070. Tank 5070 is located in the center of Yard 5. To evaluate potential contamination associated with this spill, soil borings were installed and sampled during the Phase I RI, the results of which are presented in Section 5.6 of this report.

A third spill occurred in Yard 5 on July 3, 1993 at Tank 5073. Approximately 536 barrels of gasoline were discharged to the surface. To evaluate potential contamination associated with

TA 3-5

Yard 5 Historical Product Storage Summary - 1983 to Present
Bayonne Industries, Inc., Bayonne, New Jersey

Tank No.	Current Product Service	History From 1983 To Present
5057	Gasoline	#6 fuel oil thru 3/87. From 11/22/87 to 9/11/91 gasoline. From 9/12/91 to 3/20/92 #2 fuel oil. From 5/8/92 to 9/10/92 gasoline. From 9/11/92 #2 fuel oil. Presently gasoline.
5059	Gasoline	#6 fuel oil thru 3/87. From 11/22/87 to 9/11/91 gasoline. From 9/12/91 to 3/20/92 #2 fuel oil. From 5/8/92 to 9/10/92 gasoline. From 9/11/92 #2 fuel oil. Presently gasoline.
5064	Gasoline	#6 fuel oil thru 3/87. From 11/17/87 to present gasoline
5070	Gasoline	#6 fuel oil thru 3/87. From 6/6/87 to present gasoline
5073	Gasoline	#6 fuel oil thru 3/87. From 6/6/87 to present gasoline
5076	Gasoline	#6 fuel oil thru 3/87. From 11/21/87 to present gasoline
5077	Gasoline	#6 fuel oil thru 3/87. From 11/22/87 to present gasoline
5085	Gasoline	#6 fuel oil thru 3/87. From 6/6/87 to present gasoline
5156	Gasoline	#6 fuel oil thru 3/87. From 11/17/87 to 9/1/91 gasoline. From 9/12/91 to 3/31/92 #2 fuel oil. From 5/8/92 to 9/10/92 gasoline. From 9/11/92 #2 fuel oil. Presently gasoline.
5161	Gasoline	Gasoline
5162	Gasoline	Gasoline
5163	Gasoline	Gasoline
5164	Gasoline	Gasoline
5184	Gasoline	Gasoline
5186	Gasoline	Gasoline thru 7/31/91. From 8/5/91 to 3/7/92 #2 fuel oil. From 3/12/92 to present gasoline
5187	Gasoline	Gasoline
5188	Gasoline	Gasoline
5209	Gasoline	#6 fuel oil thru 3/31/87. From 11/21/87 to present gasoline
5210	Gasoline	#6 fuel oil thru 3/31/87. From 11/22/87 to present gasoline
5211	Gasoline	#6 fuel oil thru 4/14/87. From 11/22/87 to present gasoline (6/21/89 to present = gas recovery)
5212	Gasoline	#6 fuel oil thru 3/31/87. From 11/22/87 to present gasoline
5213	Gasoline	#6 fuel oil thru 3/31/87. From 11/22/87 to present gasoline

TABLE (cont'd)

Tank No.	Current Product Service	History From 1983 To Present
5214	Gasoline	#6 fuel oil thru 3/31/87. From 11/22/87 to present gasoline
5604	#2 Fuel Oil	#2 Fuel Oil
5605	#2 Fuel Oil	#2 Fuel Oil
5606	#2 Fuel Oil	#2 Fuel Oil
5801	Gasoline	#6 fuel oil thru 4/14/87. From 11/17/87 to 8/5/91 gasoline. From 8/6/91 to 8/18/91 #2 fuel oil. From 2/24/92 to present gasoline
5802	Gasoline	#6 fuel oil thru 4/14/87. From 11/22/87 to 8/5/91 gasoline. From 8/6/91 to 2/19/92 #2 fuel oil. From 2/28/92 to present gasoline
5803	Gasoline	Gasoline thru 8/1/91. From 8/2/91 to 3/7/92 #2 fuel oil. From 3/16/92 to 8/20/92 gasoline. From 8/21/92 #2 fuel oil. Presently gasoline.
5804	Gasoline	#6 fuel oil 12/31/84 to 2/28/86. From 9/3/86 to 3/31/87 #2 fuel oil. From 6/18/87 to 7/29/91 gasoline. From 7/30/91 to 3/7/92 #2 fuel oil. From 3/16/92 to present gasoline
5805	Gasoline	Gasoline thru 8/20/92. From 8/21/92 #2 fuel oil, presently gasoline.
5806	#2 Fuel Oil	Gasoline thru 8/17/91. From 8/18/91 to 3/13/92 #2 fuel oil. From 3/21/92 to 9/13/92 gasoline. From 9/14/92 to present #2 fuel oil.
5808	Gasoline	Gasoline thru 7/29/91. From 7/30/91 to 3/7/92 #2 fuel oil. From 4/6/92 to 8/12/92 gasoline. From 8/21/92 #2 fuel oil, presently gasoline.
5809	Gasoline	#6 fuel oil thru 4/30/86. From 8/6/86 to 6/17/87 #2 fuel oil. From 6/18/87 to 8/6/91 gasoline. From 8/7/91 to 3/7/92 #2 fuel oil. From 3/16/92 to 8/15/92 gasoline. From 8/21/92 #2 fuel oil. Presently gasoline.
5810	Gasoline	#2 fuel oil thru 1/30/86. From 3/1/86 to 7/29/91 gasoline. From 7/30/91 to 2/28/92 #2 fuel oil. From 3/15/92 to 8/15/92 gasoline. From 8/21/92 #2 fuel oil. Presently gasoline.
5811	Gasoline	#2 fuel oil thru 1/30/86. From 2/1/86 to 7/14/91 gasoline. From 7/15/91 to 3/7/92 #2 fuel oil. From 3/15/92 to 8/20/92 gasoline. From 8/21/92 #2 fuel oil. Presently gasoline.
5812	Gasoline	Gasoline thru 7/14/91. From 7/15/91 - 3/7/92 #2 fuel oil. From 3/15/92 to 8/24/92 gasoline. From 8/25/92 #2 fuel oil. Presently gasoline.

this spill soil borings were installed and sampled in this area during the Phase I RI, the results of which are provided in Section 5.7 of this report.

A fourth documented spill in Yard 5 occurred on August 8, 1988 from Tank 5214. It was estimated that approximately 2,000 gallons of gasoline were spilled into the dike area surrounding the tank. IMTT personnel cleaned-up the spill, the majority of which was floating on the surface of stormwater that was present within the dike. No known soil sampling was conducted in the area of the spill.

A fifth potential spill was noted in the dike area surrounding Tank 5077 on the 1970 aerial photograph. This dike area is rather substantial in size, measuring approximately 150 feet by 300 feet. No documentation was found concerning this "ponded water or oil" observed on the 1970 aerial photograph.

3.5.3 Surface Impoundments

One existing surface impoundment has been identified in Yard 5. This surface impoundment is located in the northwest corner of Yard 5. This surface impoundment is a stormwater drainage basin which currently drains stormwater from the Yard 5 dike areas, prior to being pumped to the on-site water treatment facility. This surface impoundment dates back to at least the 1920s. Reportedly in 1981-82 an unsuccessful attempt was made to fill in this drainage basin with fly ash. No other historical information concerning this drainage basin was discovered during the file review process.

3.5.4 Transformers

Three transformers, documented by oil sample results to be PCB transformers, were located in the southeast corner of Yard 5. PCB concentrations in these transformers were reported to be 500 ppm or greater. There are no known leaks or discharges associated with these transformers. The transformer has been formally decommissioned, removed, and both transformer an duel disposed of in a properly documented fashion. A certificate of determination is maintained on file.

3.5.5 Chromium Contamination

One area of chromium contamination, located along the western boundary, has been identified in Yard 5. This area is identified as site 139-6 by the NJDEP in the Hudson County Chromate Sites Survey. This chromium area encompasses the berm along the eastside of the main entrance road to the facility and the stormwater basin. The areas of chromium contamination

are currently under investigation by the NJDEP.

3.5.6 Storm Sewers

Several active storm sewers are located throughout Yard 5. It has been reported that these storm sewers had been combined with the facility process sewer system, and some question may exist as to the structural integrity. At this time, no additional information concerning the history and current status of these sewers was collected. Additional information gathering concerning the storm sewer system will be collected during a future phase of this RI. No flooding occurs in this elevated area.

3.5.7 Underground Product Lines

All underground product lines in yard 5 are inactive. Three of these lines (Nos. 19, 20, 21) are located along the eastern boundary of Yard 5. Installation of these lines was between the 1930s and 1968. They were last used between 1978 and 1984, for the transport of No. 6 fuel oil. No additional information concerning the history of these product lines is available at this time.

3.5.8 Septic Tanks

One septic tank, located on the northwest side of Tank 5156, has been identified in Yard 5. This septic tank has been identified on the Yard 5 Map as Y5-ST-A. This septic tank was present on the 1921 and 1948 Site Plans and was shown to be associated with the Crude Oil Pump House also located on the northwest side of Tank 5156. The laterals for the septic tank are located between Tanks 5156 and 5061. No additional information concerning the use or history of this septic tank is available at this time.

3.6 Yard 6

Yard 6 encompasses approximately 35 acres (not including the portion of the Kill van Kull), along the western site boundary. Yard 6 is bordered to the north by the railroad right-of-way, to the east by Yard 10 and Yard 1, and to the south and west by the Kill van Kull. Yard 6 consists of Series 6000 aboveground storage tanks which have reportedly contained only petroleum products and acetone since 1983. Table 3-6 presents a summary of Bayonne Industries' historical product storage in these tanks from 1983 to present. Table 3-2 provides a reference table of acronyms and their chemical names.

TABLE 3-6
Yard 6 Historical Product Storage Summary - 1983 to Present
Bayonne Industries, Inc., Bayonne, New Jersey

Tank No.	Current Product Service	History From 1983 to Present
6002	Gasoline	#6 thru 5/1/85. From 6/14/85 thru 9/4/88 gas. From 9/5/88 thru 1/22/89 #2 fuel oil. From 1/23/89 to present gasoline
6003	#6 Fuel Oil	#6 fuel oil thru present
6004	#6 Fuel Oil	#6 fuel oil thru present
6005	#6 Fuel Oil	#6 fuel oil thru present
6006	Gasoline	#6 fuel oil thru 1/85. From 10/1/85 thru 6/1/91 gasoline. From 6/15/91 MTBE. Presently gasoline
6007	Gasoline	BS&W thru 5/7/85. From 5/8/85 thru 9/4/88 gasoline. From 9/5/88 thru 1/22/89 #2 fuel oil. From 1/23/89 to present gasoline
6008	Gasoline	#6 fuel oil thru 4/28/85. From 6/15/85 to present gasoline
6009	Gasoline	#6 fuel oil thru 4/29/85. From 6/15/85 thru 8/20/92 gasoline. From 9/26/92 ethyl alcohol. Presently gasoline
6010	Gasoline	BS&W thru 5/7/85. From 5/8/85 thru 9/4/88 gasoline. From 9/5/88 thru 1/22/89 #2 fuel oil. From 1/23/89 to present gasoline
6011	Gasoline	Gasoline thru 3/1/93. From 3/8/91 to present MTBE. Presently gasoline
6012	#6 Fuel Oil	#6 fuel oil thru present
6105	Gasoline	Acetone thru 9/7/84. From 5/85 to present gasoline
6106	Gasoline	Acetone thru 9/7/84. From 5/85 to present gasoline
6203	#6 Fuel Oil	#6 fuel oil thru present
6204	#6 Fuel Oil	#6 fuel oil thru present
6205	#6 Fuel Oil	#6 fuel oil thru present
6206	#6 Fuel Oil	#6 fuel oil thru present

3.6.1 Free Product

Since ENSR began monthly groundwater monitoring in February 1993, only two (MW-7 and MW-17) of the eight wells in Yard 6 have had detectable levels of free-phase product. Product thicknesses in monitoring well MW-7 ranged from 0.01 foot in March 1993 to 0.19 foot in April 1993. In monitoring well MW-17, product thicknesses ranged from 0.02 foot (April 1993) to 0.07 foot (February 1993). Additional monitoring wells were installed in Yard 6 during the Phase I RI activities and additional product measurements and identification was also conducted. These results are provided in Section 6.0.

3.6.2 Spills

Three spills, over 100 gallons, have been reported in Yard 6 since January 1987; two of these are associated with the Tank 6203/6204 diked area. On December 15, 1989, approximately 150 gallons of gasoline were released when a pipeline on Tank 6204 was found leaking. On February 24, 1993, approximately 10,000 gallons of No. 6 fuel oil were released from Tank 6203. The cause of the release was due to tank failure. A cleanup was conducted in the diked area around the tank. To evaluate potential contamination associated with this spill, soil borings were installed and soil samples were collected from the area around Tank 6203/6204; the results of which are presented in Section 5.10.

On August 8, 1986, approximately 900 barrels of gasoline were released from an open drain valve on Tank 6006, into the tank dike area and a storm gate to the on-site drainage system. It was concluded that a major portion of the gasoline released was trapped in the storm drain system because the flow to the Wemco Separator pond was coincidently shut off to make repairs and reportedly flushed the storm drains to the treatment plant. To evaluate potential contamination associated with this spill at Tank 6006, soil borings were installed and sampled in the diked area surrounding this tank, the results of which are reported in Section 5.___ of this report.

A review of the aerial photographs indicate the potential presence of one additional spill in the diked area surrounding Tanks 6002, 6007, 6008, 6009, and 6010. It appears as if this "ponded oil or water" is surrounding tank 6002. No documentation concerning this potential spill was found during the file review process.

3.6.3 Underground Storage Tanks (USTs)

Three 1,000-gallon, steel, gasoline USTs (T1, T2, T3) were excavated and removed from the southwest corner of Yard 6 on March 17 and 18, 1992, in accordance with a NJDEP approved

closure plan. Upon removal, holes were reported on the sides and bottom of all the USTS. No post-excavation soil samples were collected to evaluate subsurface conditions since they would be collected as part of the RI. Three test pits were dug to evaluate subsurface conditions in the area of the former USTs during the Phase I RI and soil samples collected and analyzed. The results of which are provided in Section 5.1.2.

3.6.4 Transformers

Three transformers, have been identified in Yard 6. Two of the three transformers are located southwest of Tank 6009 and have been documented by oil sample results to be PCB-contaminated. These two transformers have PCB concentrations between 50 and 500 ppm. The third transformer is also located in the southwest corner of Yard 6 and has been identified as PCB transformer. There are no known leaks or discharges associated with these transformers which will remain in service for the next several years.

3.6.5 Chromium Contamination

In Yard 6, four areas of chromium contamination have been identified. These areas have been identified as Sites 139-2, 139-4, 139-5, and 139-5a by the NJDEP in the Hudson County Chromate Site Survey. Site 139-2 is located at the Waterfront in Yard 6 at the head of Pier A and south of the Saltwater Pump House. Site 139-4 is a portion of the east dike berm of Tank 6204 and the west dike berm of tanks 6203 and 6204. Site 139-5 encompasses the area surrounding the two ball tanks in the northwest corner of the site west of Tank 6012. Site 139-5A is an area south of Tank 6011. These areas of chromium contamination are currently under investigation by the NJDEP.

3.6.6 Storm Sewers

Several active and inactive storm sewers, primarily located in the northern third of Yard 6, have been identified. Previous reports indicate the storm sewer system had once been combined with the process sewer system, and some question may exist on its structural integrity. No additional information concerning the history or current status of these systems is available at this time. Additional information gathering on the storm sewer system will be conducted as a future phase of this RI.

3.6.7 Potential Former Surface Impoundments

A number of possible former surface impoundments were noted on the aerial photographs in the northeast portion of Yard 6. One of these impoundments were noted in the 1959 aerial photograph east of tanks 6008 and 6009. This area was noted on all aerial photographs from 1959 through 1977.

A drainage area was first noted in the 1959 aerial photograph going from the dike area surrounding Tanks 6002, 6007, 6008, 6009 and 6010, into the vacant area north of the Tank Yard. This drainage area was much larger and more apparent in the 1963 aerial photograph, and absent in the 1970 and subsequent photos.

A large area of "ponded water" was first noted on the extreme northeast corner of Yard 6 in the 1970 aerial photograph. Remnants of the pond was apparent on the 1977 photograph and reappearance of a small pond in the same area on the 1984 photograph was also noted.

Three new rectangular areas were also first noted in the 1970 aerial photograph along the east border of Yards 6 and 10. These three areas were also present on the 1977 photograph, but no longer present in the 1984 and subsequent photographs.

3.6.8 Underground Product Lines

Seven active product lines have been identified in Yard 6. Six of these lines are used to transport No. 6 fuel oil primarily, and one is used to transport MTBE.

3.7 Yard 8

Yard 8 is approximately three acres in size and has until recently been leased to Rona Pearl. This yard is bordered to the north by Yard 1, to the west by Yard 4, and to the south by Yard 3. Rona Pearl has vacated the premises and their site has cleared the ISRA process.

3.8 Yard 9

Yard 9 includes the Platty Kill Pond and the Platty Kill Canal located along the southeast boundary of the property. This yard is bordered to the east by the former Exxon Lubricant Plant property, to the south by the Kill van Kull, to the west by Yard 2, and to the north and west by Yard 3. The size of the Platty Kill Pond is approximately 140 feet wide by 250 feet long by 15 feet deep. It is enclosed by wooden bulkheads on three sides and an earthen dike on the fourth side. The pond is known to contain water and petroleum sludge. Approximately 8 to 10 feet of

LEGEND

- CLEANED & VIDEO INSPECTION OR NEW INSTALLATION
- PROPOSED TO BE CLEANED & VIDEO INSPECTION
- ABOVE GROUND LINES
- ABANDONED/REMOVED SEWER
- UNKNOWN PIPE
- OLD SEWER, SOURCE UNKNOWN
- ● TO BE SURVEYED
- ● SURVEYED STRUCTURE
- * PRE-CLEANING SAMPLE TAKEN

ACAD Drawing Name: F-1663

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REV.	DATE	DESCRIPTION	BY	CHK.

REVISIONS

IMTT BAYONNE
BAYONNE NEW JERSEY

TITLE: WESTSIDE SEWER LAYOUT (NORTH SECTION)

PROJ. No.	DATE	SCALE
BA-0427	11/11/04	1"=100'-0"
DRAWN BY D.S.H.	CHECKED BY B.T.	APPROVED BY G.B.
DRAWING NUMBER F-1663		REV. 0

LEGEND

- CLEANED & VIDEO INSPECTED OR NEW INSTALLATION
- PROPOSED TO BE CLEANED & VIDEO INSPECTED
- ABOVE GROUND LINES
- ABANDONED/REMOVED SEWER
- UNKNOWN PIPE
- OLD SEWER, SOURCE UNKNOWN
- OLD BAYONNE D.O.T.
- ● TO BE SURVEYED
- ● SURVEYED STRUCTURE
- * PRE-CLEANING SAMPLE TAKEN

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REV.	DATE	DESCRIPTION	BY	CHK.
2	9/30/05	GENERAL UPDATE QR 5	D.S.H	B.T.T.
1	6/30/05	GENERAL UPDATE QR 4	D.S.H	B.T.T.

REVISIONS

ACAD Drawing Name:F-1662 R2

IMTT BAYONNE
BAYONNE NEW JERSEY

TITLE: WESTSIDE SEWER LAYOUT (SOUTH SECTION)

PROJ. No.	DATE	SCALE
BA-0427	11/18/04	1"=100'-0"
DRAWN BY: D.S.H.	CHECKED BY: B.T.	APPROVED BY: G.B.
DRAWING NUMBER: F-1662		REV. 2

BAYONNE INDUSTRIES, INC.

250 EAST 22ND ST. P.O. BOX 67 BAYONNE, NEW JERSEY 07002

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MAIN OFFICE FAX: (201) 339-4637
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October 14, 2005

Mr. Mark Walters, Case Manager
NJDEP Bureau of Case Management
P.O. Box 028
401 East State Street
Trenton, NJ 08625-0028

RE: In the Matter of the Bayonne Industries (BII) Site
City of Bayonne, Hudson County, New Jersey
Program ID No. 002552
Memorandum of Agreement (MOA) dated 27 May, 1992
Remediation Agreement (RA) dated 22 January, 1999 – ISRA Case #98513
NJDEP Bureau of Case Management Letter of January 08, 2004
Sewer Remediation Investigation Work Plan (RIWP) dated 16 April, 2004
Quarterly Report No. 5 dated October 14, 2005, with analytical Deliverables

Dear Mr. Walters:

Bayonne Industries, Incorporated (BII) is submitting two copies of the fourth Quarterly Report covering the sewer investigation work performed between June 13, 2005 and September 18, 2005.

Plot Plan Drawings located in Appendix H contain sensitive security information and may not be used, reproduced, copied or transmitted in any form without written permission. If it is necessary to obtain such permission, or you require additional information, please contact the writer at (201) 427-2200.

Sincerely,
Bayonne Industries, Incorporated

George M. Bress, P.E.
Manager Environmental Projects

Enclosures

cc: R. R. Fisette, IMTT-Bayonne
Dennis Barbarise, Sr., IMTT-Bayonne
Rusty Walker, IMTT
Jim Osman, IMTT-Bayonne (without enclosures)
Tom Lambert, IMTT-Bayonne (without enclosures)
Jamie Coleman, IMTT (without enclosures)
Dale Gibson, IMTT (without enclosures)
Bernie Thompson, RPMS

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- **Plot Plan No. F-1796, 8/05/2005**
  West Side Containment Layout
- **Schedule**
  BII Sewer Cleaning & Video Inspection Schedule,

CERTIFICATION

Any person making a submission to the Department required by N.J.A.C. 7:26E shall include the following signature and notarized certification pursuant to 7:26C-1.2(a) 1, for each technical submittal. Additionally, the certification shall indicate the case name and address, case number, and type of documents submitted for each technical submittal.

TYPE OF DOCUMENT Remedial Investigation Work Plan Quarterly Report No. 5

CASE NAME Bayonne Industries, Inc. (BII) Sewer Investigation

CASE ADDRESS 250 East 22nd Street, Bayonne, New Jersey 07002

MEMORANDUM OF AGREEMENT (MOA) Dated 27 May, 1992

REMEDIATION AGREEMENT (RA) Dated 22 January, 1999

ISRA CASE No.: 98513

REMEDIAL INVESTIGATION WORK PLAN (RIWP) Dated 16 April, 2004

"I certify under penalty of law that I have personally examined and am familiar with the information submitted herein including all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statue, I am personally liable for penalties."

PRINTED NAME Richard R. Fisette TITLE Terminal Manager

SIGNATURE [signature] DATE 10-13-05

NOTARY SIGNATURE [signature] DATE 10/13/05

NOTARY SEAL KRISTEN V. FLORKIEWICZ
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Jan. 14, 2010

1.0 RESPONSE TO NJDEP LETTER OF 7-06-2005

1.1 INVESTIGATION OF ABANDONED SEWER LINES

NJDEP Comment:

In Section 1.4 of the Sewer RIWP, IMTT states that, given the age of the facility and the amount of abandoned underground piping, it is impractical to locate, inspect and decommission all previously abandoned sewer lines. Therefore, IMTT proposes to inspect only active sewer lines. The Department agrees that inspection and replacement/repair of defective active sewer lines should be a priority. However, inactive piping can be a preferential migration route for contamination. Therefore, if any abandoned sewer lines that were not investigated are found to be conduits for contamination migration during subsequent remedial investigations at the site, IMTT will need to investigate the lines and implement corrective action.

IMTT Response:

IMTT agrees that that inactive below grade piping can be a preferential mitigation route for contaminants, depending on its characteristics, i.e., solubility, viscosity, etc. If abandoned sewers not investigated under the subject program are found to be conduits for contaminant migration subsequent remedial investigation at the site will be conducted.

1.2 SEALING OF ABANDONED SEWERS

NJDEP Comment:

In Section 2.1 of the Sewer RIWP, IMTT proposed to identify all cross-connections between active and abandoned sewers and inspect the connection for defective or missing seals. If seals are found to be defective or missing they will be repaired/installed. The Department recommends that active and inactive lines be completely severed from each other rather than sealed since seals could fall into disrepair in the future and re-establish the connection.

IMTT Response:

All sewer lines have been sealed by breaking the lines external to a sewer structure such as a manhole. The end of the sewer line is then capped and the hole in the sewer structure is then sealed, producing a double seal with a space between as show in Photo No. 1 in Appendix A, *Photos*.

1.3 OPEN SWALES

NJDEP Comment:

In Section 2.1 of the Sewer RIWP, IMTT states that the wood and tile sewer lines that are shown on Drawing No. 3 will be abandoned in place and replaced with open swales or new sewer lines. Please be advised that the use of open swales for conveying recovered contaminated ground water or contaminated storm water runoff may be subject to NJPDES permitting requirements.

IMTT Response:

IMTT wishes to clarify the use of the word "open swales" at this time. What IMTT meant by "open swales" were open top impervious concrete or metal troughs, not grass covered graded ground. We realize that the use of open ground to convey recovered contaminated ground water or storm water would require a NJPDES Discharge to Ground Water (DGW) Permit.

IMTT would also like to make the following comments on Drawing No. 3 as it appeared in the April 16, 2004 Sewer RIWP. IMTT Drawing No. F-1796, *West Side Containment Layout*, has been included in this Quarterly Report for reference purposes in locating the various yards or dike areas.

(a) The sewer line high-lighted in "green" (Sewer Main No. 1, Trunk Line No. 3) was in an abandoned area of the terminal that no longer had any storage tanks and according to historic drawings was of wood construction. A need to have an active sewer in this area for drainage from a proposed soil storage area prompted the cleaning and video inspection of this sewer. The sewer was found to be constructed of Cast Iron construction and in good shape. The inspection, activation of portions of this sewer and sealing of those portions not needed was covered in detail in Sections 2.1, 3.1.1 and 3.2.1 of Quarterly Report (QR) No 4, dated June 30, 2005.

(b) The sewer line high-lighted in "red" at the end of Sewer Main No. 1, Yard 1-B (see enclosed drawing F-1796), was cleaned and video inspected. Based on the condition of the wood sewers, portions were removed and other portions were abandoned in place. Since the sewer lines had been cleaned prior to abandonment, no "highly contaminated" sediments were left in place. A new Cast Iron sewer was installed in Yard 1-B as discussed in detail in Section 3.1 of QR No.1 dated June 11, 2004 and Section 3.2 of QR No. 2 dated December 23, 2004.

(c) The wood sewer line (Sewer Main No. 1, Trunk Line No. 1) high-lighted in "red" in Yard 1A (see drawing F-1796), was cleaned and inspected this quarter as discussed in this Quarterly Report. In addition the sewer line in Yard 1-C was found to be of wood construction as discussed in Sections 2.2, 3.1.2 and 3.2.2 of QR No. 4 dated June 30, 2005. Present plans call for these two wood sewer lines to be lined with plastic as described in the "Scope of Work" found in Appendix F.

1.4 SAMPLING LOADING RACK CATCH BASINS

NJDEP Comment:

In Section 5.1 of the Sewer RIWP, IMTT reported on page 5-3 that two storm sewer catch basins associated with the loading racks for diisobutylene and caustic were not connected to the sewer system and were instead functioning as dry wells. BI stated that soil samples would be collected from the dry wells during Phase I of the sewer investigation. Results of the sampling were reported in the March 2005 *Sewer System Investigation Quarterly Report No. 3*. However, not enough detail was provided on sample collection methods and locations. IMTT must provide more details on the sampling and analysis conducted for this area of concern in the next Sewer System Investigation Quarterly Report.

IMTT Response:

The dry wells were sampled in accordance with the sampling procedures presented in the Sewer RIWP dated April 16, 2004, and conditionally approved by the Department on November 09, 2004. Samples were obtained from the top layer of dirt in the dry wells using individual pre-cleaned sampling spoons. The samples were analyzed for PP+40 and TPHC. The results of the analysis were reported in QR No. 3 dated March 31, 2005, including a paper copy of the laboratory deliverables and an EDD diskette with the NJ co-ordinates of the dry wells. As part of the new Burma Road sewer installation, the truck loading rack concrete containment pads were resurfaced and graded to new catch basins. The old dry wells were covered over with concrete at that time. This area has been added to the list of areas being investigated for remediation and will be handled under the site remediation program.

2.0 PURPOSE and OBJECTIVES: 13 JUNE, 2005 through 18 SEPTEMBER, 2005

2.1 Clean, video investigate and repair as necessary the remaining parts of Sewer Main No. 3 within the Yard No. 6 dike area.

2.2 Finish video inspection and repairs of Trunk Line No. 1 off Sewer Main No. 1.

2.3 Clean and video investigate the lateral(s) to the Tank No. 1701 Dike area, off both the No. 1 & No. 3 Sewer Mains, with the intent of reactivating the gravity sewer lines and decommissioning the dike lift station.

2.4 Clean, video inspect and repair as necessary any other remaining laterals off Sewer Main No. 1, as time permits.

2.5 Prepare engineering specifications in order to obtain bids for the lining of the wood sewers in Sewer Main No. 1, Trunk Lines No. 1 & No. 2.

2.6 Survey over 50 new or excavated sewer structures.

2.7 Continue updating the Westside Sewer Layout drawings F-1662, South Section, and F-1663, North Section.

3.0 NARRATIVE

Paper copies of the video inspection reports completed this quarter can be found attached in Appendix G, *EQIS – Underground Inspection Division Report.* Also included are DVD copies of the camera Investigation.

TABLE 3-0

LINEAR FEET VIDEO INSPECTED WEEKLY

WEEK OF	LINEAR FEET										Weekly TOTAL
	WOOD							STEEL			
	36" Ø	24" Ø	16" Ø	14" Ø	12" Ø	10" Ø	BOX	24" Ø	12" Ø	8" Ø	
6/13 – 6/19			141.4	129.0	144.9	219.4				20.5	655.2
6/20 - 6/26				33.6	128.0	129.3					290.9
6/27 - 7/03					28.1	51.5			77.9		157.5
7/04 - 7/10	CLEANING TANK 1701 AREA IN PREPARATION FOR VIDEO INSPECTION										0.0
7/11 - 7/17											0.0
7/18 - 7/24	WORK IN YARD No. 8 EAST SIDE										0.0
7/25 - 7/31	VACUUM/JET RODDER TRUCK REPAIRS										0.0
8/01 - 8/07						19.1			8.8		27.9
8/08 - 8/14	CLEANING SEWER MAIN No. 2 IN PREPARATION FOR VIDEO INSPECTION										0.0
8/15 - 8/21	VACUUM/JET RODDER TRUCK REPAIRS										0.0
8/22 - 8/28	55.0	23.7									78.7
8/29 - 9/04								50.0			50.0
9/05 - 9/11	65.0										65.0
9/12 - 9/18							109.0		88.2		197.2
TOTALS	**120.0**	**23.7**	**141.4**	**162.6**	**301.0**	**419.3**	**109.0**	**50.0**	**174.9**	**20.5**	**1,522.4**
										AVERAGE	**108.7**
										ADJUSTED AVERAGE	**152.2**

3.1 CONTINUED INSPECTION
OF SEWER MAIN No. 3 WITHIN YARD No. 6

Inspection of the area revealed tight clearance around the storage tanks and a maze of at grade piping within the dike area. As a result, the vacuum/jet rodder truck used could not gain access to the catch basins within the dike area. Working in Yard 6 is further complicated by the fact that the tanks in this dike receive gasoline products directly from vessels during normal working hours and therefore, gasoline powered or electrical equipment in the dike area represents a potential fire/explosion hazard during tank filling operations. Alternate cleaning methods will be used for the catch basins and sewer lines in this yard.

Visual inspection of the catch basins in the dike area revealed concrete structures with 4-inch or smaller steel sewer pipes. Two catch basins, CB3T3-5 & CB3T3-7 were sampled on November 11, 2004. The analytical results were reported in Appendix C of Quarterly Report No. 3, dated March 30, 2005. The Total Petroleum Hydrocarbon (TPHC) content was 56,400 & 7,780 mg/kg respectively. With the exception of Benzo(a)pyrene (7,400 & 5,520 vs. 600 ug/kg) no contaminants were found above the NRDCSCC Levels.

3.2 TRUNK LINE No. 1 OFF SEWER MAIN No. 1

Undisturbed silt samples of the sewer structures in Trunk Line No. 1 off Sewer Main No. 1 were taken on June 15, 2005. These included sewer structures MH1T1-1, MH1T1-3, MH1T1-5(East) and MH1T1-7. Analytical results are summarized in Appendix C1, *Quarterly Analysis Summary Sewer Structures* and discussed in Section 5.1.

Sewer cleaning of 16-inch wood Trunk Line No. 1 off sewer Main No. 1 began on June 13, 2005. The trunk line joins Sewer Main No. 1 in the east chamber of CB1-5(East). Video inspection began at MH1T1-1 downstream toward the firestop elbow in CB1-5(East). The video inspection of the 16-inch wood stave sewer line revealed infiltration as listed below.

- Joint 20-foot downstream of MH1T1-1 seepage @ 04 o'clock.

The inspection ended at approximately 23.8-feet downstream because of a break in the wood pipe at 06 o'clock that the video camera was unable to negotiate. See Photo No. 2 in Appendix A, *Photos*. The closed dike gate valve could be seen from this point. If this wood sewer

is to be lined, then, this break needs to be repaired as shown in Photo No. 12, in Appendix A, *Photos*.

On June 13, 2005, the 16-inch wood sewer Trunk Line No. 1 off Sewer Main No. 1 was video inspected from MH1T1-1 upstream to MH1T1-2. Infiltration was found at several joints as listed below.

- Joint 14.3 feet upstream of MH1T1-1 seepage @ 03 o'clock.
- Joint 40.6 feet upstream of MH1T1-1 seepage @ 04 o'clock.
- Joint 81.4 feet upstream of MH1T1-1 seepage @ 08 o'clock.
- Joint 89.6 feet upstream of MH1T1-1 seepage @ 03 o'clock.
- Joint 96.6 feet upstream of MH1T1-1 seepage @ 12 o'clock.

On June 14, 2005, the 10-inch No. 1 wood lateral off Trunk Line No. 1 was video inspected from MH1T1-1 upstream toward MH1T1L1-1. Infiltration was found as listed below.

- Joint 34.1-feet upstream from MH1T1-1 seepage @ 09 o'clock.

The video inspection was blocked 35.2-feet upstream of MH1T1-1 by an obstruction @ 06 o'clock, see Photo No. 3 in Appendix A, *Photos*.

A reverse video inspection was then conducted from MH1T1L1-1 down stream to MH1T1-1. Infiltration was found as listed below

- Joint 12.3-feet downstream from MH1T1L1-1 seepage @ 09 o'clock.
- Joint 27.5-feet downstream from MH1T1L1-1 dripping @ 03 o'clock.

The video inspection ended 28.1-feet downstream from MH1T1L1-1 at the same obstruction as shown in Photo No. 3 in Appendix A, *Photos*.

The inspection of the No. 1 Lateral off Trunk Line No. 1 continued from MH1T1L1-1 upstream to MH1T1L1-2. The camera was blocked by a broken pipe 9.6-foot upstream of MH1T1L1-1 from 07 to 09 o'clock. See Photo No. 4 in Appendix A, *Photos*. If this wood sewer is to be lined, then, this break needs to be repaired as shown in Photo No. 12, in Appendix A, *Photos*.

A reverse video inspection from MH1T1L1-2 downstream to MH1T1L1-1 was conducted. The video inspection ended at the same brake in the pipe, at 21.9 feet downstream of MH1T1L1-2 from 03 to 05 o'clock. See Photo No. 5 in Appendix A, *Photos*. If this wood sewer is to be lined, then, this break needs to be repaired as shown in Photo No. 12, in Appendix A, *Photos*.

On June 14, 2005, inspection of a discovered 12-inch wood Lateral, No. 5, was conducted from MH1T1L5-1 downstream to MH1T1-1. Infiltration was found as listed below.

- Joint 9.6-feet downstream of MH1T1L5-1 seepage @ 03 o'clock.
- Joint 23.7-feet downstream of MH1T1L5-1 seepage @ 04 o'clock.
- Joint 37.3-feet downstream of MH1T1L5-1 dripping @ 12 o'clock.
- Joint 51.6-feet downstream of MH1T1L5-1 seepage @ 02 o'clock.
- Joint 58.5-feet downstream of MH1T1L5-1 seepage @ 02 o'clock.
- Separated joint 63.4-feet downstream of MH1T1L5-1.
- Off-set joint at 64.4-feet downstream from MH1T1L1-5. See Photo No. 6, Appendix A, Photos. The video inspection was terminated because the camera was unable to cross the separated joint. The sewer cannot be reverse video inspected, because of a firestop elbow in MH1T1-1.

Inspection of Lateral No. 5 continued in the 10-inch wood sewer from MH1T1L5-1 upstream to CB1T1L5-2. This catch basin was actually located by the video camera, excavated and regraded. See Photo No. 7 in Appendix A, *Photos*. Infiltration was found as listed below.

- At 19.4-feet upstream of MH1T1L5-1 dripping @ 12 o'clock.
- Joint 20.1-feet upstream of MH1T1L5-1 seeping @ 08 o'clock.

An 8-inch carbon steel lateral was found running east out of MH1T1L5-1. Approximately 20.5-feet in the pipe was bulkheaded. See Photo No. 8 in Appendix A, *Photos*. Since this sewer pipe is no longer needed it will be cut and sealed at MH1T1L5-1.

On June 14, 2005, inspection of a discovered 10-inch wood Lateral, No. 6, was conducted from MH1T1-1 upstream to a buried manhole tentatively identified as MH1T1L6-1. The line was found to have a leaky mechanical plug just a few feet from MH1T1-1.

Inspection of the 14-inch section of Trunk Line No. 1 began again on June 16, 2005, with the video inspection of the 14-inch wood sewer line from MH1T1-3 downstream to MH1T1-2. Infiltration was found as listed below.

- Joint 16.7-feet downstream of MH1T1-3, seepage @ 04 o'clock.
- At 36.2-feet downstream of MH1T1-3, broken pipe @ 04 o'clock, see Photo No. 9 in Appendix A *Photos*.
- At 48.3-feet downstream of MH1T1-3, broken pipe @ 06 o'clock, see Photo No. 10 in Appendix A *Photos*. The camera was unable to pass this point.

On June 22, 2005, the wood sewer was excavated at this break point and the broken sections of wood removed. See Photo No. 11 in Appendix A, *Photos*. A section of 12-inch plastic pipe was inserted into the ends of the wood sewer and sealed to the wood with an external rubber boot and clamps. See Photo No. 12 in Appendix A.

On June 22, 2005, the 14-inch section of Trunk Line No. 1 was video inspected from the repair point downstream to MH1T1-2. Infiltration was found as listed below.

- At 11.3-feet downstream of the repair point or approximately 59.6-feet downstream of MH1T1-3, there was infiltration running at a joint from 04 to 08 o'clock.

On June 16, 2005, the 14-inch section of Trunk Line No. 1 was video inspected from MH1T1-4 downstream to MH1T1-3. Infiltration was found as listed below.

- Joint 29.6-feet downstream of MH1T1-4, seeping @ 04 o'clock.
- Joint 41.6-feet downstream of MH1T1-4, seepage @ 08 o'clock.

On June 27, 2005, the 10-inch wood Lateral No. 2 was video inspected from MH1T1-3 upstream to MH1T1L2-1. Infiltration was found as listed below.

- Joint 28.6-feet upstream of MH1T1-3, running @ 10 o'clock.
- Joint 35.7-feet upstream of MH1T1-3, seepage @ 08 o'clock.
- At 40.3-feet upstream of MH1T1-3, gushing @ 06 o'clock.
- At 50.7-feet upstream of MH1T1-3, deformed pipe.
- Joint 51.7-feet upstream of MH1T1-3, dripping @ 12 o'clock.
- Joint 64.1-feet upstream of MH1T1-3, dripping @ 12 o'clock.

On June 16, 2005, the 10-inch wood Lateral No. 2A was video inspected from MH1T1-4, where it was discovered, upstream to MH1T1L2A-1. This manhole was discovered as a result of this video inspection and unearthed. Infiltration was found as listed below.

- Joint 38.1-feet upstream of MH1T1-4, seepage @ 07 o'clock.
- Joint 45.6-feet upstream of MH1T1-4, seepage @ 04 o'clock.

On June 16, 2005, the 12-inch wood section of Trunk Line No. 1 was video inspected from MH1T1-4 upstream to MH1T1-5. Infiltration was found as listed below.

- Seam 8.0-feet upstream of MH1T1-4, dripping @ 12 o'clock.
- Joint 26.7-feet upstream of MH1T1-4, dripping @ 12 o'clock.
- Joint 38.2-feet upstream of MH1T1-4, dripping @ 12 o'clock.

- At 65.8-feet upstream of MH1T1-4, the wood pipe is broken @ 07 o'clock. See Photo No. 13 in Appendix A, *Photos.*

On June 22, 2005, the 10-inch wood Lateral No. 3 was video inspected from MH1T1-5 upstream to LS1T1L3-1. No anomalies were found.

On June 21, 2005, the 12-inch wood section of Trunk Line No. 1 was video inspected from MH1T1-6 downstream to MH1T1-5. The inspection was abandoned 35.2-feet downstream of MH1T1-6 at a bend in the sewer that the camera could not negotiate. This was approximately 5-feet from MH1T1-5 which could be seen. No anomalies were found.

On June 21, 2005, the 12-inch wood section of Trunk Line No. 1 was video inspected from MH1T1-6 upstream to MH1T1-6A. Infiltration was found as listed below.

- Joint 12.2-feet upstream of MH1T1-6, dripping @ 12 o'clock.
- Joint 58.4-feet upstream of MH1T1-6, dripping @ 10 o'clock.

On June 23, 2005, the 12-inch wood section of Trunk Line No. 1 was video inspected from MH1T1-7 upstream to MH1T1-6A. Infiltration was found as listed below.

- Joint 12.0-feet downstream of MH1T1-7, dripping @ 12 o'clock.

On June 23, 2005, the 10-inch wood Lateral No. 4 was video inspected from MH1T1-7 upstream to CB1T1L4-1. Infiltration was found as listed below.

- Joint 10.2-feet upstream of MH1T1-7, running @ 04 o'clock.
- Joint 18.3-feet upstream of MH1T1-7, dripping @ 02 o'clock.

The inspection was abandoned at 21.2-feet upstream of MH1T1-7 because of a sever deformation of the wood pipe. See Photo No. 14 in Appendix A, *Photos.*

On June 28, 2005 a reverse video inspection of 10-inch wood Lateral No. 4 was performed from CB1T1L4-1 downstream to MH1T1-7. Infiltration was found as listed below.

- Joint 15.7-feet downstream of CB1T1L4-1, running @ 03 o'clock.
- Pipe deformed 32.8-feet downstream of CB1T1L4-1, dripping @ 12 o'clock.
- Joint 36.3-feet downstream of CB1T1L4-1, running @ 02 o'clock.
- Joint 51.1-feet downstream of CB1T1L4-1, seeping @ 02 o'clock.

The downstream video inspection ended at this point; because of the same sever deformation of the wood sewer pipe that was encountered in the upstream video inspection. See Photo No. 15 in Appendix A, Photos. The wood sewer pipe at this point is sandwiched between the concrete foundations of Tank No. 1066 and columns of an elevated pipe rack. This break cannot be repaired because of limited access and Lateral No 4 will be sealed and abandoned.

On June 27, 2005, the manhole cover on MH1T1-7A was unbolted. This manhole is outside the dike area; however access was needed to video inspect the section of 12-inch wood sewer between MH1T1-7 and MH1T1-7A. Access could not be gained from MH1T1-7 because of a cast iron elbow firestop in the manhole. The same day this line was video inspected from MH1T1-7A downstream to MH1T1-7. Infiltration was found as listed below.

- Joint 18.5-feet downstream of MH1T1-7A, running @ 09 o'clock.
- At 18.7-feet downstream of MH1T1-7A, running @ 12 o'clock. See Photo No. 16 in Appendix A, *Photos*.

On June 27, 2005, the 12-inch wood section of Trunk Line No. 1 was video inspected from MH1T1-7A upstream to MH1T1-8. The inspection was abandoned at 6.5-feet upstream from MH1T1-7A because the wood pipe was collapsed. See Photo No. 17 in Appendix A, *Photos*. Since both MH1T1-7A & MH1T1-8 are outside the dike area, this 12-inch wood section of sewer line will be cut and sealed at MH1T1-7.

3.3 REACTIVATE LATERAL(S) FROM TANK 1701 DIKE AND DECOMMISION DIKE LIFT STATION

Preparatory work required prior to cleaning and video inspection of these laterals was started in late June. On June 27, 2005, the excavation of buried manholes and sewer pipes, as well as, the removal of "Firestop" elbows was begun.

On June 29, 2005 three cast iron abandoned sewer lines were severed outside CB1L1A-1 and sealed with hydraulic cement at the open pipe end and at the catch basin as shown in Photo No. 1 in Appendix A, *Photos*.

On July 01, 2005, an attempt was made to video inspect the 12-inch Cast Iron Lateral 1A from CB3L1A-1 downstream to MH3-1(North). The inspection of the 12-inch line was abandoned because 3-feet downstream of CB3L1A-1 there was an 8-inch valve in the line that

the camera could not pass through. See Photo No. 18 in Appendix A, *Photos.*

The dike block valve was non-operational and the valve box was in a state of disrepair as shown in Photo No. 19 in Appendix A, *Photos.* The valve and valve box were repaired and access from outside the dike was provided. The dike floor was graded around CB3L1A-1 for proper drainage as shown in Photo No. 20 in Appendix A, *Photos.*

Excavation off the sewer line revealed two 45 degree elbows in the sewer line between CB3L1A-1 within the dike and downstream MH3-1(North) outside the dike.

On August 01, 2005, an attempt was made to reverse video inspect this sewer line from MH3-1(North) upstream through the two 45 degree elbows to the block valve at CB3L1A-1. The inspection was abandoned when a second block valve was found 8.8-feet upstream from MH3-1(North). See Photo No. 21 in Appendix A, *Photos.*

Subsequent excavation on September 13, 2005, revealed a gate valve without a bonnet and a short section of box wood sewer between the valve and MH3-1. See Photo No. 22 in Appendix A, *Photos.*

On September 14, 2005, the valve bonnet was sealed with hydraulic cement and a section of PVC pipe was laid in the wood box sewer from the valve to MH3-1. See Photo No. 23 in Appendix A, *Photos.* An abandoned 6-inch steel line that entered MH3-1 adjacent to the new PVC line was cut in preparation for sealing. A form was constructed at the manhole wall in preparation for pouring concrete to seal the PVC pipe to the manhole. On September 19, 2005, concrete was poured to seal the PVC pipe, as well as, plug the 6-inch steel line and hole in the manhole.

On July 01, 2005, the 12-inch cast iron sewer Lateral 1A was video inspected from CB3L1A-2 downstream to CB3L1A-1 in the adjacent dike. The inspection was abandoned 19.7-feet downstream of CB3L1A-2 where infiltration was running through a gate valve with a broken valve stem. No other anomalies were found.

The same day a reverse video inspection was performed from CB3L1A-1 upstream to CB3L1A-2. Infiltration was found as listed below.

- A hole in the top of the pipe 50.1-feet upstream of CB3L1A-1. See Photo No. 24 in Appendix A, *Photos.* This hole still needs to be repaired.

The video inspection ended 55.2-feet upstream of CB3L1A-1 at the same faulty valve. This valve was repaired. At the same time three abandoned cast iron lines were cut and sealed at CB3L1A-2. See Photo No. 25 in Appendix A, *Photos.*

With the sewer now flowing, the dike block valve accessible and operational, the lift station in manhole LS1L2-1 was removed from service. The above ground piping was removed and LS1L2-1 was filled as part of the grading around CB3L1A-1.

3.4 MISCELLANEOUS LINES OFF SEWER MAIN No. 1

On August 02, 2005, a buried manhole, CB1L1-1, by the transfer pumps south of Tank 1701 was excavated. This catch basin flows through a cast iron line to a valve outside the dike and then to CB1-5(East). Previous visual observations in CB1-5(East) indicate the sewer enters as a wood box sewer. The section of wood box sewer between the valve and CB1-5(East) will be replaced, the sewer line will then be cleaned and video inspected from CB1-5(East) upstream to CB1L1-1. Three abandoned sewer lines in CB1L1-1 will also be sealed.

On August 03, 2005, the 10-inch wood sewer line from CB1T2-1A upstream to an unknown source was video inspected. At 19.1-feet upstream of CB1T2-1A a hole was found @ 06 o'clock. See Photo No. 26 in Appendix A, *Photos.* This sewer line is no longer used and it will be cut and sealed at CB1T2-1A.

No other work was performed on the remaining small laterals and abandoned sewer lines off Sewer Main No. 1 during the quarter because of higher priorities. Work will progress on this next quarter as priorities allow.

3.5 LINING WOOD SEWERS MAIN No. 1, TRUNK LINES 1 & 2

A Scope of Work Specification for lining Trunk Lines No. 1 and No. 2 off Sewer Main No. 1 was written during the quarter. A copy can be found attached as Appendix F, *Scope of Work Yard 1 Storm Sewer Wood Pipe Lining.*

Requests for quotations from contractors to perform this work will be obtained by the end of the year. These will be evaluated against the cost of installing new Ductile Iron sewers.

3.6 SURVEY WORK

On July 5, 2005 forty-five sewer structures were surveyed by Borbas Surveying and Mapping, L.L.C. These structures are shown on IMTT Drawing F-1662, *West Side Sewer Layout (South Section),* Rev. No. 2, 9/30/2005. In addition the NJ co-ordinate and elevation data has been added to Appendix B1, *Sewer Structure Inspection Form*, and B2, *Sewer Line Inspection Form.*

There are still several existing structures that need surveying and it is anticipated that additional new structures or structures found through the video inspections will be unearthed. As a result survey work will be an ongoing work item for the duration of Phase I of the Sewer Remedial Investigation.

3.7 UPDATE SEWER LAYOUT DRAWINGS

As a result of survey work and the video inspections enclosed IMTT Drawing F-1662, *West Side Sewer Layout (South Section),* Rev. No. 2, 9/30/2005, has been updated. It is anticipated that updating of both IMTT Drawing F-1662 & F-1663 will be an ongoing work item for the duration of Phase I of the Sewer Remedial Investigation.

3.8 PRELIMINARY WORK ON SEWER MAINS No. 2

On August 31 an undisturbed silt sample was taken in Sewer Main No. 2 at MH2-2. This is in the middle of a 36-inch wood barrel stave sewer that is a candidate for abandonment. The analytical results can be found in Appendix C1, *Quarterly Analysis Summary Sewer Structures* and are discussed in Section 5.1. Previously samples in Sewer Main No. 2 had been taken and reported in Quarterly Report No. 1, dated June 11, 2004.

During the week of October 13, 2004, the silt in CB2-5 was partially removed in order to visually inspect the sewer connections in this catch basin to determine their materials of construction. At that time it was determined that the inlet from the north was 24-inch and the outlet to the east was 36-inch. Both were of wood barrel stave construction. The cleaning and video inspection of the sewer lines in Sewer Main No. 2 started at this Catch Basin on August 08, 2005.

On August 22, 2005 the 24-inch wood Sewer Main No. 2 was video inspected from CB2-5 upstream to CB2-6. Approximately 22-feet upstream from CB2-5 a hard material similar to concrete was

encountered on the floor of the wood sewer. The camera was unable to pass through the reduced cross section and the video inspection was abandoned at this point. Attention then turned to the sewer downstream from CB2-5.

On August 25 the 36-inch wood Sewer Main No. 2 was video inspected from CB2-5 downstream to CB2-4. The sewer materials of construction changed from wood to corrugated metal 20-foot downstream from CB2-5. The video inspection revealed a 35-foot section of corrugated metal pipe under the main roadway to the truck scales. The last 10-foot of this corrugated pipe was severely corroded and contained multiple holes from the 03 to 05 o'clock position. See Photo No. 27 in Appendix A, *Photos*. No infiltration was observed and it is not known if the holes are all within the portion of the corrugated metal pipe that was inserted within the 36-inch wood sewer pipe.

The sewer pipe material of construction changed back to 36-inch wood at 55-foot downstream from CB2-5. The sewer was blocked with silt at this point and the camera could not pass. The video inspection ended and attention was again turned to the section upstream from CB2-5.

On August 30, 2005, a video inspection was performed from CB2-7 downstream to CB2-6. The sewer material of construction at CB2-7 was found to be 24-inch cast iron as opposed to the 24-inch wood at CB2-6. Approximately 50-feet downstream from CB2-7 an unknown buried brick manhole was encountered and tentatively identified as MH2-6B. The camera was blocked by this manhole and the video inspection was abandoned. At this point attention was turned to Sewer Main No. 4 to determine the sewer's materials of construction.

3.9 PRELIMINARY WORK ON SEWER MAIN No. 4 SOUTH OF THE RAILROAD TRACKS

On August 31 an undisturbed silt sample was taken in the first structure in Sewer Main No. 4 (CB4-1) after the connection with sewer Main No. 2. Prior to this CB4-1 had been cemented closed. The unofficial analytical results can be found in Appendix C1, *Quarterly Analysis Summary Sewer Structures* and are discussed in Section 5.1.

On September 11, 2005, 36-inch Sewer Main No. 4 was video inspected from CB4-1 upstream toward CB4-3, otherwise known as the "corral". The connection at the manhole was cast iron, however, 4-feet in it turned into a 36-inch wood barrel stave sewer. Approximately 65-feet upstream from CB4-1 a 45-degree cast iron elbow was encountered turning eastward. The camera could not pass through the elbow and

the video inspection was abandoned. However, it was determine that the sewer pipe material of construction on the other side of the elbow was wood. At this time attention turned to the 12-inch wood Trunk Line No. 1 off Sewer Main No. 4 in CB4-1.

On September 12, 2005 the 12-inch wood Trunk Line No. 1 was video inspected from CB4-1 upstream toward catch basin CB4T1-1. Infiltration was found as listed below.

- Joint 58.5-feet upstream of CB4-1, seepage.
- Joint 78.2-feet upstream of CB4-1 @ joint to Cast Iron 45-Elbow.

The camera could not pass through the elbow and the video inspection was abandoned. However, a buried structure could be seen approximately 10-foot upstream of the elbow. On September 13, 2005, excavation revealed that the structure was a 1-foot by 3-foot wood box sewer. See Photo No. 28 in Appendix A, *Photos*.

On September 14, 2005, the video inspection of Lateral No. 1 off Sewer Main No. 4 continued from the point where the wood box sewer was excavated and opened upstream toward catch basin CB4T1-1. Approximately 30-foot upstream from the excavation two 4-inch steel lines from unknown sources enter through the top of the box sewer along the west (left) side. See Photo No. 29 in Appendix A, *Photos*. One or both of these lines are believed to be from CB4T1-1.

Approximately 73-feet upstream from the point of the opened wood box sewer a 4-inch line entered from the east wall and ended in a downward facing elbow. This is the sewer line is from an unknown source. On September 15, 2005, the wood box sewer was again excavated and opened at this point in order to retrieve a jet rodder nozzle that was jammed under this elbow.

The end of the wood box sewer is approximately 6-feet from this second excavation. Video inspection on September 20, 2005, revealed a sealed service connection in the east (left) wall. See Photo No. 30 in Appendix A, *Photos*. At the end of the wood box sewer there was a 6-inch cast iron pipe entering from the east (left) which is believed to come from the trench drain (CB4T1L1-1) at the abandoned loading rack to the east. The box sewer continued at a 45-degree angle to the east in a 12-inch cast iron sewer toward CB4T1-2. See photo No. 31 in Appendix A, *Photos*.

Future work in this area of the terminal will concentrate on identifying wood sewers and locating old abandoned cast iron sewers in order to redirect the sewer flow from wood to metal sewer pipes.

4.0 INSPECTION RESULTS

Updated *Sewer Structure Inspection Forms* are found attached in Appendix B1 and Updated *Sewer Line Inspection Forms* are found in Appendix B2. The EQUIS-UID Sewer Inspection Sheets and a copy of all completed final video inspections performed this quarter are found attached in Appendix G.

4.1 REPAIRS

Inspection of wood sewer lines during this quarter revealed infiltration at several joints, however, the overall condition of the wood stave pipe was good except as noted below in Table 4-1, *Sewer Lines Needing Repair.*

Based on the general condition of the wood sewers, it was decided to initiate an Engineering Study to line the wood sewers with cured in-place plastic versus replacement with Ductile Iron sewer pipe. As part of the Engineering Study the Engineering Specification, Scope of Work BA-0506 for, *Yard 1 Storm Sewer Wood Pipe Lining — Yard 1A, Sewer Main #1, Trunk Line #1 — Yard 1C, Sewer Main #1, Trunk Line #2* was prepared. A copy of this Engineering Specification can be found attached in Appendix F.

If plastic lining of the wood sewers is to proceed, the wood sewers listed below in Table 4-1, *Sewer Lines Needing Repair*, should be repaired with PVC inserts as shown in Photo No. 13 in Appendix A, *Photos.*

TABLE 4 – 1
SEWER LINES NEEDING REPAIR

BETWEEN		SIZE	STATUS
CB1-5East	MH1T1-1	16-Wood	Needs to be done.
MH1T1L1-1	MH1T1-1	10-Wood	Needs to be done.
MH1T1L1-2	MH1T1L1-1	10-Wood	Needs to be done.
MH1T1-3	MH1T1-2	14-Wood	Repaired June 22, 2005
CB1T1L4-1	MH1T1-7	10-Wood	To be sealed & abandoned.
MH1T1-8	MH1T1-7A	12-Wood	To be sealed & abandoned.
VALVE 1701 East	MH3-1North	Wood Box	Replaced with PVC Pipe on September 14, 2005
VALVE 1701 South	CB1-5East	Wood Box	To be replaced with PVC.
CB3L1A-2	CB3L1A-1	12 – C.I.	Hole needs to be repaired.

4.2 BLOCKAGE OF ABANDONED SEWERS

Several sewer lines were identified this quarter as no longer needed and are candidates to be cut off at a structure and both the pipe end and the hole in the structure sealed with hydraulic cement. These sewer lines are listed below in Table 4-2,

TABLE 4 – 2

ABANDONED SEWER CONNECTIONS NEEDING SEALING

STRUCTURE	SIZE	MATERIAL	STATUS
CB1L1-1	4-West	Cast Iron	Needs to be sealed.
	4-North	Cast Iron	Needs to be sealed.
	4-East	Cast Iron	Needs to be sealed.
MH1T1-1	10-West	Wood	Sealed on 6-15-2005.
MH1T1L5-1	4-East	Cast Iron	Needs to be sealed.
MH1T1-7	10-West	Wood	Needs to be sealed.
	12-South	Wood	Needs to be sealed.
CB2-7	10-West	Cast Iron	Needs to be sealed.
	10-West	Cast Iron	Needs to be sealed.
	4-West	PVC Perforated	To bed replaced with 4" Cast Iron.
	6-East	Steel Screwed	Needs to be sealed.
	6-East	Steel Flanged	Sealed with blind flange.
MH3-1 North	6-East	Steel	Sealed on 9-14-2005.
	6-North	Steel	Needs to be sealed.
CB3L1A-1	8-East	Cast Iron	Sealed on 6-27-2005.
	8-North	Cast Iron	Sealed on 6-27-2005.
	8-South	Cast Iron	Sealed on 6-27-2005.
CB3L1A-2	12-North	Cast Iron	Sealed on 6-30-2005.
	4-East	Cast Iron	Sealed on 6-30-2005.
	4-West	Cast Iron	Sealed on 6-30-2005.

5.0 ANALYTICAL RESULTS

Analytical results are summarized in attached Appendix C1, *Quarterly Analysis Summary Sewer Structures* and C2, *Quarterly Analysis Summary Sewer Silt Disposal.* A paper copy of the Aqua Pro-Tech Laboratories NJDEP deliverables for the PP+40 characterization analysis and the ECO Test Laboratories NJDEP Deliverables for the TCLP disposal analysis are provided along with this quarterly report as Appendix F in a separate binder. Electronic Data Deliverables (EDD) Diskettes are included for this analytical work, as well as, the analytical work reported last quarter.

5.1 CATCH BASIN SEDIMENT

Undisturbed silt samples of the sewer structures in Trunk Line No. 2 off Sewer Main No. 1 were taken on June 02, 2005. These included sewer structures CB1T2-1, CB1T2-2 and CB1T2L2-1, as these were the only structures that were not buried.

Zinc levels exceeding Non Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) was found in CB1T2-2 (2,400 vs.1,500 mg/kg), as well as copper levels (734 vs. 600 mg/kg) that exceed NRDCSCC.

Arsenic levels exceeding NRDCSCC were found in both CB1T2-2 (33.4 vs. 20 mg/kg) and CB1T2L2-1 (59.3 vs. 20 mg/kg).

Undisturbed silt samples of the sewer structures in Trunk Line No. 1 off Sewer Main No. 1 were taken on June 14, 2005. These included sewer structures MH1T1-1, MH1T1-3, MH1T1-5 and MH1T1-7.

Arsenic levels exceeding NRDCSCC were found in all four samples (60, 34.5 72 & 43.4 vs. 20 mg/kg). In addition lead levels exceeding NRDCSCC were found in MH1T1-5 (3,370 vs. 600 mg/kg) and MH1T1-7 (2,300 vs. 600 mg/kg).

Copper levels exceeding NRDCSCC were also found in MH1T1-3 (1,380 vs. 600 mg/kg) and MH1T1-7 (1,050 vs. 600 mg/kg). In addition zinc levels exceeding NRDCSCC was also found in MH1T1-5 (4,430/1,500 mg/kg).

Pentachloro phenol levels exceeding NRDCSCC was found in MH1T1-1 (30,900 vs. 24,000 ug/kg).

Benzo(a)anthracene levels exceeding NRDCSCC were found in MH1T1-1 (18,000 vs. 4,000 ug/kg), MH1T1-5 (11,700 vs. 4,000 ug/kg) and MH1T1-7 (12,800 vs. 4,000 ug/kg). In addition Benzo(b) fluoranthene levels exceed NRDCSCC were found in MH1T1-1 (9,110 vs. 4,000 ug/kg) and MH1T1-5 (6,390 vs. 4,000 ug/kg).

On August 31 an additional undisturbed silt sample was taken in Sewer Main No. 2 at MH2-2. At the same time an undisturbed silt sample was taken in the first structure in Sewer Main No. 4 (CB4-1) after the connection with sewer Main No. 2. Prior to this CB4-1 had been cemented closed.

Unofficial results show levels of arsenic, copper, lead and Benzo(a)anthracene that exceeded NRDCSCC. Official results will be reported in the next quarterly report after receipt of the Qa/Qc deliverables package.

On September 20 undisturbed silt samples were obtained from previously buried CB4-2A and an excavated unknown manhole, tentatively identified as MH4T1-7. This manhole was located from a 1950 Tide Water Drawing No. E-1292, which showed a previously unknown 24-inch cast iron sewer in the vicinity of CB4-2A. Preliminary analytical results for heavy metals analysis showed levels of arsenic, lead and copper that exceed NRDCSCC. Final results will be reported in the next quarterly report after receipt of the Qa/Qc deliverables package.

5.2 SEDIMENT DISPOSAL SAMPLES

Sediment cleaned from the sewers is decanted through a portable oil water separator. The solids are then place in roll-off container No. EQ-224 and the water was sent to the Westside Wastewater Treatment Plant. Roll-off EQ-224 was sampled and analyzed for TCLP. The results are summarized in Appendix C2, *Quarterly Analysis Summary Sewer Silt Disposal.*

Sediment was then divided up and placed in several other roll-offs where it was solidified with lime kiln dust and/or polymer prior to off-site disposal. Waste manifests are located in Appendix D, *Sewer Silt Manifests.* A summary of the quantities shipped for disposal are found in Table 5-2, *Sewer Silt Disposal*, below.

TABLE 5-2

SEWER SILT DISPOSAL

DATE	MANIFEST No.	DISPOSAL LOCATION	ROLL-OFF No.	WEIGHT POUNDS
7/21/2005	Q 69407	Clean Earth of Carteret	EQ 224	46,960
8/31/2005	*	*	EQ-235	*
8/31/2005	*	*	R3217RT	*

* Roll-off containers EQ-235 and R3217RT have not been shipped yet, because of TCLP lead levels that exceed hazardous waste criteria. IMTT is pursuing various disposal locations at this time. Final weights and disposition will be reported in the next Quarterly Report No. 6.

6.0 SCHEDULE & RECOMMENDATIONS

6.1 SCHEDULE

Because the sewer cleaning is done with high pressure water supplied unheated from a tank truck, it was decided for safety reasons to suspend the sewer cleaning and hence video inspection during the winter. Therefore the updated schedule attached in Appendix H, shows a "winter weather break" from the week before Christmas until the first Monday in March.

The schedule shows the remaining sewer mains being cleaned and video inspected in numerical order. The actual order of cleaning and video inspection may change based on evolving needs and perceived potential environmental impact.

6.2 RECOMMENDATIONS

The following recommendations are made for the fourth quarter of 2005.

6.2.1 Clean, video inspect and repair as necessary Sewer Main No. 2. Initiate engineering study to determine how to redirect sewer flow from wood to metal sewer lines.

6.2.2 Clean, video inspect and repair as necessary Sewer Main No. 4 in the sections south of the railroad tracks. Initiate engineering study to determine how to redirect sewer flow from wood to metal sewer lines.

6.2.3 Obtain bids for the lining of wooden Trunk Lines 1 & 2 off Sewer Main No. 1 and use this information to determine whether to line them or replace them with Ductile Iron Construction.

6.2.4 Repair as necessary the Tank 1701 dike drain to the south into Sewer Main No. 1.

6.2.5 Clean and video inspect as time permits minor laterals and abandoned sewer lines off Sewer Mains No. 1 & No. 2.

6.2.6 Continue surveying new or excavated sewer structures.

6.2.7 To continue updating the Westside Sewer Layout Drawings F-1662, South Section and F-1663, North Section, as well as, the project schedule.

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APPENDIX B1
SEWER STRUCTURE INSPECTION FORM

PROJECT No. BA - 0507
DESCRIPTION SEWER INSPECTION
CALCULATED BY BTT DATE 30-Sep-2005
CHECKED BY DATE

Structure No.	NJ Coordinates NAD 83 North	NJ Coordinates NAD 83 East	Elevations in feet NAD 83 Rim	North	South	East	West	Inspection Date	Structure Type	Construction	Cover	Sampled	Depth Bottom	Depth Silt	Depth Water	Comments & General Condition
	SEWER MAIN #1		T.O.C.	24" C.I. IN	36" Wood IN	54" D.I. to PK	48" C.I. IN				Above Grade					
LS1-1	663,381.9080	600,475.9310	10.4840	2.6090	BLOCKED	BLOCKED	-0.7660	11-May-2004	Manhole	Concrete	Grate	24-Feb-04	-1.391		7.4840	Lift Station to API Separator.
MH1-2	663,388.0910	600,390.5360	10.8290			42" C. I. IN	48" C. I. OUT		Manhole	Concrete	Solid		NA	NONE	NONE	Raised concrete, no actually access to sewer pipe. Concrete form around 42/48" miter joint.
MH1-3	663,321.0660	600,357.1230	8.5220						Manhole	Concrete Block	Raised Open			Free Prod.		Raised concrete, actually a lateral not in main.
MH1-3A	663,349.0000	600,350.2000	7.7000	7" Conc. BLOCKED	12" Sq. Conc. 3.2833 12" Sq. Conc. 3.2833	42" C.I. OUT -0.4687	42" C.I. IN -0.4687	8-May-2004	Manhole	Concrete	Buried Solid		-1.3000	2.2000		Discovered buried manhole under RR tracks. Unearthed and manhole cover opened.
CB1-3B	663,280.4499	600,383.4111	8.8052						Catch Basin	Concrete	Grate					ROADWAY DRAINAGE.
CB1-3C	663,285.6238	600,428.7467	8.8764						Catch Basin	Concrete	Grate					ROADWAY DRAINAGE.
CB1-3D	663,271.8403	600,320.3251	9.1460						Catch Basin	Concrete	Grate					ROADWAY DRAINAGE.
CB1-4	663,283.9729	600,249.5092	T.O.C. 8.8124	24" C.I. IN 4" C.I. IN	4" C.I. IN 7.9791 2" C.S. IN	42" C.I. OUT 0.3124	42" C.I. IN 0.3124	10-May-2004	Catch Basin	Concrete Block	Raised Open	24-Feb-04	-0.6876	3.6791	7.8124	Walls cracked, free product.
CB1L1A-1	663,398.7389	600,221.0075	8.668						Catch Basin	Concrete	Grate					ROADWAY DRAINAGE.
East CB1-5 West	663,210.7000 663,208.4000	600,122.4000 600,119.4000	8.7000 8.8000	WOOD BLOCKED	16" C.I. IN 3.1333	42" C.I. OUT 1.2000	42" C.I. IN 1.4000	10-May-2004	Manhole	Concrete	Solid	22-Mar-2004	-0.5333	3.9667	6.4000	Buried, unearthed and concrete cover removed.
CB1L1-1																UNEARTHED
CB1-6	663,144.2004	600,016.5706	10.4360	24" C.I. IN 8" C.S. IN from ABOVE	8" C.S. IN from ABOVE	42" C.I. OUT 4.4360 8" WOOD IN BLOCKED	36" C.I. IN 4.4360 14" WOOD 8" C.I.	10-May-2004	Manhole	Concrete	Solid	24-Feb-2004 22-Mar-2004	2.936	6.7893	8.636	Partially unearthed and concrete cover removed. Necessary because of offset deep manhole.
LS1L2-1	663,343.9120	599,994.5420	8.883						Catch Basin	Steel	Open					
East CB1-7 West	663,108.0680 663,103.3840	599,959.0430 599,954.7920	7.8900 7.8600		24" C.I. IN 6" C.I. IN	36" C.I. OUT 3.4400 12" C.S. Above Ground UNDERFLOW OUT	UNDERFLOW IN 24" C.I. IN 3.4400	10-May-2004	Baffled Box	Concrete	Solid Open	15-Mar-2004	2.3567	4.2733 -0.3400	5.6600	East compartment was buried, had to be unearthed. West compartment was buried, had to be unearthed. West Compartment free product.
East CB1-8 West	663,010.1520 663,007.2780	599,802.1570 599,797.1010	11.2510 11.2200	24" C.I. IN	~~12" C.I. IN~~ REMOVED	24" C.I. OUT 4.3343 UNDERFLOW OUT	UNDERFLOW IN 12" D. I. IN 3.3410	8-May-2004	Baffled Box	Concrete	Grate Solid		2.9200	5.3367		West compartment was buried, had to be unearthed.
~~CB1-9~~ FILLED WITH CONCRETE ON 02 NOV. 2004	~~663,975.3249~~	~~599,744.8317~~	~~11.5191~~	~~10" C.I. Elbow 9.1958~~ ~~8" C.I. Elbow 9.0191~~ ~~2" C.S. From Above~~	~~14" WOOD IN 4.4358~~	~~14" WOOD OUT 3.6858~~	~~10" C.I. IN 6.8524~~	~~10-May-2004~~	~~Catch Basin~~	~~Brick~~	~~Open~~		~~2.2661~~	~~4.3524~~		
~~CB1L2-1~~ FILLED WITH CONCRETE ON 02 NOV. 2004	~~663,961.8229~~	~~599,707.9751~~	~~11.955~~													

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PROJECT No. BA - 0507
DESCRIPTION SEWER INSPECTION
CALCULATED BY BTT DATE 30-Sep-2005
CHECKED BY DATE

Structure No.	NJ Coordinates NAD 83 North	NJ Coordinates NAD 83 East	Elevations in feet NAD 83 Rim	North	South	East	West	Inspection Date	Structure Type	Construction	Cover	Sampled	Depth Bottom	Depth Silt	Depth Water	Comments & General Condition
~~CB1-10~~	~~662,918.0410~~	~~599,790.7140~~		~~14" WOOD OUT~~	~~12" WOOD IN~~		~~12" WOOD IN~~									
~~FILLED WITH CONCRETE ON 02 NOV. 2004~~			~~10.1240~~	~~4.3740~~	~~7.1240~~		~~4.5407~~	~~10-May-2004~~	~~Catch Basin~~	~~Brick~~	~~Grate~~		~~4.124~~	~~17.1240~~		~~Buried, had to be unearthed.~~
~~CB1L4-1~~	~~662,887.1570~~	~~599,734.0040~~	~~10.5020~~		~~12" WOOD IN~~	~~12" WOOD OUT~~	~~8" C.I. IN~~									
~~FILLED WITH CONCRETE ON 02 NOV. 2004~~					~~7.502~~	~~6.2353~~	~~8.5853~~	~~9-Mar-2004~~	~~Catch Basin~~	~~Brick~~	~~Grate~~		~~4.3353~~	~~9.0853~~		~~Buried, had to be unearthed.~~
							~~4" C.I. IN~~									
							~~9.0020~~									
				~~12" WOOD OUT~~	~~12" WOOD IN~~	~~4" C.I. IN~~										
~~CB1L4-2~~				~~-2.5000~~	~~-2.5000~~	~~-0.9187~~		~~8-Mar-2004~~	~~Catch Basin~~	~~Brick~~			~~-5.0833~~	~~-2.4187~~		~~Buried, had to be unearthed.~~
~~FILLED WITH CONCRETE ON 02 NOV. 2004~~				~~3" C.I. IN~~	~~3" C.I. IN~~	~~3" C.I. IN~~										
				~~-1.6000~~	~~-1.2500~~	~~-1.5000~~										
				~~12" WOOD OUT~~	~~6" C.I. IN~~											
~~CB1L4-3~~	~~662,895.2832~~	~~599,861.5391~~	~~10.4514~~	~~8.0247~~	~~9.2847~~			~~5-Mar-2004~~	~~Catch Basin~~	~~Brick~~	~~Grate~~		~~6.7847~~	~~9.4514~~		~~Buried, had to be unearthed.~~
~~FILLED WITH CONCRETE ON 02 NOV. 2004~~				~~4" C.I. IN~~	~~4" C.I. IN~~											
				~~9.8181~~	~~9.4514~~											
					~~4" C.I. IN~~											
					~~9.4514~~											
				~~12" WOOD OUT~~	~~12" WOOD IN~~	~~2" C.S. IN~~										
~~CB1-11~~	~~662,805.0642~~	~~599,844.2929~~	~~10.1971~~	~~7.3638~~	~~7.5304~~	~~9.1138~~		~~11-May-2004~~	~~Catch Basin~~	~~Brick~~	~~Grate~~	~~24-Feb-2004~~	~~5.0304~~	~~9.1971~~	~~8.1971~~	~~Sheen.~~
~~FILLED WITH CONCRETE ON 02 NOV. 2004~~						~~2" C.S. IN~~										
						~~9.1971~~										
				~~12" WOOD OUT~~	~~12" WOOD IN~~	~~6" C.I. IN~~	~~6" C.I. OUT~~									
~~CB1-12~~	~~662,890.8360~~	~~599,814.5182~~	~~9.8481~~	~~7.7704~~	~~7.9481~~	~~8.9481~~	~~11.1129~~	~~11-May-2004~~	~~Catch Basin~~	~~Brick~~	~~Grate~~	~~24-Feb-2004~~	~~5.9481~~	~~8.4481~~		~~West Side Recovery entrance, sheen.~~
~~FILLED WITH CONCRETE ON 02 NOV. 2004~~						~~2" C.S. IN~~										
						~~Above Ground~~										
~~CB1-13~~									~~Catch Basin~~	~~Brick~~	~~Solid~~					~~Buried, removed as part of new sewer installation.~~
~~REMOVED ON 26 OCTOBER, 2004~~																
				12" D. I. OUT	12" D. I. IN											
MH1-9A	662,980.1412	599,801.2113	10.3840	6.3810	6.2210			10-Aug-2004	Man Hole	Concrete	Solid	NA	2.9200	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW					FS EL 5.157											
				12" D. I. OUT	12" D. I. IN		C.B. 8" D.I. IN									
CB1-10A	662,898.0499	599,779.8990	10.0660	6.3310	6.0410		5.4660	16-Aug-2004	Catch Basin	Concrete	Grate	NA	2.6000	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW					FS EL 4.977		FS EL 4.646									
CB1-10W	662,886.0936	599,742.7821	10.716			8" D.I. OUT		24-Aug-2004	Catch Basin	Concrete	Grate	NA	6.9300	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW						7.0560										
MH1-11A	662,802.7790	599,824.4835	11.3687	12" D. I. OUT	12" D. I. IN	C.B. 8" D. I. IN	C.B. 8" D.I. IN	14-Sep-2004	Man Hole	Concrete	Solid	NA	4.8700	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW				6.0960	6.2010	7.0860	4.6760									
CB1-11E	662,812.6833	599,842.2189	9.6877				8" D.I. OUT	16-Sep-2004	Catch Basin	Concrete	Grate	NA	7.1300	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW							7.1960									
CB1-11W	662,789.9673	599,796.7925	10.4642			8" D.I. OUT		16-Sep-2004	Catch Basin	Concrete	Grate	NA	5.1650	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW						5.3710										
MH1-12A	662,683.8364	599,891.6136	11.7054	12" D. I. OUT	12" D. I. IN	C.B. 8" D. I. IN	C.B. 8" D.I. IN	22-Sep-2004	Catch Basin	Concrete	Grate	NA	4.0100	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW				6.2510	6.3210	6.4460	5.0060									
CB1-12E	662,684.8409	599,909.0761	9.5911				8" D.I. OUT	23-Sep-2004	Catch Basin	Concrete	Grate	NA	7.0400	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW							7.1660									
CB1-12W	662,666.8456	599,865.3345	10.4247			8" D.I. OUT		23-Sep-2004	Catch Basin	Concrete	Grate	NA	7.3800	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW						7.4460										
MH1-13A	662,628.9702	599,924.2674	12.0493	12" D. I. OUT		12" D. I. IN	C.B. 8" D.I. IN	5-Oct-2004	Man Hole	Concrete	Solid	NA	4.1400	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW				6.7610		6.9010	4.8060									
CB1-13W	662,589.1411	599,896.6047	10.8052			8" D.I. OUT		5-Oct-2004	Catch Basin	Concrete	Grate	NA	6.0300	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW						6.0660										
MH1-14A	662,602.3917	599,952.4286	14.5681	C.B. 8" D. I. IN		8" D. I. IN	12" D.I. OUT	20-Oct-2004	Man Hole	Concrete	Solid	NA	5.8100	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
NEW				8.1660		6.9360	11.1040									

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APPENDIX B1
SEWER STRUCTURE INSPECTION FORM

PROJECT No. BA - 0507
DESCRIPTION SEWER INSPECTION
CALCULATED BY BTT DATE 30-Sep-2005
CHECKED BY DATE

Structure No.	NJ Coordinates NAD 83 North	NJ Coordinates NAD 83 East	Elevations in feet NAD 83 Rim	Elevations in feet NAD 83 North	Elevations in feet NAD 83 South	Elevations in feet NAD 83 East	Elevations in feet NAD 83 West	Inspection Date	Structure Type	Structure Construction	Structure Cover	Structure Sampled	Depth Bottom	Depth Silt	Depth Water	Comments & General Condition
CB1-14N NEW	662,818.2601	599,852.5917	10.7423		8" D.I. OUT 8.3180			20-Oct-2004	Catch Basin	Concrete	Grate	NA	6.2600	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
MH1-15A NEW	662,622.5231	599,985.5138	12.9410		C.B. 8" D. I. IN 7.9760	BLOCKED 8" D. I. IN 7.3190	6" D.I. OUT 7.2260	28-Oct-2004	Man Hole	Concrete	Solid	NA	6.2800	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
CB1-1-15S NEW	662,805.7030	599,993.9457	12.5376	8" D.I. OUT 9.9510				28-Oct-2004	Catch Basin	Concrete	Grate	NA	9.8400	NA	NA	PART OF YARD #1 NEW SEWER SYSTEM
SEWER MAIN #1 TRUNK #1																
MH1T1-1	663,160.4272	600,150.0339	8.391						Man Hole	Concrete Block	Elevated Open	14-Jun-2005				
MH1T1L1-1	663,126.0174	600,098.6983	8.626						Man Hole	Concrete Block	Elevated Open					
MH1T1L1-2	663,155.9519	600,086.2859	8.510						Man Hole	Concrete Block	Elevated Open					
MH1T1L5-1	663,189.9810	600,218.9790	9.8434						Man Hole	Concrete Block	Elevated Open					
MH1T1L5-2	663,157.1684	600,234.3258	7.8787						Man Hole	Concrete Block	Grate	NA				Excavated and brought to grade.
MH1T1L8-1 ABANDONED												NA				Never excavated, abandoned as no longer needed.
MH1T1-2	663,091.1044	600,248.4361	5.624						Man Hole	Concrete Block	Elevated Open					
MH1T1-3	663,003.8979	600,269.0119	6.410						Man Hole	Concrete Block	Elevated Open	14-Jun-2005				
MH1T1L2-1	662,968.2362	600,200.7871	5.780						Man Hole	Concrete Block	Elevated Open					
MH1T1-4	662,931.1425	600,305.6628	6.435						Man Hole	Concrete Block	Elevated Open					
MH1T1L2A-1	662,891.8136	600,235.8139	6.6700						Man Hole	Concrete Block	Grate	NA				Excavated and brought to grade.
MH1T1-5	662,851.8559	600,307.8537	6.192						Man Hole	Concrete Block	Elevated Open	14-Jun-2005				
LS1T1L3-1	662,840.2647	600,283.1306	7.996						Lift Station	Concrete Block	Elevated Open					
MH1T1-6	662,860.8873	600,352.2107	6.035						Man Hole	Concrete Block	Elevated Open					
MH1T1-6A									Man Hole	Concrete Block	Elevated Open					
MH1T1L8-1																
MH1T1-7	662,789.5189	600,368.9884	6.942						Man Hole	Concrete Block	Elevated Open	14-Jun-2005				

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Structure No.	NJ Coordinates NAD 83		Elevations in feet NAD 83					Inspection Date	Structure				Depth			Comments & General Condition
	North	East	Rim	North	South	East	West		Type	Construction	Cover	Sampled	Bottom	Silt	Water	
CB1T1L4-1	662,767.8497	600,297.3837	9.451						Catch Basin	Concrete Block	Elevated Open					
LS1T1L7-1	662,750.9790	600,353.5062	8.8000						Lift Station	Concrete	Grate					Within concrete dike around tank #1034.
MH1T1-7A	662,765.1540	600,382.3017	7.9550						Man Hole	Concrete Block	Solid					Cover bolted on at grade.
MH1T1-8	662,738.2314	600,396.2039	5.546						Man Hole	Concrete Block	Elevated Open					
MH1T1-9 ABANDONED																Never excavated, abandoned in place as no longer used.
SEWER MAIN #1 TRUNK #2																
CB1T2-A	663,176.9981	599,965.7068	8.8779	2.3779	2.3382			8-Jun-2005	Catch Basin	Brick	Grate	NA	1.4779			4' dia. Excavated and brought to grade.
				14" WOOD IN	16" WOOD OUT			29-Jun-2005								10" WOOD south to be sealed.
					2.8779											
					10" WOOD in											
CB1T2-1	663,195.4307	599,935.0006	6.879					6-Jun-2005	Catch Basin	Brick	Elevated Open	2-Jun-2005				4' dia.
					14" WOOD OUT	3" CS IN	14" WOOD IN	8-Jun-2005								3" CS surface drain; valved.
CB1T2-2	663,180.8634	599,876.8109	5.478					6-Jun-2005	Catch Basin	Brick	Elevated Open	2-Jun-2005				4' dia.
				14" WOOD IN		14" WOOD OUT										6" CS surface drain; valved.
																High infiltration rate.
						6" CS IN										
CB1T2-3	663,221.2809	599,841.8688	5.815	1.9980	2.0814	2.2084		6-Jun-2005	Catch Basin	Brick	Grate	NA	0.8314			4' dia. Excavated and brought to grade.
				14" WOOD IN	14" WOOD OUT	10" WOOD IN		7-Jun-2005								
CB1T2L1-1									Catch Basin	Brick	Grate	NA				4' dia. Excavated and brought to grade.
					6" CS IN	6" CS IN	10" WOOD OUT	7-Jun-2005								
CB1T2-4	663,279.6012	599,810.2836	5.819						Catch Basin	Brick	Grate	NA				4' dia. Excavated and brought to grade.
				12" WOOD in	14" WOOD OUT			8-Jun-2005								Structures beyond this are to be abandoned in place.
				8" CLAY IN												All inlets to be sealed.
CB1T2L2-1 ABANDONED	663,358.4439	599,795.7578	7.2339						Catch Basin	Concrete Block	Open	2-Jun-2005				
SEWER MAIN #1 TRUNK #3																
EAST MH1T3-1	663,022.6782	599,998.3474	8.6254	24" CI OUT			UNDERFLOW IN	21-Apr-2005	Catch Basin	Concrete	Grate	06 April, 2005	1.625	Full		Existing structure unearthed and brought to grade. 6' x 6' with underflow wall baffle, outlet valved.
WEST					24" CI IN	UNDERFLOW OUT	TOP ENTRANCE NEW 6" DI IN	26-Apr-2005	Catch Basin	Concrete	Solid		-7.000	Full		New 6" CS top pipe entrance for soil storage area; valved.
					4" CS SEALED											4" CI from demolished air blower building.
CB1T3L3-1 NEW	663,007.9380	599,980.1990	9.5166				6" DI OUT	NEW	Catch Basin	Concrete	Grate	NA	7.519	NA		NEW 2' x 2' Precast concrete To drain soil staging area with post indicator valve.
EAST CB1T3-2	662,855.1392	600,030.0578	9.3896	24" CI OUT			UNDERFLOW IN	19-Apr-2005	Catch Basin	Concrete	Solid	NA	3.0898	Full		Existing structure unearthed and brought to grade. 8' x 4' with underflow wall baffle. 6" CS Pipe passes through walls; source unknown, not leaking.
								21-Apr-2005								12" CI from demolished tank #4, cut & sealed 04/13/2005.
WEST					12" CI SEALED	UNDERFLOW OUT	24" DI IN	26-Apr-2005	Catch Basin	Concrete	Solid	NA	-6.3000	Full		
EAST MH1T3-3	662,930.6192	599,985.7966	8.4676			24" CI OUT	UNDERFLOW IN	21-Apr-2005	Catch Basin	Concrete	Grate	NA	2.9876	Full		Existing structure unearthed and brought to grade. 6' x 6' with underflow wall baffle.
																20" CI from demolished tanks #1, #2 & #7 cut & sealed 04/14/2005.
WEST	662,928.8637	599,981.9063	8.2838			UNDERFLOW		26-Apr-2005	Catch Basin	Concrete	Grate	NA	2.784	Full		12" CI from demolished tank #3 cut & sealed on 4/13/05.
				20" CI SEALED	24" CI IN	OUT	12" CI SEALED									

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CHECKED BY _____ DATE _____

Structure	NJ Coordinates NAD 83		Elevations in feet NAD 83					Inspection	Structure				Depth			Comments & General Condition
No.	North	East	Rim	North	South	East	West	Date	Type	Construction	Cover	Sampled	Bottom	Silt	Water	
																Existing structure unearthed and brought to grade.
NORTH					UNDERFLOW				Catch Basin	Concrete	Solid	NA		Full		8' x 6' with underflow wall baffle.
MH1T3-4				24" CI OUT	IN			20-Apr-2005								
					ON TOP			21-Apr-2005								12" CI east from demolished tank #6, cut & sealed 04/14/2005.
SOUTH	662,845.1131	600,028.3113	8.3014		8" CS IN	20" CI IN	12" CI IN	28-Apr-2005	Catch Basin	Concrete	Grate	NA		Full		12" CI west from demolished tank #5, cut & sealed 04/14/2005.
					12" CI SEALED	12" CI SEALED	12" CI SEALED									12" CI south from demolished tank #9, cut & sealed 04/14/2005.
CB1T3L2-1	662,828.5106	600,080.1888	8.8041					NEW					6.804	NA		NEW 2' x 2' Precast concrete
NEW				20 CI OUT					Catch Basin	Concrete	Grate	NA				To replace demolished sewer system now under tank #1700
CB1T3L1-1	662,769.3874	################	10.3203					28-Apr-2005					8.220	0		3.5" x 3'
				8" CS OUT	8" CS IN	4" CS IN		7-Jul-2005	Catch Basin	Concrete	Solid	NA				4" Tank #1700 water drawoff.
CB1T3L1-2	662,709.8290	600,052.5904	9.9995	8.9995	9.2495		9.2495	28-Apr-2005					8.300	0		2.5" x 3'
				8" CS OUT	8" CS IN		6" CS IN	28-Feb-2005	Catch Basin	Concrete	Grate	NA				6" west services pump pad.
								7-Jul-2005								6" south Tank 1700 steam condensate
CB1T3L1-PP	662,685.5133	600,048.1894	10.1451					28-Apr-2005	Pump Pad	Concrete	Open	NA		0		Concrete containment pad with berm for pumps
						4" CS OUT		28-Feb-2005								
CB1T3L1-3				-1.0000				28-Apr-2005	Sump	Cement Block	Open	NA	-1.3000	0		Steam condensate sump for tank #1700
				6" CS OUT												
MH1T3-5	662,795.4688	599,988.7847	9.8942					21-Apr-2005	Catch Basin	Concrete	Solid	NA				8' x 6' existing structure unearthed and brought to grade.
					12" CI SEALED	12" CI OUT	12" CI SEALED	28-Apr-2005								12" CI west from demolished tanks #1062, #1064 & 1067, sealed 4/26/05
						4" CI SEALED										4" CI from unknown sealed 4/28/05
																12" CI south sealed 4/28/05
	SEWER MAIN #2															
CB2-1B	663,404.1041	600,480.2871	10.482						Catach Basin	Raised Concrete	Grate					
CB2-1A	663,418.6541	600,366.4405	11.029						Catach Basin	Raised Concrete	Open					
MH2-1	663,427.5358	600,279.3457	9.882						Man Hole	Raised Concrete Block	Open					
MH2-2	663,425.2140	600,280.6180	9.785						Man Hole	Raised Concrete Block	Open					
CB2-3	663,624.3710	600,228.9000	18.247						Man Hole	Raised Concrete	Open					
CB2-4	663,633.9040	600,171.9740	10.6800					25-Feb-2004	Man Hole	Concrete	Solid			3.6800	6.6800	Free floating product
												25-Feb-2004				
CB2-5	663,655.5080	599,984.0880	9.5540					25-Feb-2004	Catch Basin	Concrete	Grate			1.5540	7.0540	Sheen
												25-Feb-2004				
CB2-6	663,778.7240	599,996.9190	10.226	24" WOOD IN		36" WOOD OUT		12-Oct-2004	Catch Basin	Concrete	Grate					
CB2-7	663,924.0770	600,011.0920	9.4200					25-Feb-2004	Catch Basin	Concrete	Grate			1.4200	5.9200	
												25-Feb-2004				
CB2-8	663,908.2160	599,955.0210	9.966						Catch Basin	Concrete	Grate					
	SEWER MAIN #3															
South	663,298.2560	599,931.7740	7.2130					16-Sep-2005	Man Hole	Concrete	Solid					
MH3-1																
North	663,300.2780	599,929.1020	7.3480					22-Sep-2004	Man Hole	Concrete	Solid	18-Aug-2004				

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CALCULATED BY BTT DATE 30-Sep-2005
CHECKED BY _____ DATE _____

Structure	NJ Coordinates NAD 83		Elevations in feet NAD 83					Inspection	Structure				Depth			Comments & General Condition
No.	North	East	Rim	North	South	East	West	Date	Type	Construction	Cover	Sampled	Bottom	Silt	Water	
CB3L1A-1	663,348.5311	599,885.4323	5.0413						Catch Basin	Concrete Block	Open					
CB3L1A-2	663,411.1871	599,850.0674	5.4423						Catch Basin	Concrete	Grate					Excavated and brought to grade.
MH3-1A	663,334.2407	599,807.0770	10.6800					16-Sep-2004 27-Sep-2004	Man Hole	Concrete	Solid					Buried; cover raised to grade, pipe running through manhole repaired.
MH3-1B	663,443.2190	599,847.0431	10.5034					22-Sep-2004	Man Hole	Concrete	Solid					Buried; cover raised to grade, pipe running through manhole repaired.
South MH3-2	663,517.0900	599,806.4360	9.0330					22-Sep-2004	Man Hole	Concrete	Solid	18-Aug-2004				
North	663,520.2170	599,804.6900	9.0810					14-Sep-2004	Man Hole	Concrete	Solid					
CB3-3	663,610.8970	599,744.4150	6.8220	7.6553 4" CS IN	3.1970 15" RCP OUT		3.2803 15" RCP IN 5.7803 8" CLAY IN	5-Apr-2005 6-Apr-2005 14-Apr-2005	Catch Basin	Concrete	Grate		2.1220			4' DIA. 4" CS in is valved area surface drain.
MH3-3A	663,842.5598	599,525.2232	8.2200			3.6367 15" RCP OUT	3.6367 15" RCP IN	5-Apr-2005 6-Apr-2005 14-Apr-2005	Catch Basin	Concrete	Grate	NA	2.5200			4' Dia., excavated and brought to grade. Solid bolted cover replaced with grate.
CB3-3B	663,664.2836	599,320.7338	9.5532	3.7199 15" RCP IN		3.7199 15" RCP OUT		6-Apr-2005 14-Apr-2005	Catch Basin	Concrete	Grate	NA	2.7532			4' Dia., excavated and brought to grade.
CB3-4	663,741.9383	599,283.1675	8.6689		3.9189 15" RCP OUT	8.5002 3" CS IN	4.2502 15" RCP IN	14-Apr-2005 26-May-2005 31-May-2005	Catch Basin	Concrete	Grate	19-Nov-2004	2.9689	6.0502	7.3836	4' DIA.
CB3-5	663,728.9870 663,727.2780	599,197.7406 599,201.1104	11.2219 WEST 11.1295 EAST			9.0462 15" RCP OUT	9.1386 15" RCP IN	26-May-2005 31-May-2005 18-Apr-2005	Catch Basin	Concrete	Solid	NA	8.1757			6' X 4' Excavated for inspection, then reburied. 36" RCP salt water line is imbedded in top.
CB3-6	663,696.7596	599,045.8586	9.6139	5.5308 12" RCP IN		12" RCP OUT	12" RCP IN	28-Apr-2005 29-Apr-2005 31-May-2005	Catch Basin	Concrete	Solid		4.6139			
CB3-7	663,642.1433	599,000.9898	- 9.6874			5.1141 12" RCP OUT	5.1974 12" RCP IN	29-Apr-2005	Catch Basin	Concrete	Grate	19-Nov-2004	4.4474	5.4891	7.3432	4' X 4' 8 CS pipe ruunning through.
CB3-8	663,602.3018	598,966.2445	9.4958			12" RCP OUT	12" RCP IN	24-May-2005 29-May-2005	Catch Basin	Concrete	Grate		4.9958			4' dia.
CB3-9	663,552.4840	598,781.3372	9.0270	6.8603 8" CLAY IN	4.7770 12" RCP IN	12" RCP OUT	4.4437 12" DI IN	24-May-2005 25-May-2005	Catch Basin	Concrete	Grate	19-Nov-2004	3.8270	4.8603	7.3803	
CB3L1-1	598,773.2049	663,624.3277							Catch Basin	Concrete	Grate					UNABLE TO LOCATE
MH3L2-1	663,406.9973	598,762.4150	7.9698		5.3865 12" RCP OUT				Catch Basin	Concrete	Grate		4.7698			4' DIA.
CB3-10	663,535.6428	598,709.1756	9.5738	5.2819 8" DI IN		8.0736 12" DI OUT	5.0736 12" DI IN	24-May-2005 25-May-2005	Catch Basin	Concrete	Grate		4.8736			4' DIA.
CB3L3-1	663,571.1916	598,702.8271	8.5929		5.3429 8" DI OUT				Catch Basin	Concrete	Grate		5.0929			2' X 2'
CB3-11	663,518.7796	598,629.6992	9.1381	12" DI IN		12" DI OUT		24-May-2005	Catch Basin	Concrete	Solid		8.1381			4' DIA.

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Structure No.	NJ Coordinates NAD 83 North	NJ Coordinates NAD 83 East	Elevations in feet NAD 83 Rim	Elevations in feet NAD 83 North	Elevations in feet NAD 83 South	Elevations in feet NAD 83 East	Elevations in feet NAD 83 West	Inspection Date	Structure Type	Structure Construction	Structure Cover	Structure Sampled	Depth Bottom	Depth Silt	Depth Water	Comments & General Condition
CB3-12	663,658.7843	598,591.7260	8.1782		5.4282 12" DI OUT		6.0115 8" DI IN	24-May-2005 25-May-2005	Catch Basin	Concrete	Grate		5.1782			2' X 2' 4" FORCED MAIN ENTERS TOP FROM LS3-13
CB3L4-1	663,651.3375	598,570.9138	8.9735	6.9735 4" DI IN		6.8902 8" DI OUT		25-May-2005	Catch Basin	Concrete	Grate		6.6735			2' X 2'
CB3L4-2	663,583.8017	598,563.0039	8.3981						Catch Basin	Concrete	Grate					
LS3-13	663,990.2345	598,358.5243	13.3972						Lift Station	Concrete	Solid					
CB3-14	664,017.0000	598,361.7000	9.1700	4.6867 12" RCP IN	4.7117 8" DI OUT			25-May-2005	Catch Basin	Concrete	Raised Open	19-Nov-2004	1.7700	3.1700	7.1700	8' X 12'
CB3-15	664,077.8454	598,548.7903	9.2279		5.5812 8" DI IN		5.1448 12" RCP OUT	25-May-2005	Catch Basin	Concrete	Raised Open		4.9279			87" X 54" CONTAINS DIKE VALVE ON INLET
CB3-16	664,060.5752	598,560.7847	8.0704						Catch Basin	Concrete	Grate					
CB3-17	663,978.8865	598,624.1104	7.8359						Catch Basin	Concrete	Grate					
SEWER MAIN #3 TRUNK #1																
MH3T1-1	664,017.2800	598,817.0210	6.5300		12" RCP OUT		12" CI IN	18-Apr-2005 28-Apr-2005	Man Hole	Concrete	Solid	19-Nov-2004	0.4883	1.5717	4.1550	4' X 4' Inlet has a block gate valve followed by a block butterfly valve.
MH3T1-2	663,951.9117	598,899.0316	13.3964						Man Hole	Raised Concrete	Open					
ABANDONED IN PLACE																
CB3T1L1-1	663,983.5126	598,870.1045	8.4172						Catch Basin	Concrete	Grate					
ABANDONED IN PLACE																
CB3T1-3	663,945.8375	598,667.0402	8.4116						Catch Basin	Concrete	Grate					
ABANDONED IN PLACE																
SEWER MAIN #3 TRUNK #2																
MH3T2-1 NEW	663,920.0157	598,383.7387	9.9138						Man Hole	Concrete	Solid					
CB3T2L1-1 NEW	663,913.3887	598,373.1673	9.3958						Man Hole	Concrete	Solid					
CB3T2L2-1 NEW	663,924.8310	598,393.1530	8.8808						Catch Basin	Concrete	Grate					
MH3T2-2 NEW	663,979.0831	598,275.6965	9.8738						Man Hole	Concrete	Solid					
CB3T2L3-1 NEW	663,840.8697	598,405.9218	8.1192						Catch Basin	Concrete	Grate					
CB3T2L4-1 NEW	663,853.2075	598,431.3389	8.7855						Catch Basin	Concrete	Grate					
MH3T2-3 NEW	663,781.8316	598,459.8706	10.2722						Man Hole	Concrete	Solid					

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Structure	NJ Coordinates NAD 83		Elevations in feet NAD 83					Inspection	Structure				Depth			Comments & General Condition
No.	North	East	Rim	North	South	East	West	Date	Type	Construction	Cover	Sampled	Bottom	Silt	Water	
CB3T2L5-1 NEW	663,776.9193	598,444.4502	8.5214						Catch Basin	Concrete	Grate					
CB3T2L6-1 NEW	663,786.6398	598,468.0989	8.9573						Catch Basin	Concrete	Grate					
NEW																
MH3T2-4 NEW	663,709.7722	598,496.0480	9.7520						Man Hole	Concrete	Solid					
CB3T2L7-1 NEW	663,702.5432	598,485.6771	7.985						Catch Basin	Concrete	Grate					
CB3T2L8-1 NEW	663,716.4926	598,507.0988	9.1071						Catch Basin	Concrete	Grate					
SEWER MAIN #3 TRUNK #3																
CB3T3-1 NEW	663,923.3766	598,387.3320	9.7825						Catch Basin	Concrete	Solid					
CB3T3L1-1 NEW	663,892.2881	598,329.0996	8.6850						Catch Basin	Concrete	Grate					
CB3T3L1-2 NEW	663,870.4472	598,310.0191	9.8208						Catch Basin	Concrete	Grate					
CB3T3L1-3 NEW									Catch Basin	Concrete	Grate					
CB3T3-2 NEW	663,979.0931	598,275.6965	9.6738						Catch Basin	Concrete	Grate					
CB3T3-3 NEW	663,959.8500	598,168.3500	10.0700						Catch Basin	Concrete	Grate					
CB3T3-4 NEW	663,882.5200	598,140.2600	10.3300						Catch Basin	Concrete	Grate					
CB3T3-5 NEW	663,819.4980	598,178.6308	10.4000						Catch Basin	Concrete	Grate	19-Nov-2004	7.4000	8.2750	9.6917	
CB3T3L2-1	598,228.1488	663,831.5898							Catch Basin	Concrete	Grate					
CB3T3-6	598,202.1798	663,780.2961							Catch Basin	Concrete	Grate					
CB3T3-7	663,700.6586	598,274.7899	9.5318						Catch Basin	Concrete	Grate	19-Nov-2004	7.2818	7.6985	FLOODED	
CB3T3L3-1	663,651.7849	598,227.0342	10.3541						Catch Basin	Concrete	Grate					
CB3T3L3-2									Catch Basin	Concrete	Grate					
CB3T3L4-1	663,675.8718	598,283.4622	9.4523						Catch Basin	Concrete	Grate					
CB3T3L4-2	663,657.7004	598,283.9748	9.2080						Catch Basin	Concrete	Grate					

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	North	East	Rim	North	South	East	West		Type	Construction	Cover	Sampled	Bottom	Silt	Water	
CB3T3-8	663,889.5220	598,304.6309	9.2559						Catch Basin	Concrete	Grate					
CB3T3-9	663,843.0535	598,326.3001	9.4139						Catch Basin	Concrete	Grate					
	SEWER MAIN #4															
CB4-1	663,708.9705	600,177.3044	10.7530						Catch Basin	Concrete	Solid					
CB4-2									Catch Basin	Concrete	Solid					
CB4-2A																
CB4-2B																
CB4-3	663,720.1561	600,767.1011	7.8237						Catch Basin	Raised Concrete	Open	Multiple	Corral			
CB4-4	663,859.4668	600,778.8105	13.7874						Catch Basin	Concrete	Solid					
CB4-5	663,849.0030	600,880.3195	13.6744													
CB4L1-1	663,786.5362	600,870.8977	11.0581													
CB4l1-2	663,733.2937	600,865.0589	11.2660													
CB4-6																
CB4-7																
CB4-8	663,861.3076	600,986.9795	18.5112													
CB4-9	664,051.5960	601,083.7480	14.8840						Catch Basin	Concrete						
CB4-9A																
CB4-10	664,132.5570	601,191.4780	14.2220						Catch Basin	Concrete						
CB4-10A																
CB4-11																
CB4-12																

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	North	East	Rim	North	South	East	West		Type	Construction	Cover	Sampled	Bottom	Silt	Water	
CB4L2-1	664,322.6790	601,410.8100	16.1630						Catch Basin	Concrete	Grate					
CB4-13																
CB4L3-1																
CB4-14																
CB4L4-1	664,782.4381	601,451.6268	31.1039						Catch Basin	Concrete	Grate					
CB4-15	664,654.6945	601,488.1668	32.6855						Catch Basin	Concrete						
SEWER MAIN #4 TRUNK #1																
MH4T1-1	663,829.1850	600,187.8390	10.3920						Man Hole	Concrete	Solid					
CB4T1L1-1	663,838.1282	600,112.0001	10.6800						Catch Basin	Concrete	Grate					
CB4T1-2	663,939.5019	600,254.9168	11.1795													
MH4T1-3																
CB4T1-4	663,903.6500	600,437.9801	12.6894						Catch Basin	Concrete	Grate					
CB4T1L2-1	663,946.5546	600,426.0842	13.8000						Catch Basin	Concrete	Grate					
MH4T1-5	663,840.7111	600,450.2463	12.8031						Catch Basin	Concrete	Open					
CB4T1-6	663,795.3587	600,445.8787	11.6857						Catch Basin	Concrete	Grate					
SEWER MAIN #4 TRUNK #2																
CB4T2-1	664,351.4941	601,114.0414	25.2336						Catch Basin	Concrete	Grate					
CB4T2-2	664,377.8119	601,003.4937	23.3909						Catch Basin	Concrete	Grate					
CB4T2L1-1	664,389.8889	600,934.4071	24.8940						Catch Basin	Concrete	Grate					
CB4T2-3	664,448.9303	601,009.2841	22.8343						Catch Basin	Concrete	Grate					
CB4T2L2-1	664,444.4793	601,064.8525	22.8684						Catch Basin	Concrete	Grate					

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Structure No.	NJ Coordinates NAD 83 North	NJ Coordinates NAD 83 East	Elevations in feet NAD 83 Rim	North	South	East	West	Inspection Date	Structure Type	Structure Construction	Structure Cover	Structure Sampled	Depth Bottom	Depth Silt	Depth Water	Comments & General Condition
CB4T2L3-1	664,456.2398	600,944.8570	25.9211						Catch Basin	Concrete	Grate					
CB4T2-4	664,521.8748	601,015.6046	22.4499						Catch Basin	Concrete	Grate					
CB4T2L4-1	664,515.8720	601,074.9511	23.0871						Catch Basin	Concrete	Grate					
CB4T2L5-1	664,527.7448	600,949.5673	26.5422						Catch Basin	Concrete	Grate					
CB4T2-5	664,585.8354	601,023.3669	23.7887						Catch Basin	Concrete	Grate					
SEWER MAIN #4 TRUNK #3																
CB4T3L1-1	664,188.6290	601,209.4720	14.5870						Catch Basin	Concrete	Grate					
CB4T3-1																
CB4T3-2																
CB4T3L2-1	664,347.7125	601,177.3788	15.5273						Catch Basin	Concrete	Grate					
CB4T3-3																
CB4T3L3-1																
CB4T3-4																
CB4T3-5																
SEWER MAIN #5																
LS5-1	663,541.9620	599,776.8580	9.1620						Lift Station	Concrete	Grate					
CB5-1A	663,578.0000	599,746.6610	8.1400						Catch Basin	Concrete	Grate					
PIPE-U1			11.4000													WHERE FORCED MAIN GOES UNDER GROUND
PIPE -A1																WHERE FORCED MAIN GOES ABOVE GROUND IN BUTANE RAIL YARD
PJ5-2																WHERE FORCED MAIN SPLITS TO PACKARD'S AND YARD#5 POND
LS5-3	665,005.4900	600,043.7160	10.1300						POND	EARTH	OPEN					

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Structure No.	NJ Coordinates NAD 83 North	East	Elevations in feet NAD 83 Rim	North	South	East	West	Inspection Date	Structure Type	Construction	Cover	Sampled	Depth Bottom	Silt	Water	Comments & General Condition
PIPE-U3																
CB5-4	663,888.9187	600,753.7192	13.3874						Catch Basin	Concrete	Grate					
CB5L1-1	663,899.7270	600,710.0949	14.7519						Catch Basin	Concrete	Grate					
CB5L2-1																
SEWER MAIN #5 TRUNK #1																
PIPE-U2			11.4000													WHERE FORCED MAIN GOES UNDER GROUND
PIPE -A2																WHERE FORCED MAIN GOES ABOVE GROUND
LS5T1-1	666,134.8354	600,261.9044	7.9007						Lift Station	Concrete	Grate					
CB5T1-2	666,265.3942	600,322.8563	3.3910						Catch Basin	Concrete	Grate					
CB5T1-3	666,388.3601	600,355.4045	3.5137						Catch Basin	Concrete	Grate					
CB5T1-4	666,492.2272	600,389.6971	3.6493						Catch Basin	Concrete	Grate					
SEWER MAIN #5 TRUNK #2																
CB5T2-1	666,026.3277	600,245.1902	3.6321						Catch Basin	Concrete	Grate					
CB5T2-2	665,889.0038	600,196.7096	3.4219						Catch Basin	Concrete	Grate					
SEWER MAIN #5 TRUNK #3																
CB5T3-1	663,970.4289	600,717.1953	13.7354						Catch Basin	Concrete	Grate					
CB5T3-2	663,979.3730	600,652.9103	14.1991						Catch Basin	Concrete	Grate					
CB5T3-3	663,982.3674	600,585.3850	13.5052						Catch Basin	Concrete	Grate					
CB5T3-4	663,921.4196	600,577.5773	13.3472						Catch Basin	Concrete	Grate					
SEWER MAIN #6																
CB6-1	664,473.5460	600,040.2110	18.8970						Catch Basin	Concrete	Open					
CB6-2	664,444.4600	600,388.9380	35.1220						Catch Basin	Concrete	Grate					
CB6-3	664,394.9050	600,559.6680	35.1330						Catch Basin	Concrete	Solid					

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Structure	NJ Coordinates NAD 83		Elevations in feet NAD 83					Inspection	Structure				Depth			Comments & General Condition
No.	North	East	Rim	North	South	East	West	Date	Type	Construction	Cover	Sampled	Bottom	Silt	Water	
CB6L1-1	664,508.7150	600,559.8460	33.1400						Catch Basin	Concrete	Grate					
CB6-4																
CB6-5																
CB6-6	664,413.8030	600,755.8760	30.6550						Catch Basin	Concrete	Grate					
CB6-7	664,413.8430	600,838.8100	30.3910						Catch Basin	Concrete	Grate					
CB6-8	664,556.8960	600,884.6290	31.3080						Catch Basin	Concrete	Grate					
CB6-9	664,570.0410	600,827.7910	31.3830						Catch Basin	Concrete	Grate					
CB6-10	664,620.2530	600,851.2950	31.7870						Catch Basin	Concrete	Grate					
CB6-11	664,620.2530	600,851.2950	31.7870						Catch Basin	Concrete	Grate					
CB6-12																
SEWER MAIN #6 TRUNK#1																
CB6T1-1	664,923.2280	600,189.0500	26.5210						Catch Basin	Concrete	Grate					
CB6T1L1-1	664,346.0660	600,218.7190	25.3330						Catch Basin	Concrete	Grate					
CB6T1-2																
SEWER MAIN #6 TRUNK#2																
CB6T2-1																
CB6T2-2																
CB6T2-3																
SEWER MAIN #6 TRUNK#3																
CB6T3-1																
CB6T3-2																
SEWER MAIN #6 TRUNK#4																
CB6T4-1																

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Structure No.	NJ Coordinates NAD 83		Elevations in feet NAD 83					Inspection Date	Structure				Depth			Comments & General Condition
	North	East	Rim	North	South	East	West		Type	Construction	Cover	Sampled	Bottom	Silt	Water	
CB6T4-2																
SEWER MAIN #6 TRUNK#5																
CB6T6-1																
SEWER MAIN #7																
CB7-1	664,746.6870	600,090.6500	13.1620						Catch Basin	Concrete	Grate					
CB7-2	664,760.4620	600,242.2860	26.8670													
CB7-3	664,595.9270	600,201.6520	27.1500						Catch Basin	Concrete	Grate					
CB7L1-1	664,888.7110	600,297.8210	26.9740													
SEWER MAIN #8																
CB8-A																
CB8-1	665,019.3250	600,458.8917	18.9089						Catch Basin	Concrete	Grate					
CB8-2																
CB8-3																
CB8L1-1	665,088.5520	601,114.0160	35.9170						Catch Basin	Concrete	Open					
CB8-4																
CB8-5																
CB8L2-1																
SEWER MAIN #9																
LS9-1	663,273.8150	600,749.6770	9.2310						Lift Station	Concrete	Solid					
CB9-2	663,195.3280	600,790.3323	8.6053						Catch Basin	Concrete	Grate					
CB9L1-1	663,190.9781	600,819.6013	8.8137						Catch Basin	Concrete	Grate					
CB9-3	663,108.6800	600,796.7099	9.1445						Catch Basin	Concrete	Grate					
CB9-L2-1																

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Structure No.	NJ Coordinates NAD 83 North	NJ Coordinates NAD 83 East	Elevations in feet NAD 83 Rim	Elevations in feet NAD 83 North	Elevations in feet NAD 83 South	Elevations in feet NAD 83 East	Elevations in feet NAD 83 West	Inspection Date	Structure Type	Structure Construction	Structure Cover	Structure Sampled	Depth Bottom	Depth Silt	Depth Water	Comments & General Condition
CB9-4	663,097.7689	600,792.6451	9.9001						Catch Basin	Concrete	Grate					
CB9-5	663,065.2398	600,789.4157	10.0632						Catch Basin	Concrete	Grate					
CB9L3-1	663,039.8425	600,786.3996	9.8262						Catch Basin	Concrete	Grate					
CB9-5A	663,056.8506	600,716.3440	9.4748						Catch Basin	Concrete	Grate					
OB9-6	663,036.0674	600,665.2228	9.0032						Catch Basin	Concrete	Grate					
CB9L4-1	663,007.6808	600,603.4536	8.5801						Catch Basin	Concrete	Grate					
MH9-7	662,873.7067	600,688.9200	10.7878						Man Hole	Concrete	Solid					
CB9-8	662,764.3291	600,717.7918	8.8765						Catch Basin	Concrete	Solid					
LS9-9	662,694.0299	600,679.8484	9.8519						Lift Station	Concrete	Solid					
SEWER MAIN #9 TRUNK #1																
CB9T1-1	663,107.5561	600,840.6560	9.5911						Catch Basin	Concrete	Grate					
CB9T1-2	663,101.8700	600,891.4811	9.3663						Catch Basin	Concrete	Grate					
CB9T1-3	663,099.1622	600,945.9992	9.7920						Catch Basin	Concrete	Grate					
CB9T1-3A	663,043.8442	600,941.8982	9.0537						Catch Basin	Concrete	Solid					
CB9T1-4	663,035.6160	600,990.1007	9.2307						Catch Basin	Concrete	Grate					
CB9T1-5	662,780.0093	600,960.8366	9.0248						Catch Basin	Concrete	Grate					
CB9T1-6	662,789.4630	600,916.5566	9.5396						Catch Basin	Concrete	Solid					
SEWER MAIN #10																
LS10-1	665,056.3770	599,927.4890	8.4420						Lift Station	Concrete	Grate	NA				
CB10-2	664,837.3020	599,841.9410	9.1530						Catch Basin	Concrete	Grate					
CB10-3	664,844.5920	599,946.4050	9.5990						Catch Basin	Concrete	Grate					

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Structure	NJ Coordinates NAD 83		Elevations in feet NAD 83					Inspection	Structure				Depth			Comments & General Condition
No.	North	East	Rim	North	South	East	West	Date	Type	Construction	Cover	Sampled	Bottom	Silt	Water	
CB10-4	664,754.0860	599,952.7490	9.7340						Catch Basin	Concrete	Grate					
CB10-5	664,674.2190	599,959.1720	10.2030						Catch Basin	Concrete	Grate					
CB10L1-1	664,735.5020	599,997.0350	12.5500						Catch Basin	Concrete	Open					Valve drainage from Pond in Yard #5
CB10-6	664,535.7630	599,963.4450	11.3480						Catch Basin	Concrete	Grate					
	SEWER MAIN #11															
				INLET												
LS11-1	662,527.9700	599,789.5570	13.8650	6.7042				2-Aug-2004	Lift Station	Concrete	Solid	NA	4.7050	NA	NA	
NEW																
				INLET	OUTLET	CATCH BASIN										
MH11-2	662,704.7260	599,871.0330	11.2840	7.0290	6.9982	10.3007		3-Aug-2004	Man Hole	Concrete	Solid	NA	5.7790	NA	NA	
NEW																
							OUTLET									
CB11-2E	662,730.2145	599,682.6628	11.3728				10.2907	29-Nov-2004	Catch Basin	Concrete	Grate	NA	8.9890	NA	NA	
NEW																
				INLET	OUTLET	CATCH BASIN										
MH11-3	662,765.8117	599,627.3849	11.3196	7.8348	7.8048	7.9567		16-Nov-2004	Man Hole	Concrete	Solid	NA	8.5850	NA	NA	
NEW																
							OUTLET									
CB11-3E	662,790.6553	599,636.5150	11.3805				9.1133	30-Nov-2004	Catch Basin	Concrete	Grate	NA	8.8050	NA	NA	
NEW																
					OUTLET	CATCH BASIN										
MH11-4	662,824.8844	599,605.7631	11.3268		7.7148	8.9067		17-Nov-2004	Man Hole	Concrete	Solid	NA	7.4750	NA	NA	
NEW																
							OUTLET									
CB11-4E	662,830.4345	599,616.5158	11.3887				10.1887	30-Nov-2004	Catch Basin	Concrete	Grate	NA	8.7550	NA	NA	
NEW																

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BAYONNE, NJ 07002
(201) 437 - 2200

APPENDIX B2
SEWER LINE INSPECTION FORM

PROJECT No. BA - 0507
DESCRIPTION SEWER INSPECTION
CALCULATED BY BTT DATE 30-Sep-2005
CHECKED BY _____ DATE _____

FROM		TO		SEWER PIPE			INSPECTION	COMMENTS & GENERAL CONDITION
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
SEWER MAIN #1								
LS1-1		API Separator		8	215.0	Welded CS Pipe		Forced main to API Separator.
								To be pressure tested.
ELBOW		LS1-1		48	89.3	Gray Cast Iron	5-May-2004	MH1-2 was found not to be a manhole, but, instead
(MH1-2)			-0.7660					a burried 48"/42" miter reducing joint inbedded in
								concrete 98.3 LF upstream from LS1-1.
								All joints were tight.
MH1-3A		ELBOW		42	38.8	Gray Cast Iron	5-May-2004	New Manhole MH1-3A found under RR tracks,
	-0.4667	(MH1-2)						115.8 LF downstream of CB1-4.
								Infiltration drip at 26.4 LF downstream from MH1-3A @ 3 O'Clock
MH1-3								
CB1-3B								SEWER ROUTING UNKNOWN AT THIS TIME.
CB1-3C								
CB1-3D								
CB1-4		MH1-3A		42	115.8	Gray Cast Iron	29-Apr-2004	CB1-4 is concrete brick construction above grade, "Flower Pot".
	0.3124		-0.4667					All joints were tight.
CB1L1A-1		CB1-4		24		Gray Cast Irin		Burried, to be video inspected.
CB1-5		CB1-4		42	152.2	Gray Cast Iron	29-Apr-2004	Infiltration drips @ 12 O'clock &
	1.2000		0.3124					15 LF & 53.2 LF downstream of downstream of CB1-5.
CB1-6		CB1-5		42	112.3	Gray Cast Iron	5-Apr-2004	All joints were tight.
	4.4360		1.4000					
LS1L2-1	N/A	CB1-6	From Above	4	200.0	C.S. Pipe		Above ground forced main, not cleaned not video inspected
								DECOMMISSIONED AUGUST 2005
CB1-7		CB1-6		36	65.4	Gray Cast Iron	6-Apr-2004	All joints were tight.
	3.4400		4.4360					
CB1-8		CB1-7		24	180.1	Gray Cast Iron	15-Mar-2004	All joints were tight.
	4.3343		3.4400					Inspection ends at partition wall in CB1-7
CB1-9		CB1-8		14	60.0	Wood Stave	15-Mar-2004	All joints were tight.
ABANDONED IN PLACE NOVEMBER 2nd, 2004								Inspection ended at partition wall in CB1-8.
	3.6858		3.341					

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FROM		TO		SEWER PIPE			INSPECTION	COMMENTS & GENERAL CONDITION
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
CB1L3-1		CB1-9		10	Est. 45	Gray Cast Iron		Not cleaned or video inspected.
ABANDONED IN PLACE NOVEMBER 2nd, 2004								
CB1-10		CB1-9		14	Est. 72	Wood Stave	10-Mar-2004	Reduced sized valve in line, 19.5 LF downstream from CB1-10,
ABANDONED IN PLACE NOVEMBER 2nd, 2004							11-Mar-2004	camera cannot pass through. Cannot video back from CB1-9
	4.3740		4.4358					because of Cast Iron elbow Fire-stop.
CB1L4-1		CB1-10		12	59.4	Wood Stave	10-Mar-2004	39.9 LF downstream from CB1L4-1 there is a partially closed valve.
ABANDONED IN PLACE NOVEMBER 2nd, 2004							11-Mar-2004	Video inspected from both catch basins to valve.
	6.3353		4.5407					35.2 LF downstream from CB1L4-1 lateral seam is separated
CB1L4-2		CB1L4-1		12	117.1	Wood Stave	9-Mar-2004	74.2 LF downstream of CB1L4-1 there is a leaking offset joint.
ABANDONED IN PLACE NOVEMBER 2nd, 2004								
	-2.5000		7.5020					
CB1L4-3		CB1L4-2		12	Est. 120	Wood Stave	8-Mar-2004	55.8 LF downstream from CB1L4-3 there is a leaking separated joint
ABANDONED IN PLACE NOVEMBER 2nd, 2004								67.6 LF downstream from CB1L4-3 the roof is caved in by conc. Func
	8.0347		-2.5000					80.8 LF downstream from CB1L4-3 pipe is oushed in on west side
								camera cannot pass through.
CB1-11		CB1-10		12	129.0	Wood Stave	5-Mar-2004	37.3 LF to 62 LF downstream of CB1-11 pipe sags
ABANDONED IN PLACE NOVEMBER 2nd, 2004								104.8 LF to 110.4 LF Concrete roof patch
	7.3638		7.1240					Buried CB1-10 encountered at 129-ft.
CB1-12		CB1-11		12	144.4	Wood Stave	3-Mar-2004	24.3 LF to 31 LF downstream of CB1-12 there is a pipe sag.
ABANDONED IN PLACE NOVEMBER 2nd, 2004								61.7 LF downstream of CB1-12
								there is a 3-in hole @ 1 O'clock
	7.7794		7.5304					80.5 LF to 101.5 LF downstream of CB1-12
								there is a pipe sag
								116.2 LF& 136.4 LF downstream of CB1-12
								there are separated joints leaking.
CB1L4-3		CB1-12		12	Est. 60	Wood Stave		Clogged, not video inspected.
ABANDONED IN PLACE NOVEMBER 2nd, 2004								
	9.2847		8.9461					
CB1-13		CB1-12		12	Est. 82	Wood Stave		Clogged, CB1-13 buried, not found, not video inspected.
REMOVED ON OCTOBER 26, 2004								Removed on October 26th as part of new Yard#1 sewer installation.
			7.9461					
MH1L5-1		CB1-12		6	Est. 180	Wood Stave		Burried MH1L5-1, sewer line clogged, never found.
ABANDONED IN PLACE NOVEMBER 2nd, 2004								
MH1-9A	6.3610	CB1-8	3.3410					
NEW YARD#1 SEWER				12	44.5	Ductile Iron	7-Oct-2004	Post Indicator Valve dike drainage block valve & 45° elbow in line

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STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	INSPECTION DATE	COMMENTS & GENERAL CONDITION
CB1-10A	6.3310	MH1-9A	6.2210					
NEW YARD#1 SEWER				12	87.5	Ductile Iron	24-Aug-2004	
CB1-10W	7.0560	CB1-10A	5.4660					
NEW YARD#1 SEWER				8	43.5	Ductile Iron	24-Aug-2004	45° elbow in line
MH1-11A	6.0960	CB1-10A	6.0410					
NEW YARD#1 SEWER				12	102.2	Ductile Iron	14-Sep-2004	
CB1-11W	5.3710	MH1-11A	4.6760					
NEW YARD#1 SEWER				8	29.7	Ductile Iron	16-Sep-2004	
CB1-11E	7.1960	MH1-11A	7.0860					
NEW YARD#1 SEWER				8	19.7	Ductile Iron	16-Sep-2004	
MH1-12A	6.2510	MH1-11A	6.2010					
NEW YARD#1 SEWER				12	136.3	Ductile Iron	22-Sep-2004	
CB1-12W	7.4460	MH1-12A	5.0060					
NEW YARD#1 SEWER				8	31.7	Ductile Iron	23-Sep-2004	
CB1-12E	7.1660	MH1-12A	6.4460					
NEW YARD#1 SEWER				8	24.2	Ductile Iron	23-Sep-2004	90° elbow in line
MH1-13A	6.7910	MH1-12A	6.3210					
NEW YARD#1 SEWER				12	64.7	Ductile Iron	5-Oct-2004	
CB1-13W	6.0660	MH1-13A	4.8060					
NEW YARD#1 SEWER				8	48.8	Ductile Iron	5-Oct-2004	
MH1-14A	11.1040	MH1-13A	6.9010					
NEW YARD#1 SEWER				8	38.4	Ductile Iron	20-Oct-2004	
CB1-14N	8.3160	MH1-14A	8.1660					
NEW YARD#1 SEWER				8	17.2	Ductile Iron	20-Oct-2004	
MH1-15A	7.2260	MH1-14A	6.9360					
NEW YARD#1 SEWER				8	39.8	Ductile Iron	26-Oct-2004	

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STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	INSPECTION DATE	COMMENTS & GENERAL CONDITION
CB1-15S	9.9510	MH1-15A	7.9760					
NEW YARD#1 SEWER				8	18.8	Ductile Iron	26-Oct-2004	
SEWER MAIN #1 TRUNK #1								
								Valve in line.
MH1T1-1		CB1-5	3.1333	16	60.0	Wood Stave	13-Jun-2005	Infiltration seepping 20' @ 4 o'clock
								Pipe broken 23.7' @ 6 o'clock
								Blockage @ 28.1'
MH1T1L1-1		MH1T1-1		10	63.3	Wood Stave	14-Jun-2005	Infiltration seepping 12.3' @ 4 o'clock & 29.2' @ 9 o'clock
								Infiltration dripping joint 27.5' @ 3o'clock.
MH1T1L1-2		MH1T1L1-1		10	33.7	Wood Stave	14-Jun-2005	Pipe broken 21.9' from 3 to 5 o'clock
								Pipe broken 24.1' from 3 to 5 o'clock.
								Infiltration weeping at joints 9.6' @ 3 o'clock; 23.7' @ 4 o'clock;
MH1T1L5-1		MH1T1-1		12	75.0	Wood Stave	14-Jun-2005	51.6' @ 2 o'clock & 58.5' @ 2 o'clock.
								Infiltration dripping at joint 37.3' @ 12 o'clock.
								Separated joint @ 63.4' & sag @ 21.1'.
UNKNOWN		MH1T1L5-1		8	—	Carbon Steel	14-Jun-2005	Hole in pipe 20' from 1 to 7 o'clcok.
								BULK HEADED AT 20.5', LINE ABANDONED.
CB1T1L5-2		MH1T1L5-1		10	38.4	Wood Stave	14-Jun-2005	Infiltration seepping 18.3' @ 8 o'clock.
								Infiltration dripping 19' @ 12 o'clock.
MH1T1L6-1		MH1T1-1		10	—	Wood Stave	14-Jun-2005	**FOUND PIPE BLOCKED & ABANDONED**
								Infiltration seeping at joints 21' @ 12 o'clock; 28' @ 3 o'clock;
MH1T1-2		MH1T1-1		16	117.6	Wood Stave	13-Jun-2005	36.2' @ 8 o'clock; 77' @ 4 o'clck & 103.3' @ 3 o'clock.
								Sag between 50.2' & 73.1'.
								Infiltration seeping 16.7' @ 4 o'clock.
MH1T1-3		MH1T1-2		14	81.9	Wood Stave	16-Jun-2005	Pipe brook between 36.2 & 48.3'; repaired with 12" Ø PVC pipe.
							22-Jun-2005	Infiltration running 59.6' from 4 to 8 o'clock.
								Infiltration dripping 14.3' @ 12 o'clock & 26.7' @ 12 o'clock(deformed)
MH1T1L2-1		MH1T1-3		10	78.4	Wood Stave	27-Jun-2005	Infiltration gushing 38.1' @ 6 o'clock & running 49.8' @ 2 o'clcok.
								Infiltration seeping 42.7' @ 4 o'clock.
MH1T1-4		MH1T1-3		14	80.7	Wood Stave	16-Jun-2005	Infiltration seeping 29.6' @ 4 o'clock & 41.6' @8 o'clock.

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FROM		TO		SEWER PIPE			INSPECTION	COMMENTS & GENERAL CONDITION
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
MH1T1L2A-1		MH1T1-4		10	84.0	Wood Stave	16-Jun-2005	Infiltration seping 38.4' @ 8 o'clcok & 45.9' @ 5 o'clock.
MH1T1-5		MH1T1-4		12	80.5	Wood Stave	16-Jun-2005	Pipe broken 14.7' @ 5 o'clcok. Infiltration dripping 42.3' @ 12 o'clock, 53.8' @ 12 o'clock & 72.5' @ 12 o'clock (seem leaking).
LS1T1L3-1		MH1T1-5		10	29.7	Carbon Steel	22-Jun-2005	
LS1T1L3-1		CB1-6		3	350.0	Carbon Steel		**ABOVE GROUND FORCED MAIN.**
MH1T1-6		MH1T1-5		12	45.0	Wood Stave	21-Jun-2005	Camera could not pass off-set joint at 35.2'.
MH1T1-6A		MH1T1-6		12	64.8	Wood Stave	21-Jun-2005	Infiltration dripping 6.4' @ 2 o'clock & 52.6' @ 12 o'clock.
MH1T1L8-1		MH1T1-6A						**NEVER FOUND**
MH1T1-7		MH1T1-6A		12	21.5	Wood Stave	23-Jun-2005	Infiltration dripping at joint 12' @ 12 o'clock.
MH1T1L4-1		MH1T1-7		10	72.6	Wood Stave	23-Jun-2005 28-Jun-2005	Infiltration seeping at joint 51.1 @ 2 o'clock. Infiltration dripping 32.8' @ 12 o'clock & 54.3 @ 2 o'clock. Infiltration running 15.7' @ 3 o'clock, 36.3' @ 2 o'clock & 62.4' @ 4 o'clock (joint). Pipe deformed 32.8' & 51.4'.
LS1T1L7-1		MH1T1-7		3	430.0	Carbon Steel		**ABOVE GROUND FORCED MAIN.**
MH1T1-7A		MH1T1-7		12	28.1	Wood Stave	27-Jun-2005	Infiltration running 18.5' (joint) @ 9 o'clock & 18.7' @ 12 o'clock.
MH1T1-8		MH1T1-7A		12	75.0	Wood Stave	27-Jun-2005	**PIPE COLLAPSED 6.5' IN FROM MH1T1-7A.** **TO BE SEALED & ABANDONED.**

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SEWER MAIN #1 TRUNK #2								
CB1T2-1A		CB1-6		16	51.2	Wood Stave	29-Jun-2005	31.7' to 34.3' steel gate valve.
								Infiltration seeeping 14.6" @ 03 o'clock, 23.6' @ 03 o'clock.
								Infiltration dripping 43.2' @ 12 o'clcok 51.2' @ 12 o'clock.
								Elbow at 51.2' stops inspection.
								Elbow at 51.2' camera cannotpass.
CB1T2-1		CB1T2-1A		14	34.2	Wood Stave	8-Jun-2005	23.1' @ 11 o'clock infiltration seeping.
CB1T2-2		CB1T2-1		14	68.2	Wood Stave	6-Jun-2005	25.1 @ 12 o'clock & 50.7' @ 01 o'clck infiltration dripping.
CB1T2-3		CB1T2-2		14	67.2	Wood Stave	6-Jun-2005	
CB1T2L1-1		CB1T2-3		10	63.8	Wood Stave	7-Jun-2005	61.8' @ 02 o'clock infiltration dripping.
								35' offset joint.
CB1T2-4		CB1T2-3		14	66.5	Wood Stave	6-Jun-2005	41.2' pipe deformed.
								44.4' @ 11 o'clock& 53.3' @ 12 to 3 o'clock infiltration dripping.
SEWER MAIN #1 TRUNK #3								
MH1T3-1		CB1-7		24	73.5	Cast Iron	18-Apr-2005	Valve to be replaced and "P" tray removed.
EAST								
NEW								Installed on 5/02/05
CB1T3L3-1		MH1T3-1		6		Ductile Iron	NA	Block valve for soil staging area.
		WEST						
MH1T3-2		MH1T3-1		24	70.6	Cast Iron	21-Apr-2005	Leaky joint at 39.5' repaired on 4/26/05 with hydraulic cement.
EAST		WEST					26-Apr-2005	
MH1T3-3		MH1T3-2		24	47.4	Cast Iron	19-Apr-2005	
EAST		WEST						
MHIT3-4		MH1T3-3		24	93.5	Cast Iron	20-Apr-2005	
NORTH		WEST						

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NEW								Installed on 4/27/05
CB1T3L2-1		MH1T3-4		20	55.5	Cast Iron	21-Apr-2005	Valve removed and NEW catch basin installed.
		SOUTH						Serice connection at 26.4', source unknown.
CB1T3L1-1		MH1T3-4		8	80.0	Cast Iron	26-Apr-2005	
		SOUTH						
CB1T3L1-2		CB1T3L1-1		8	63.1	Cast Iron	26-Apr-2005	Offset over sized union at 32.7' repaired with hydraulic cement 4/28/0
							7-Jul-2005	
CB1T3L1-PP		CB1T3-2		4		Carbon Steel		
CB1T3L1-3		CB1T3L1-2		8	34.0	Carbon Steel	28-Apr-2005	
MH1T3-5		MH1T3-4		12"	70.0	Cast Iron	21-Apr-2005	
SEWER MAIN #2								
MH2-1B		LS1-1		36	30	Wood Stave		
MH2-1A		MH2-1B		36	90	Wood Stave		
MH2-1		MH2-1A		36	120	Wood Stave		
MH2-2		MH2-1		36	24	Wood Stave		
MH2-3		MH2-2		36	55	Wood Stave		
CB2-4		MH2-3		36	246	Wood Stave		

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CB2-5		CB2-4		36	162	Wood Stave		
CB2-6		CB2-5		24	120	Wood Stave		
CB2-6A		CB2-6		24	95	Wood Stave		
CB2-7		CB2-6A		24	50	Carbon Steel		
CB2-8		CB2-7		4	60	Carbon Steel		Trough drain by lab building.
UNKNOWN		CB2-8						
SEWER MAIN #3								
								Pipe size increases from 24" to 30" 50' upstream of CB1-6.
MH3-1		CB1-6		30 & 24	169.1	Gray Cast Iron	22-Oct-2004	Four unknown service connections in roof.
South								at 50', 71.5', 75.1' & 113' upstream of CB1-6
								All joints are tight.
								Clogged, & valved.
CB3L1A-1		MH3-1		24	Est. 70	Gray Cast Iron		To be cleaned, video inspected and put back in service
		North						
MH3-1A		MH3-1		30	39.1	Gray Cast Iron	16-Sep-2004	All joints are tight
		North						
							16-Sep-2004	Pipe size increases from 24" to 30" 122' upstream of MH3-1A.
MH3-1B		MH3-1A		30 & 24	126.6	Gray Cast Iron	27-Sep-2004	Patch repair to roof at 162.7' upstream of MH3-1A.
								All joints are tight.
								Pipe size increases from 24" to 30" 30.8' upstream of MH3-1B.
MH3-2		MH3-1B		30 & 24	82.0	Gray Cast Iron	22-Sep-2004	Patch repair to roof at 45.4' upstream of MH3-1B.
South								All joints are tight.
							12-Sep-2004	Video Inspected from MH3-2 to Elbow; 9 feet.
Excavation		MH3-2		15	Est. 100	Gray Cast Iron	14-Sep-2004	Video Inspected from excavation to valve; 75.4 feet.
		North						Unknown service connection & severe pitting in bottom.

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								Patch repair to roof at 98.1' upstream of MH3-2.
CB3-3	3.197	MH3-2		15	110.0	Gray Cast Iron	14-Sep-2004	All joints are tight.
		North						
							5-Apr-2005	STEAM PIPE THROUGH ROOF @ 18.6'.
CB3-3A		CB3-3	3.2803	15	217.5	RCP	6-Apr-2005	REMOVED AND HOLE REPAIRED ON 12 APRIL, 2005.
							14-Apr-2005	Longitudinal crack @ 33.9' 09 o'clock.
								Spot repair @ 207.7' 10 to 02 o'clock.
CB3-3B		CB3-3A		15	203.4	RCP	6-Apr-2005	
								Spot repair @ 21.4' 12 o'clock & 55.1'.
CB3-4	3.9169	CB3-3B		15	71.1	RCP	14-Apr-2005	30.6' reduced pipe size bloked camer
							31-May-2005	Circumferential crack @ 63'.
								STEAM PIPE OBSTRUCTION @ 63.4'.
CB3-5	9.0462	CB3-4	4.2502	15	83.4	RCP	26-May-2005	Offset joint @ 8.8'.
								Circumferential crack @ 23.8' 02 to 04 o'clock.
								STEAM PIPE THROUGH ROOF @ 93.7'.
CB3-6		CB3-5	9.1386	15	150.0	RCP	18-Apr-2005	REMOVED AND HOLE REPAIRED ON 31 MAY, 2005.
							31-May-2005	Hanging Gasket @ 9.9'.
								Exposed gaskets @ 18.2' & 103.2'.
								Multiply cracks @ 17.8', 24.8' & 32.2'
CB3-7	5.1141	CB3-6	5.5306	12	70.0	RCP	29-Apr-2005	Exposed gasket @ 8.8'.
								Sag @ 21.5'
CB3-8		CB3-7	5.1974	12	50.6	RCP	29-Apr-2005	
								Sever pitting @ 11.5" 12 o'clock.
CB3-9		CB3-8		12	183.6	RCP	24-May-2005	Circumferential cracks @ 47.9' & 84.3'.
								Gasket exposed @ 54'.
								Separated joints @ 150.8' & 175.3'.
								CB3L1-1 NEVER LOCATED. CAMERA BLOCKED @ 58.1'
CB3L1-1		CB3-9	6.8603	8	58.1	Clay	24-May-2005	UNKNOWN SERVICE ENTRANCE
								Multiple cracks @ 18.9', 27.8' & 40.2'.
								Spot repair @ 20.1'.
								Material changes to steel @ 18.3'
MH3L2-1	5.3865	CB3-9	4.7770	12	147	RCP	24-May-2005	Exposed gaskets @ 85.5' & 120.2'.
							25-May-2005	Valve @ 105.3'.

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DESCRIPTION SEWER INSPECTION
CALCULATED BY BTT DATE 30-Sep-2005
CHECKED BY _____ DATE _____

FROM		TO		SEWER PIPE			INSPECTION	COMMENTS & GENERAL CONDITION
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
CB3-10	5.0736	CB3-9	4.4437	12	84.0	Ductile Iron	24-May-2005	
CB3L3-1	5.3429	CB3-10	5.2819	8	37.8	Ductile Iron	25-May-2005	
CB3-11		CB3-10	5.0736	12	80.0	Ductile Iron	24-May-2005	Circumferential cracks @ 38.3' & 43.8'.
CB3-12	5.4282	CB3-11		12	56.0	Ductile Iron	24-May-2005	Elbow @ 53.7'.
CB3L4-1	6.8902	CB3-12	6.0115	8	23.4	Ductile Iron	25-May-2005	
CB3L4-2		CB3L4-1	6.9735		60	Gray Cast Iron		
LS3-13		CB3-12		4	500.0	C. S. Pipe		FORCED MAIN
CB3-14	4.7117	LS3-13		8	36.0	Ductile Iron		
CB3-15	5.1446	CB3-14	4.5867	12	177.0	RCP	25-May-2005	Circumferential cracks @ 8.5', 46.3', 52.9, 61.7' & 131.2'. Longitudinal crack @ 44.4' 09 o'clock. Pipebroke at joint @ 140.5' 02 o'cllock. Gasket exposed @ 168.2'. Weeping joint @ 158.4' 11 to 12 o'clock.
NEW CB3-16		CB3-15	5.5612	8	25.0	Ductile Iron		VALVE.
NEW CB3-17		CB3-16		8	105.0	Ductile Iron		
SEWER MAIN #3 TRUNK #1								
MH3T1-1		CB3-6		12	385.1	RCP	28-Apr-2005	Circumferential cracks 49.7', 98.3', 111.2' & 148.2'. Exposed gasket 202.6'. spot repair 98.5'.

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DESCRIPTION SEWER INSPECTION
CALCULATED BY BTT DATE 30-Sep-2005
CHECKED BY _____ DATE _____

FROM		TO		SEWER PIPE				
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	INSPECTION DATE	COMMENTS & GENERAL CONDITION
MH3T1-2		MH3T1-1			135.0			GATE & BUTTERFLY VALVE.
ABANDONED								REPLACED BY NEW SEWER
CB3T1L1-1		MH3T1-2			45.0			GATE VALVE
ABANDONED								REPLACED BY NEW SEWER
CB3T1-3		MH3T1-2			35.0			REPLACED BY NEW SEWER
ABANDONED								
SEWER MAIN #3 TRUNK #2								
MH3T2-1		LS3-15		8	80	Ductile Iron		
CB3T2L1-1		MH3T2-1		8	10	Ductile Iron		
CB3T2L2-1		MH3T2-1		8	10	Ductile Iron		
MH3T2-2		MH3T2-1		8	75	Ductile Iron		
CB3T2L3-1		MH3T2-2		8	10	Ductile Iron		
CB3T2L4-1		MH3T2-2		8	10	Ductile Iron		
MH3T2-3		MH3T2-2		8	85	Ductile Iron		
CB3T2L5-1		MH3T2-3		8	10	Ductile Iron		
CB3T2L6-1		MH3T2-3		8	10	Ductile Iron		

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DESCRIPTION SEWER INSPECTION
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FROM		TO		SEWER PIPE				
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	INSPECTION DATE	COMMENTS & GENERAL CONDITION
MH3T2-4		MH3T2-3		8	90	Ductile Iron		
CB3T2L7-1		CB3T2-4		8	10	Ductile Iron		
CB3T2L8-1		CB3T2-4		8	10	Ductile Iron		
SEWER MAIN #3 TRUNK #3								
CB3T3-1		MH3T2-1		8	75	Ductile Iron		Valved.
CB3T3L1-1		CB3T3-1		8	50	Ductile Iron		
CB3T3L1-2		CB3T3L1-1		8	35	Ductile Iron		
CB3T3L1-3		CB3T3L1-2		8	35	Ductile Iron		
CB3T3-2		CB3T3-1		8	100	Ductile Iron		
CB3T3-3		CB3T3-2		8	100	Ductile Iron		
CB3T3-4		CB3T3-3		8	88	Ductile Iron		
CB3T3-5		CB3T3-4		8	88	Ductile Iron		
CB3T3L2-1		CB3T3-5		8	75	Ductile Iron		

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FROM		TO		SEWER PIPE			INSPECTION	COMMENTS & GENERAL CONDITION
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
CB3T3-6		CB3T3-5		8	50	Ductile Iron		
CB3T3-7		CB3T3-6		8	115	Ductile Iron		
CB3T3L3-1		CB3T3-7		8	75	Ductile Iron		
CB3T3L3-2		CB3T3-7		8	40	Ductile Iron		
CB3T3L4-1		CB3T3-7		8		Ductile Iron		
CB3T3L4-2		CB3T3-7		8		Ductile Iron		
CB3T3-8		CB3T3-7		8	30	Ductile Iron		
CB3T3-9		CB3T3-8		8	50	Ductile Iron		
SEWER MAIN #4								
CB4-1		CB2-4		36	75	Concrete		
MH4-2		CB4-1		36	80	Concrete		
MH4-2A		MH4-2		36	340	Concrete		
MH4-2B		MH4-2A		36	95	Concrete		

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FROM		TO		SEWER PIPE			INSPECTION	COMMENTS & GENERAL CONDITION
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
CB4-3		MH4-2B		36	105	Concrete		
CB4-4		CB4-3		30	134	Concrete		
CB4-5		CB4-4		30	108	Concrete		
CB4L1-1		CB4-5		6	20	Ductile Iron		Valved.
CB4-6		CB4-5		30	110	Concrete		
CB4-7		CB4-6		30	126	Concrete		
CB4-8		CB4-7		30	42	Concrete		
CB4-9		CB4-8		24	108	Concrete		
CB4-9A		CB4-9		24	80	Concrete		Valved
CB4-10		CB4-9A		18	100	Concrete		Valved.
CB4T3L1-1		CB4-10		12	65	Concrete		
CB4-10A		CB4-10		18	160	Concrete		
CB4-11		CB4-10A		18	800	Concrete		

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FROM		TO		SEWER PIPE			INSPECTION	COMMENTS & GENERAL CONDITION
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
CB4-12		CB4-11		18	96	Terra Cotta		
CB4L2-1		CB4-12		12	36	Terra Cotta		
CB4-13		CB4-12		18	216	Terra Cotta		
CB4L3-1		CB4-13		12	25	Terra Cotta		
CB4-14		CB4-13		18	252	Terra Cotta		
CB4L4-1		CB4-14		12	36	Terra Cotta		
CB4-15		CB4-14		18	198	Terra Cotta		
SEWER MAIN #4 TRUNK #1								
MH4T1-1		CB4-2		16	40	Concrete		
MH4T1L1-1		MH4T1-1			15	Concrete		Valved.
CB4T1-2		MH4T1-1		16	115	Concrete		
MH4T1-3		CB4T1-2		16	65	Concrete		
CB4T1-4		MH4T1-3		16	120	Concrete		

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FROM		TO		SEWER PIPE				
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	INSPECTION DATE	COMMENTS & GENERAL CONDITION
CB4T1L2-1		CB4T1-4			65	Concrete		
CB4T1-5		CB4T1-4		24	40	Concrete		
CB4T1-6		CB4T1-5		24	30	Concrete		
SEWER MAIN #4 TRUNK #2								
CB4T2-1		CB4-9A		12	220	Terra Cotta		Valved
CB4T2-2		CB4T2-1		12	110	Terra Cotta		Valved
CB4T2L1-1		CB4T2-2		6	108	Terra Cotta		
CB4T2-3		CB4T2-2		10	60	Terra Cotta		
CB4T2L2-1		CB4T2-3		6	60	Terra Cotta		
CB4T2L3-1		CB4T2-3		6	60	Terra Cotta		
CB4T2-4		CB4T2-3		8	60	Terra Cotta		
CB4T2L4-1		CB4T2-3		6	60	Terra Cotta		
CB4T2L5-1		CB4T2-4		6	60	Terra Cotta		

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FROM		TO		SEWER PIPE				
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	INSPECTION DATE	COMMENTS & GENERAL CONDITION
CB4T2-5		CB4T2-4		6	60	Terra Cotta		
SEWER MAIN #4 TRUNK #3								
CB4T3-1		CB4-10		12	160	Terra Cotta		
CB4T3-2		CB4T3-1		12	80	Terra Cotta		
CB4T3L2-1		CB4T3-2		6	45	Terra Cotta		
CB4T3-3		CB4T3-2		10	135	Terra Cotta		
CB4T3L3-1		CB4T3-3		6	40	Terra Cotta		
CB4T3-4		CB4T3-3		8	125	Terra Cotta		
CB4T3-5		CB4T3-4		8	100	Terra Cotta		
SEWER MAIN #5								
CB5-1A		LS5-1		8	50	Ductile Iron		
LS5-1		PIPE-U1		8	50	C. S. Pipe		Above ground Forced Main
PIPE-U1		PIPE -A1		8	870	C. S. Pipe		Underground Forced Main
PIPE -A1		PJ5-2		8	820	C. S. Pipe		Above ground forced main in Butane Rail Yard

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FROM		TO		SEWER PIPE			INSPECTION	COMMENTS & GENERAL CONDITION
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
PJ5-2		LS5-3		8	100	C. S. Pipe		Above ground forced main to Pond in Yard #5
LS5-3		PIPE-U3		8	1,600	C. S. Pipe		Above ground Forced Main South over rail tracks
PIPE-U3		CB5-4		12	440	C. S. Pipe		Underground Forced Main to Sewer Main #4
CB5-4		CB4-4		12	40	Ductile Iron		Gravity sewer
CB5L1-1		CB5-4		12	30	Ductile Iron		
CB5L2-1		CB5-4		12	42	Ductile Iron		
SEWER MAIN #5 TRUNK #1								
LS5T1-1		PJ5-2		8	1,220	C. S. Pipe		Forced Main.
CB5T1-2		LS5T1-1		8	110	C. S. Pipe		
CB5T1-3		CB5T1-2		8	115	C. S. Pipe		
CB5T1-4		CB5T1-3		8	100	C. S. Pipe		
SEWER MAIN #5 TRUNK #2								
CB5T2-1		LS5T1-1		8	95	C. S. Pipe		
CB5T2-2		CB5T2-1		8	110	C. S. Pipe		

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FROM		TO		SEWER PIPE			INSPECTION	COMMENTS & GENERAL CONDITION
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
SEWER MAIN #5 TRUNK #3								
CB5T3-1		CB5-4		12	75	C. S. Pipe		Valved.
CB5T3-2		CB5T3-1		12	60	C. S. Pipe		
CB5T3-3		CB5T3-2		12	60	C. S. Pipe		
CB5T3-4		CB5T3-3		12	60	C. S. Pipe		
SEWER MAIN #6								
CB6-1		LS5-3						Overflow to Pond in Yard #5 (LS5-3)
CB6-2		CB6-1		36	350	Concrete		
CB6-3		CB6-2		36	180	Concrete		
CB6L1-1		CB6-3		110	80	Concrete		Valved.
CB6-4		CB6-3		36	100	Concrete		
CB6-5		CB6-4		36	70	Concrete		
CB6-6		CB6-5		24	30	Concrete		Valved.
CB6-7		CB6-6		12	80	Ductile Iron		

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FROM		TO		SEWER PIPE				
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	INSPECTION DATE	COMMENTS & GENERAL CONDITION
CB6-8		CB6-7		12	180	Ductile Iron		
CB6-9		CB6-8		12	60	Ductile Iron		
CB6-10		CB6-9		12	50	Ductile Iron		
CB6-11		CB6-10		12	50	Ductile Iron		
CB6-12		CB6-11		12	40	Ductile Iron		
SEWER MAIN #6 TRUNK #1								
CB6T1-1		CB6-1		18	200	Concrete		Valved drain to Pond in Yard #5 (LS5-3)
CB6T1L1-1		CB6T1-1		18	30	Concrete		
CB6T1-2		CB6T1-1		18	110	Concrete		
SEWER MAIN #6 TRUNK #2								
CB6T2-1		CB6-2		21	35	Concrete		
CB6T2-2		CB6T2-1		18	15	Concrete		
CB6T2-3		CB6T2-2		18	70	Concrete		
SEWER MAIN #6 TRUNK #3								
CB6T3-1		CB6-3		30	50	Concrete		

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FROM		TO		SEWER PIPE			INSPECTION	COMMENTS & GENERAL CONDITION
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
CB6T3-2		CB6T3-1		30	50	Concrete		
SEWER MAIN #6 TRUNK #4								
CB6T4-1		CB6-4		18	90	Concrete		
CB6T4-2		CB6T4-1		18	40	Concrete		
SEWER MAIN #6 TRUNK #5								
CB6T5-1		CB6-5		18	70	Concrete		
CB6T4-1		CB6T5-1		18	36	Concrete		
SEWER MAIN #7								
CB7-1		LS5-3			0	Concrete		Overflow to Pond in Yard #5 (LS5-3)
CB7-2		CB7-1			150	Concrete		Valved
CB7L1-1		CB7-2			150	Concrete		
CB7-3		CB7-2			170	Concrete		
SEWER MAIN #8								
CB8-1		LS5-3		60	165	Concrete		Valved drain to Pond in Yard #5 (LS5-3)
CB8-2		CB8-1		12	118	Concrete		

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STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	INSPECTION DATE	COMMENTS & GENERAL CONDITION
CB8-3		CB8-2		SWALE	530			
CB8L1-1		CB8-3		10	24	Cast Iron		
CB8-4		CB8-3		12	126			
CB8L2-1		PJ8-4		12	18	Cast Iron		
CB8-5		CB8-4		12	20			
SEWER MAIN #9								
LS9-1		API Separator		4	415	Carbon Steel		Above ground Forced Main.
CB9-2		LS9-1		6	100	PVC		
CB9L1-1		CB9-2		4	30	PVC		Valved.
CB9-3		CB9-2		6	85	PVC		
CB9L2-1		CB9-3			60	Wood		
CB9-4		CB9-3		6	15	PVC		
CB9-5		CB9-4		6	35	PVC		

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STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
CB9L3-1		CB9-5			25	Wood Box		Clogged.
CB9-5A		CB9-5		6	75	Cast Iron		
CB9-6		CB9-5A		6	55	Cast Iron		Valved.
CB9L4-1		CB9-6		6	70	Cast Iron		
MH9-7		CB9-6		6	170	Cast Iron		
CB9-8		MH9-7		6	115	Cast Iron		
LS9-9		CB9-8		3	80	Carbon Steel		Above ground Forced Main.
SEWER MAIN #9 TRUNK #1								
CB9T1-1		CB9-3			45	Wood		Clogged.
CB9T1-2		CB9T1-1			50	Wood		Clogged.
CB9T1-3		CB9T1-2			55	Wood		Clogged.
CB9T1-3A		CB9T1-3			55	Wood		Clogged.
CB9T1-4		CB9T1-3A			50	Wood		Clogged.

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STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	DATE	
CB9T1-5		CB9T1-4		TRENCH	260			
CB9T1-6		CB9T1-5			45	Wood		Valved.
SEWER MAIN #10								
LS10-1		LS5-3		4	130	Carbon Steel		Above ground Forced Main to Pond (LS5-3)
CB10-2		LS10-1		6	120	Ductile Iron		
CB10-3		CB10-2		6	95	Ductile Iron		
CB10-4		CB10-3		6	90	Ductile Iron		
CB10-5		CB10-4		6	80	Ductile Iron		
CB10L1-1		CB10-5		6	70	Ductile Iron		Valved drain from Pond (LS5-3)
CB10-6		CB10-5		6	140	Ductile Iron		
SEWER MAIN #11 NEW BURMA ROAD SEWER SYSTEM								
LS11-1	N/A	CB1-15S	N/A	4	260	Carbon Steel		Above ground Forced Main to Tank-1218 or CB1-15S
MH11-2	6.9982	LS11-1	6.7042	10	220	Ductile Iron	10-Nov-2004	
CB11-2E	10.2907	MH11-2	10.3007	6	40	Ductile Iron	29-Nov-2004	

BAYONNE INDUSTRIES, Incorporated
FOOT of 22nd STREET
BAYONNE, NJ 07002
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APPENDIX B2
SEWER LINE INSPECTION FORM

PROJECT No. BA - 0507
DESCRIPTION SEWER INSPECTION
CALCULATED BY BTT DATE 30-Sep-2005
CHECKED BY _____ DATE _____

FROM		TO		SEWER PIPE				
STRUCTURE No.	INV. ELEV. NAD'83 in FT.	STRUCTURE No.	INV. ELEV. NAD'83 in FT.	SIZE DIA. IN.	LENGTH FEET	CONSTRUCTION	INSPECTION DATE	COMMENTS & GENERAL CONDITION
MH11-3	7.6048	MH11-2	7.0290	8	110	Ductile Iron	11-Nov-2004	
CB11-3E	9.1133	MH11-3	7.9567	6	15	Ductile Iron	30-Nov-2004	
MH11-4	7.7148	MH11-3	7.6348	8	20	Ductile Iron	17-Nov-2004	
CB11-4E	10.1867	MH11-4	8.9067	6	15	Ductile Iron	30-Nov-2004	

BAYONNE INDUSTRIES, Incorporated
FOOT of 22nd STREET
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APPENDIX C1
QUARTERLY ANALYSIS SUMMARY
SEWER STRUCTURES

PROJECT No. BA - 0507
DESCRIPTION SEWER INVESTIGATION
SHEET No. 1 OF 3
CALCULATED BY BTT DATE 30-Sep-05
CHECKED BY DATE

ITEM	SOIL	25060149-001	25060149-002	25060149-003	25060942-001	25060942-002	25060942-003	25060942-004	25081865-005	25081865-001	25090930-001	25090930-002
Sample Date	CLEANUP	6/2/2005	6/2/2005	6/2/2005	6/15/2005	6/15/2005	6/15/2005	6/15/2005	8/31/2005	8/31/2005	9/20/2005	9/20/2005
	NON-RESIDENTIAL CRITERIA NRDCSCC	CB1T2-1	CB1T2-2	CB1T2L2-1	MH1T1-1	MH1T1-3	MH1T1-5	MH1T1-7	UNOFFICIAL MH2-2	UNOFFICIAL CB4-1	PRELIMINARY CB4-2A	PRELIMINARY MH4T1-7
% Total Solids		78.30%	78.60%	44.00%	61.60%	52.30%	78.30%	69.30%	58.40%	69.40%	33.00%	44.00%
pH		6.9	6.6	8.3	6.7	7.0	6.3	6.5	NA	NA	7.4	7.0
Ignitability		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide - mg/kg	21,000	0.320	0.320	0.570	0.410	0.480	0.320	0.360	0.430	1.220	0.760	0.800
Sulfide - mg/kg		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenols - mg/kg	(3)	9.200	20.700	30.500	7.140	10.100	5.560	9.580	NA	NA	NA	NA
TPHC - mg/kg		15,400	60,100	160	2,600	36,200	24,200	3,140	382,864	128,725	276,000	21,500
PCBs - mg/kg	2	U	U	U	U	U	U	U	U	U	U	U
Pesticides - mg/kg	(1)	U	U	U	U	U	U	U	U	U	U	U
METALS - mg/kg												
Antimony	340	2.740	4.950	7.420	13.000	4.970	26.800	11.600	9.260	4.700	41.900	20.300
Arsenic	20	18.500	***33.400***	***59.300***	***60.000***	***34.500***	***72.000***	***43.400***	***105.000***	***91.900***	***42.800***	***534.000***
Barium	47,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	2	0.110	0.100	0.180	0.630	0.140	0.410	0.125	0.030	0.030	0.210	0.210
Cadmium	100	0.480	0.940	0.960	0.570	0.630	0.110	1.770	2.450	1.860	1.600	11.800
Chromium	6,100	32.500	78.200	55.200	85.400	50.800	151.000	192.000	202.000	48.200	203.000	182.000
Copper	600	230.000	***734.000***	375.000	345.000	***1,380.000***	373.000	***1,050.000***	***2,870.000***	151.000	***1,840.000***	365.000
Lead	600	332.000	405.000	472.000	513.000	358.000	***3,370.000***	***2,300.000***	***3,560.000***	***1,340.000***	***902.000***	***3,980.000***
Mercury	270	2.200	1.500	0.039	0.029	0.649	0.038	0.166	0.273	0.087	0.220	0.090
Nickel	2,400	42.400	49.100	38.100	122.000	39.500	131.000	221.000	76.100	30.500	45.700	46.700
Selenium	3,100	1.430	1.240	2.200	1.970	1.760	1.430	1.570	2.680	2.310	4.690	2.630
Silver	4,100	1.710	1.490	2.640	2.370	2.110	1.710	1.880	0.510	0.430	5.510	3.160
Thallium	2	0.570	0.500	0.880	1.320	1.060	0.570	0.630	0.170	0.140	1.050	1.050
Vanadium	7,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	1,500	501.000	***2,400.000***	355.000	744.000	258.000	***4,430.000***	835.000	642.000	472.000	312.000	551.000
TOTAL METALS - mg/kg		1,165.640	3,710.420	1,368.919	1,889.289	2,132.119	8,558.068	4,659.141	7,470.473	2,143.157	3,400.680	5,697.940
TOTAL SVOC + VOC - ug/kg	10,000,000	2,306,809	2,081,215	122,807	2,686,733	2,306,809	2,081,215	122,807	2,393,997	2,624,535	*	*

NOTES	
(1)	Varies with compound.
(2)	Health based criteria exceeds the 1,000,000 ug/kg total VOC criteria.
(3)	Health based criteria exceeds the 10,000,000 ug/kg total organic criteria.
*	Complete analysis not received yet.
U	Analyzed for, but, undetected.
NA	Not analyzed for.

BAYONNE INDUSTRIES, Incorporated
FOOT of 22nd STREET
BAYONNE, NJ 07002
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APPENDIX C1
QUARTERLY ANALYSIS SUMMARY
SEWER STRUCTURES

PROJECT No. BA - 0507
DESCRIPTION SEWER INVESTIGATION
SHEET No. 2 OF 3
CALCULATED BY BTT DATE 30-Sep-05
CHECKED BY DATE

ITEM	SOIL	25060149-001	25060149-002	25060149-003	25060942-001	25060942-002	25060942-003	25060942-004	25081865-005	25081865-001	25090930-001	25090930-002
Sample Date	CLEANUP	6/2/2005	6/2/2005	6/2/2005	6/15/2005	6/15/2005	6/15/2005	6/15/2005	8/31/2005	8/31/2005	9/20/2005	9/20/2005
VOC - ug/kg	NON-RESIDENTIAL CRITERIA NRDCSCC	CB1T2-1	CB1T2-2	CB1T2L2-1	MH1T1-1	MH1T1-3	MH1T1-5	MH1T1-7	UNOFFICIAL MH2-2	UNOFFICIAL CB4-1	PRELIMINARY CB4-2A	PRELIMINARY MH4T1-7
Acetone	(2)	U	U	U	U	U	U	U	U	U	*	*
Acrylonitrile	5,000	U	U	U	U	U	U	U	U	U	*	*
Benzene	13,000	7,980	254	174	U	334	324	939	U	U	*	*
Bromodichloromethane	46,000	U	U	U	U	U	U	U	U	U	*	*
Bromoform	370,000	U	U	U	U	U	U	U	U	U	*	*
Bromomethane	(2)	U	U	U	U	U	U	U	U	U	*	*
2-Butanone (MEK)	(2)	U	U	U	U	U	U	U	U	U	*	*
Carbon tetrachloride	4000	U	U	U	U	U	U	U	U	U	*	*
Chlorobenzene	680,000	19,900	2,350	1,590	277	U	U	U	U	U	*	*
Chloroform	28,000	U	139	U	U	U	U	U	U	U	*	*
Chloromethane	(2)	U	U	U	U	U	U	U	U	U	*	*
Dibromochloromethane	(2)	U	U	U	U	U	U	U	U	U	*	*
1,2-Dichlorobenzene	(2)	U	U	U	U	459	U	U	U	U	*	*
1,3-Dichlorobenzene	(2)	U	U	U	U	U	U	U	U	U	*	*
1,4-Dichlorobenzene	(2)	U	U	U	U	U	82	169	U	U	*	*
1,1-Dichloroethane	(2)	U	U	U	U	U	U	U	U	U	*	*
1,2-Dichloroethane	24,000	U	U	U	U	U	U	U	U	U	*	*
1,1-Dichloroethene	150,000	U	U	U	U	U	U	U	U	U	*	*
1,2-Dichloroethene	(2)	U	3,687	U	U	U	U	U	301	185	*	*
1,2-Dichloropropane	43,000	U	U	U	U	U	U	U	U	U	*	*
1,3-Dichloropropane	5,000	U	U	U	U	U	U	U	U	U	*	*
Ethylbenzene	(2)	595	112	U	167	270	528	3,030	U	U	*	*
Hexachlorobutadiene	21	U	U	U	U	U	U	U	U	U	*	*
Methyl t-Butyl Ether (BTBE)		323	U	U	U	U	U	U	U	U	*	*
4-Methyl-2-pentanone (MIBK)	(2)	U	U	U	U	U	U	U	U	U	*	*
Methylene chloride	210,000	U	U	U	U	U	U	U	U	U	*	*
Styrene	97,000	U	296	U	U	U	U	U	U	U	*	*
1,1,1,2-Tetrachloroethane	310,000	U	U	U	U	U	U	U	U	U	*	*
1,1,2,2-Tetrachloroethane	70,000	U	U	U	U	U	U	U	U	U	*	*
Tetrachloroethene (PCE)	6,000	U	U	U	U	U	U	U	U	U	*	*
Toluene	(2)	781	1,750	U	202	469	568	278	199	155	*	*
1,2,4-Trichlorobenzene	(2)	U	U	U	U	U	U	U	U	U	*	*
1,1,1-Trichloroethane	(2)	U	U	U	U	U	U	U	U	U	*	*
1,1,2-Trichloroethane	420,000	U	U	U	U	U	U	U	U	U	*	*
Trichloroethene (TCE)	54,000	U	445	264	U	U	U	U	U	U	*	*
Vinyl chloride	7,000	U	U	U	U	U	U	U	U	U	*	*
m+p-Xylenes	(2)	1,630	334	264	361	993	2,050	811	455	U	*	*
o-Xylene	(2)	2,240	538	217	390	1,110	881	465	403	U	*	*
Other Isomers of Benzene		135,400	65,740	9,230	182,500	163,900	249,000	187,700	6,300	9,170	*	*
Others (Unknown)		98,300	68,340	17,210	53,600	484,200	276,800	161,000	79,700	230,120	*	*
TOTAL VOC - ug/kg	1,000,000	267,149	143,985	28,949	237,497	651,735	530,233	354,392	87,358	239,630	*	*

BAYONNE INDUSTRIES, Incorporated
FOOT of 22nd STREET
BAYONNE, NJ 07002
(201) 437 - 2200

APPENDIX C1
QUARTERLY ANALYSIS SUMMARY
SEWER STRUCTURES

PROJECT No. BA - 0507
DESCRIPTION SEWER INVESTIGATION
SHEET No. 3 OF 3
CALCULATED BY BTT DATE 30-Sep-05
CHECKED BY DATE

ITEM	SOIL	25060149-001	25060149-002	25060149-003	25060942-001	25060942-002	25060942-003	25060942-004	25081865-005	25081865-001	25090930-001	25090930-002
Sample Date	CLEANUP	6/2/2005	6/2/2005	6/2/2005	6/15/2005	6/15/2005	6/15/2005	6/15/2005	8/31/2005	8/31/2005	9/20/2005	9/20/2005
SVOC - ug/kg	NON-RESIDENTIAL CRITERIA NRDCSCC	CB1T2-1	CB1T2-2	CB1T2L2-1	MH1T1-1	MH1T1-3	MH1T1-5	MH1T1-7	UNOFFICIAL MH2-2	UNOFFICIAL CB4-1	PRELIMINARY CB4-2A	PRELIMINARY MH4T1-7
Acenaphthene	(3)	7,490	5,170	1,030	35,700	20,600	174,000	33,100	6,870	U	*	*
Anthracene	(3)	U	U	748	U	U	U	27,300	U	U	*	*
Benzo(a)anthracene	4,000	U	U	1,050	***18,000***	U	***11,700***	***12,800***	***21,900***	U	*	*
Benzo(b)fluoranthene	4,000	U	U	U	***9,110***	U	***6,390***	3,980	3,650	U	*	*
Benzo(k)fluoranthene	40,000	U	U	U	3,790	U	2,390	1,530	3,110	U	*	*
Benzo(a)pyrene	660	U	U	U	U	U	U	4,870	U	U	*	*
Benzyl Alcohol	(3)	U	U	U	U	U	U	U	U	U	*	*
Bis (2-chloroethyl) ether	3,000	U	U	U	U	U	U	U	U	U	*	*
Bis(2-chloroisopropyl) ether	(3)	U	U	U	U	U	U	U	U	U	*	*
Bis (2-ethylhexyl) phthalate	210,000	18,900	16,200	6,700	49,600	20,400	13,300	12,600	52,900	56,400	*	*
Butylbenzyl phthalate	(3)	U	U	U	U	U	U	U	U	U	*	*
4-Chloroaniline	4,200,000	U	U	U	U	U	U	U	U	U	*	*
4-Chloro-3-methyl phenol	(3)	U	U	U	U	U	U	U	U	U	*	*
2-Chlorophenol	5,200,000	U	U	U	U	U	U	U	U	U	*	*
Chrysene	40,000	9,220	7,140	1,850	20,000	18,200	14,000	15,600	14,100	U	*	*
Dibenzo (a,h) anthracene	660	U	U	U	U	U	U	U	U	U	*	*
Dibenzofuran		U	U	U	U	U	U	U	U	U	*	*
Di-n-butyl phthalate	(3)	U	U	U	U	U	U	U	U	U	*	*
Di-n-octyl phthalate	(3)	U	U	U	U	U	U	U	U	U	*	*
1,4- Dichloro Benzene	(3)	U	U	U	U	U	U	U	U	U	*	*
3,3'-Dichloro benzidine	6,000	U	U	U	U	U	U	U	U	U	*	*
2,4-Dichloro phenol	3,100,000	U	U	U	U	U	U	U	U	U	*	*
Diethyl phthalate	(3)	U	U	U	U	U	U	U	U	U	*	*
2,4-Dimethyl phenol	(3)	U	U	U	U	U	U	U	U	U	*	*
Dimethyl phthalate	(3)	U	U	U	U	U	U	U	U	U	*	*
2,4-Dinitro phenol	2,100,000	U	U	U	U	U	U	U	U	U	*	*
2,4-&2,6-Dinitro toluene	4,000	U	U	U	U	U	U	U	U	U	*	*
Fluoranthene	(3)	U	10,800	2,260	34,900	15,400	14,800	40,700	10,700	U	*	*
Fluorene	(3)	11,900	9,620	1,320	64,500	37,100	30,100	35,900	U	U	*	*
Hexachloro benzene	2,000	U	U	U	U	U	U	U	U	U	*	*
Hexachloro butadiene	21,000	U	U	U	U	U	U	U	U	U	*	*
Hexachloro cyclopentadiene	7,300,000	U	U	U	U	U	U	U	U	U	*	*
Hexachloro ethane	100,000	U	U	U	U	U	U	U	U	U	*	*
Indeno(1,2,3-cd)pyrene	4,000	U	U	U	U	U	U	U	U	U	*	*
Isophorone	(3)	U	U	U	U	U	U	U	U	U	*	*
2-Methyl naphthalene	(3)	U	15,500	U	20,000	U	35,500	59,200	U	U	*	*
2-Methyl phenol	(3)	U	U	U	U	U	U	U	U	U	*	*
3 + 4-Methyl phenol	1,000,000	U	U	U	U	U	U	U	U	U	*	*
Naphthalene	4,200,000	U	U	U	U	U	U	42,800	2,650	U	*	*
Nitrobenzene	520,000	U	U	U	U	U	U	U	U	U	*	*
n-Nitroso diphenyl amine	600,000	U	U	U	U	U	U	U	U	U	*	*
n-Nitroso-di-n-propylamine	660	U	U	U	U	U	U	U	U	U	*	*
Pentachloro phenol	24,000	U	U	U	***30,900***	U	U	U	U	U	*	*
Phenol	(3)	U	U	U	U	U	U	U	U	U	*	*
Phenanthrene		24,500	18,700	2,210	117,000	43,100	59,100	108,000	13,200	U	*	*
Pyrene	(3)	15,300	11,200	3,050	17,500	15,000	10,400	31,800	17,400	U	*	*
Pyridine		U	U	U	U	U	U	U	U	U	*	*
2,4,5-Trichloro phenol	(3)	3,850	U	U	U	U	U	U	U	U	*	*
2,4,6-Trichloro phenol	270,000	U	U	U	U	U	U	U	U	U	*	*
Other Isomers of Benzene		0	0	9,340	61,900	0	0	197,000	0	0	*	*
Other Poly Aromatics		84,200	229,700	0	0	396,000	735,500	542,800	0	0	*	*
Others (Unknown)		1,864,300	1,613,200	64,300	1,673,600	1,407,000	917,700	384,100	206,990	24,500	*	*
TOTAL SVOC - ug/kg		2,039,660	1,937,230	93,858	2,156,500	1,972,800	2,024,880	1,554,080	353,470	80,900	*	*

BAYONNE INDUSTRIES, Incorporated
FOOT of 22nd STREET
BAYONNE, NJ 07002
(201) 437 - 2200

APPENDIX C2
QUARTERLY ANALYSIS SUMMARY
SEWER SILT DISPOSAL

PROJECT No.	BA - 0507			
DESCRIPTION	SEWER INVESTIGATION			
SHEET No.	1	OF	3	
CALCULATED BY	BTT	DATE	30-Sep-05	
CHECKED BY		DATE		

ITEM		252243.00	25081865-002	25081865-003		ITEM	SOIL	25081865-004	
Sample Date		6/20/2005	8/31/2005	8/31/2005		Sample Date	CLEANUP	8/31/2005	
	HAZARDOUS WASTE CRITERIA	TCLP Extract Roll-Off EQ-224[4]	UNOFFICIAL TCLP Extract Roll-Off EQ-235[4]	UNOFFICIALT CLP Extract Roll-Off R3217RT[4]			NON-RESIDENTIAL CRITERIA NRDCSCC	UNOFFICIAL PP+40 Composite[5]	
% Total Solids		80.00%	71.50%	75.50%		% Total Solids		73.70%	
pH	2 ≤ pH ≥ 12.5	7.9	9.6	9.4		pH		NA	
Ignitability	≤ 140°F	> 212	> 140	> 140		Ignitability		NA	
Cyanide - mg/l	250.0	2.50	0.35	0.33		Cyanide - mg/kg	21,000	0.50	
Sulfide - mg/l	500.0	2.50	3.50	3.30		Sulfide - mg/kg		NA	
Phenols - mg/l		NA	NA	NA		Phenols - mg/kg	(3)	NA	
TPHC - mg/l		3,900	NA	NA		TPHC - mg/kg		128,153	
PCBs - mg/l	(1)	U	U	U		PCBs - mg/kg	2	U	
Pesticides - mg/l	(1)	U	U	U		Pesticides - mg/kg	(1)	U	
METALS - mg/l						METALS - mg/kg			
Antimony		NA	NA	NA		Antimony	340	5.210	
Arsenic	5.0	0.500	3.480	1.500		Arsenic	20	***2,290.000***	
Barium	100.0	0.390	0.890	0.850		Barium	47,000	NA	
Beryllium		NA	NA	NA		Beryllium	2	0.030	
Cadmium	1.0	0.050	0.060	0.030		Cadmium	100	30.900	
Chromium	5.0	0.050	0.050	0.050		Chromium	6,100	43.200	
Copper		NA	NA	NA		Copper	600	315.000	
Lead	5.0	1.000	***70.700***	***68.200***		Lead	600	***20,500.000***	
Mercury	0.2	0.001	0.005	0.005		Mercury	270	0.646	
Nickel		NA	NA	NA		Nickel	2,400	38.600	
Selenium	1.0	0.500	0.125	0.125		Selenium	3,100	2.270	
Silver	5.0	0.050	0.150	0.150		Silver	4,100	0.410	
Thallium		NA	NA	NA		Thallium	2	0.140	
Vanadium		NA	NA	NA		Vanadium	7,100	NA	
Zinc		NA	NA	NA		Zinc	1,500	442.000	
TOTAL METALS - mg/l		2.541	75.460	70.910		TOTAL METALS - mg/kg		23,668.406	
						TOTAL SVOC + VOC - ug/kg	10,000,000	928,683	

NOTES	
(1)	Varies with compound.
(2)	Health based criteria exceeds the 1,000,000 ug/kg total VOC criteria.
(3)	Health based criteria exceeds the 10,000,000 ug/kg total organic criteria.
(4)	TCLP Analysis of Roll-Off after solidification with kiln dust for transport off-site.
(5)	Composite sample of EQ235 & R3217RT after solidification with kiln dust for transport off-site.
*	Complete analysis not received yet.
U	Analyzed for, but, undetected.
NA	Not analyzed for.

BAYONNE INDUSTRIES, Incorporated
FOOT of 22nd STREET
BAYONNE, NJ 07002
(201) 437 - 2200

APPENDIX C2
QUARTERLY ANALYSIS SUMMARY
SEWER SILT DISPOSAL

PROJECT No.	BA - 0507			
DESCRIPTION	SEWER INVESTIGATION			
SHEET No.	2	OF	3	
CALCULATED BY	BTT	DATE	30-Sep-05	
CHECKED BY		DATE		

ITEM		252243.00	25081865-002	25081865-003
Sample Date		6/20/2005	8/31/2005	8/31/2005
VOC - ug/l	HAZARDOUS WASTE CRITERIA	TCLP Extract Roll-Off EQ-224[4]	UNOFFICIAL TCLP Extract Roll-Off EQ-235[4]	UNOFFICIALT CLP Extract Roll-Off R3217RT[4]
Acetone		NA	NA	NA
Acrylonitrile		NA	NA	NA
Benzene	500	3	U	U
Bromodichloromethane		NA	NA	NA
Bromoform		NA	NA	NA
Bromomethane		NA	NA	NA
2-Butanone (MEK)	200,000	10	U	U
Carbon tetrachloride	500	1	U	U
Chlorobenzene	100,000	210	U	U
Chloroform	6,000	13	U	U
Chloromethane		NA	NA	NA
Dibromochloromethane		NA	NA	NA
1,2-Dichlorobenzene		NA	NA	NA
1,3-Dichlorobenzene		NA	NA	NA
1,4-Dichlorobenzene		2	NA	NA
1,1-Dichloroethane		NA	NA	NA
1,2-Dichloroethane	500	1	U	U
1,1-Dichloroethene	700	1	U	U
1,2-Dichloroethene		NA	NA	NA
1,2-Dichloropropane		NA	NA	NA
1,3-Dichloropropane		NA	NA	NA
1,4-Diethylbenzene		NA	NA	NA
Ethylbenzene		NA	NA	NA
1,4-Ethyltoluene		NA	NA	NA
Hexachlorobutadiene		NA	NA	NA
Methyl t-Butyl Ether (MTBE)		NA	NA	NA
4-Methyl-2-pentanone (MIBK)		NA	NA	NA
Methylene chloride		NA	NA	NA
Styrene		NA	NA	NA
1,1,1,2-Tetrachloroethane		NA	NA	NA
1,1,2,2-Tetrachloroethane		NA	NA	NA
Tetrachloroethene (PCE)	700	3	U	U
Toluene		NA	NA	NA
1,2,4-Trichlorobenzene		NA	NA	NA
1,1,1-Trichloroethane	500	NA	NA	NA
1,1,2-Trichloroethane	500	NA	NA	NA
Trichloroethene (TCE)		360	U	U
Vinyl chloride	200	1	U	U
m+p-Xylenes		NA	NA	NA
o-Xylene		NA	NA	NA

ITEM	SOIL CLEANUP	25081865-004
Sample Date		8/31/2005
VOC - ug/kg	NON-RESIDENTIAL CRITERIA NRDCSCC	UNOFFICIAL PP+40 Composite[5]
Acetone	(2)	U
Acrylonitrile	5,000	U
Benzene	13,000	146
Bromodichloromethane	46,000	U
Bromoform	370,000	U
Bromomethane	(2)	U
2-Butanone (MEK)	(2)	U
Carbon tetrachloride	4000	U
Chlorobenzene	680,000	U
Chloroform	28,000	U
Chloromethane	(2)	U
Dibromochloromethane	(2)	U
1,2-Dichlorobenzene	(2)	U
1,3-Dichlorobenzene	(2)	U
1,4-Dichlorobenzene	(2)	U
1,1-Dichloroethane	(2)	U
1,2-Dichloroethane	24,000	U
1,1-Dichloroethene	150,000	U
1,2-Dichloroethene	(2)	U
1,2-Dichloropropane	43,000	U
1,3-Dichloropropane	5,000	U
1,4-Diethylbenzene		U
Ethylbenzene	(2)	718
1,4-Ethyltoluene		U
Hexachlorobutadiene	21	U
Methyl t-Butyl Ether (MTBE)		U
4-Methyl-2-pentanone (MIBK)	(2)	U
Methylene chloride	(2)	U
Styrene	210,000	U
1,1,1,2-Tetrachloroethane	97,000	U
1,1,2,2-Tetrachloroethane	310,000	U
Tetrachloroethene (PCE)	70,000	U
Toluene	6,000	418
1,2,4-Trichlorobenzene	(2)	U
1,1,1-Trichloroethane	(2)	U
1,1,2-Trichloroethane	(2)	U
Trichloroethene (TCE)	420,000	U
Vinyl chloride	54,000	U
m+p-Xylenes	7,000	1,540
o-Xylene	(2)	471
Other Isomers of Benzene		77,700
Others (Unknown)		151,300
TOTAL VOC - ug/kg	1,000,000	232,293

BAYONNE INDUSTRIES, Incorporated
FOOT of 22nd STREET
BAYONNE, NJ 07002
(201) 437 - 2200

APPENDIX C2
QUARTERLY ANALYSIS SUMMARY
SEWER SILT DISPOSAL

PROJECT No. BA - 0507
DESCRIPTION SEWER INVESTIGATION
SHEET No. 3 OF 3
CALCULATED BY BTT DATE 30-Sep-05
CHECKED BY _____ DATE _____

ITEM		252243.00	25081865-002	25081865-003		ITEM	SOIL	25081865-004
Sample Date		6/20/2005	8/31/2005	8/31/2005		Sample Date	CLEANUP	8/31/2005
SVOC - ug/l	HAZARDOUS WASTE CRITERIA	TCLP Extract Roll-Off EQ-224[4]	UNOFFICIAL TCLP Extract Roll-Off EQ-235[4]	UNOFFICIALT CLP Extract Roll-Off R3217RT[4]		SVOC - ug/kg	NON-RESIDENTIAL CRITERIA NRDCSCC	UNOFFICIAL PP+40 Composite[5]
Acenaphthene		NA	NA	NA		Acenaphthene	(3)	21,000
Anthracene		NA	NA	NA		Anthracene	(3)	U
Benzo(a)anthracene		NA	NA	NA		Benzo(a)anthracene	4,000	***6,420***
Benzo(b)fluoranthene		NA	NA	NA		Benzo(b)fluoranthene	4,000	1,590
Benzo(k)fluoranthene		NA	NA	NA		Benzo(k)fluoranthene	40,000	1,170
Benzo(a)pyrene		NA	NA	NA		Benzo(a)pyrene	660	U
Benzyl Alcohol		NA	NA	NA		Benzyl Alcohol	(3)	U
Bis (2-chloroethyl) ether		NA	NA	NA		Bis (2-chloroethyl) ether	3,000	U
Bis(2-chloroisopropyl) ether		NA	NA	NA		Bis(2-chloroisopropyl) ether	(3)	U
Bis (2-ethylhexyl) phthalate		NA	NA	NA		Bis (2-ethylhexyl) phthalate	210,000	***228,000***
Butylbenzyl phthalate		NA	NA	NA		Butylbenzyl phthalate	(3)	U
4-Chloroaniline		NA	NA	NA		4-Chloroaniline	4,200,000	U
4-Chloro-3-methyl phenol		NA	NA	NA		4-Chloro-3-methyl phenol	(3)	U
2-Chlorophenol		NA	NA	NA		2-Chlorophenol	5,200,000	U
Chrysene		NA	NA	NA		Chrysene	40,000	7,010
Dibenzo (a,h) anthracene		NA	NA	NA		Dibenzo (a,h) anthracene	660	U
Dibenzofuran		NA	NA	NA		Dibenzofuran		15,700
Di-n-butyl phthalate		NA	NA	NA		Di-n-butyl phthalate	(3)	U
Di-n-octyl phthalate		NA	NA	NA		Di-n-octyl phthalate	(3)	U
1,4- Dichloro Benzene	7,500	2	U	U		1,4- Dichloro Benzene	(3)	U
3,3'-Dichloro benzidine		NA	NA	NA		3,3'-Dichloro benzidine	6,000	U
2,4-Dichloro phenol		NA	NA	NA		2,4-Dichloro phenol	3,100,000	U
Diethyl phthalate		NA	NA	NA		Diethyl phthalate	(3)	U
2,4-Dimethyl phenol		NA	NA	NA		2,4-Dimethyl phenol	(3)	U
Dimethyl phthalate		NA	NA	NA		Dimethyl phthalate	(3)	U
2,4-Dinitro phenol		NA	NA	NA		2,4-Dinitro phenol	2,100,000	U
2,4-&2,6-Dinitro toluene	130	10	U	U		2,4-&2,6-Dinitro toluene	4,000	U
Fluoranthene		NA	NA	NA		Fluoranthene	(3)	13,800
Fluorene		NA	NA	NA		Fluorene	(3)	23,800
Hexachloro benzene	130	10	U	U		Hexachloro benzene	2,000	U
Hexachloro butadiene	500	10	U	U		Hexachloro butadiene	21,000	U
Hexachloro cyclopentadiene		NA	NA	NA		Hexachloro cyclopentadiene	7,300,000	U
Hexachloro ethane	3,000	10	U	U		Hexachloro ethane	100,000	U
Indeno(1,2,3-cd)pyrene		NA	NA	NA		Indeno(1,2,3-cd)pyrene	4,000	U
Isophorone		NA	NA	NA		Isophorone	(3)	U
2-Methyl naphthalene		NA	NA	NA		2-Methyl naphthalene	(3)	68,200
2-Methyl phenol	200,000	10	U	U		2-Methyl phenol	(3)	U
3 + 4-Methyl phenol	200,000	10	U	U		3 + 4-Methyl phenol	1,000,000	U
Naphthalene		NA	NA	NA		Naphthalene	4,200,000	42,300
Nitrobenzene	2,000	10	U	U		Nitrobenzene	520,000	U
n-Nitroso diphenyl amine		NA	NA	NA		n-Nitroso diphenyl amine	600,000	U
n-Nitroso-di-n-propylamine		NA	NA	NA		n-Nitroso-di-n-propylamine	660	U
Pentachloro phenol	100,000	100	U	U		Pentachloro phenol	24,000	U
Phenol		NA	NA	NA		Phenol	(3)	U
Phenanthrene		NA	NA	NA		Phenanthrene		71,000
Pyrene		NA	NA	NA		Pyrene	(3)	9,900
Pyridine	5,000	100	U	U		Pyridine		U
2,4,5-Trichloro phenol	400,000	10	U	U		2,4,5-Trichloro phenol	(3)	U
2,4,6-Trichloro phenol	2,000	10	U	U		2,4,6-Trichloro phenol	270,000	U
Other Isomers of Benzene						Other Isomers of Benzene		7,180
						Other Poly Aromatics		0
						Others (Unknown)		179,320
						TOTAL SVOC - ug/kg		696,390