FEB - 5 1990

STATE OF NEW JERSEY

DEPT. OF ENVIRONMENTAL PROTECTION

FAX TRANSMITTAL FORM

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The attached document has been designed within the framework of a three-tiered approach. These are:

Tier I. Clean-up Action: Requires OSC to oversee clean-up of surface oil slick and, where appropriate, vegetation. Continued monitoring of extent of spill.

Tier II. Short-term Action: Requires mapping, sampling and analysis of extent of spill to contribute immediate information for the damage assessment.

Tier III. Long-term Action: Requires long-term studies designed to determine subtle, long-term chronic effects on the ecosystem. These will also contribute to the damage assessment.

As has been discussed previously, it is assumed that the design and implementation of Tier II is an integral part of the entire process and is not exclusive of components involved in Tiers I and III. This work plan is assumed to involve only immediate studies and is limited to a one-year timeframe. NJDEP recognizes that many effects from the oil spill may not be distinguishable without conducting long-term studies in selected areas. Those studies are considered part of Tier III and should be designed carefully by a technical committee over the next few months. NJDEP also recognizes that part of the Tier II work must include funding for analysis of samples collected since the oil spill by various agencies and individuals.

It is hoped that at the meeting on February 7, 1990 we will be able to discuss any changes that may be necessary to this revised draft. In addition, we should focus on supporting the immediate clean-up actions being conducted by the On-Scene Coordinator and on determining what actions need to be taken to enhance damaged habitats for the return of the migratory birds in March.

Distribution List

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Revised 2/2/90

CONFIDENTIAL AND PRIVILEGED

DRAFT
SCOPE OF SERVICES

SHORT-TERM INVESTIGATIONS TO SUPPORT A NATURAL RESOURCE DMAGE ASSESSMENT FOR THE JANUARY 2, 1990 SPILL OF NO. 2 FUEL OIL INTO THE ARTHUR KILL

I. INTRODUCTION

On January 2, 1990 a spill of No. 2 fuel oil occurred in the Arthur Kill. There is serious concern that this spill, in excess of 500,000 gallons, has caused major natural resource damages to the estuary. Through a cooperative effort New Jersey, New York and appropriate federal agencies have developed a comprehensive program to address this environmental disaster. As part of this program it is necessary to conduct a damage assessment for this spill.

The Trustees recognize the need for a comprehensive investigation of this oil spill coupled with immediate clean-up actions and long-term investigations to explore the complexities of sub-lethal fate and effects of oil contamination in the Arthur Kill estuary. Of immediate concern is the need to enhance the on-going clean-up work with a comprehensive field and laboratory assessment of the extent and potential damage caused by the spill to provide the Trustees with information pertinent to the completion of a short-term damage assessment. There is an immediate need to implement programs to protect resident and migratory birds. To address these concerns the Trustees have designed a three-tiered approach, as follows:

Tier I - Clean-up Action: Requires OSC to oversee clean-up of surface oil slick and, where appropriate, vegetation. Continued monitoring of extent of spill.

Tier II - Short-term Action: Requires mapping, sampling and analysis of extent of spill to contribute immediate information for the damage assessment.

Tier III - Long-term Action: Requires long-term studies designed to determine subtle, long-term chronic effects on the ecosystem. These will also contribute to the damage assessment.

The purpose of this document is to provide an outline of work that needs to be completed through this year to provide the information necessary for a comprehensive damage assessment and protect/enhance resources damaged by the spill. Tier I and Tier III will be addressed concurrently with the design and implementation of Tier II, but are not directly a part of this scope of services.

Revised 2/2/90

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This document is divided into a series of sections, each of which outlines steps in the work plan for supporting a short-term damage assessment. Of importance to this second tier are the following objectives:

1. Determine the geographic distribution of the spill;

2. Determine the occurrence of oil in different habitats in the area;

3. Determine extent and depth of penetration of the oil in sediments;

4. Determine the extent, degree and effects of oiling in wetlands;

5. Characterize the bird population and its habitats;

6. Determine the effects of the oil spill on returning migratory species, including but not exclusive of, direct effects from oiled habitats, loss of or damage to prey organisms, and loss or modification of habitat;

7. Determine exposure to biota through extensive analysis of clams and mussels;

8. Determine appropriate analytical approaches to identifying hydrocarbon contamination in the system;

9. Develop QA/QC procedures associated with sample collection and analysis.

The Trustees recognize that these short-term actions are just part of a comprehensive investigation to determine the damage suffered by the Arthur Kill estuary during this incident. It is the contractors' responsibility to stay abreast of the actions being undertaken for Tier I and Tier III of this investigation and to ensure that Tier II is appropriately integrated with the overall damage assessment program.

II. COMPILATION OF EXISTING INFORMATION

A. Baseline Data

The contractor should compile, through literature searches and agency-supplied data, the following background information.

1. Historical information on contamination of water, sediments, suspended particulates and biota in the Arthur Kill estuary and adjacent waterways should be compiled. This compilation should include monitoring data from discharges to the

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2. Areas where previous intensive research studies, monitoring studies, or other pertinent studies have been conducted should be identified and compiled on base maps.

3. Additional information on spills that have occurred in the estuary since the time of the spill should be compiled in table form. Spill locations should be indicated on base maps. This should include spills up to one year prior to the Exxon incident. This information should include, minimally, amount and type of oil spilled. Additional information might include chemical analysis of the pure product spilled and spatial distribution of the spill.

4. All samples collected since the oil spill should be cataloged. This would include mapping location of sampling sites, listing the type of sample collected, when it was collected, who collected it, how it was collected, how it is stored and where it is stored. Results for any samples that have been analyzed should be included in this compilation.

B. Research Investigations Support

As part of the tiered approach to a damage assessment it is necessary that the first-year work be tied in directly to appropriate on-going research in the area. To this end, it is necessary for the contractor to catalog what research has been conducted in the estuary and, where appropriate, include sampling locations as outlined in section A above.

The contractor will work closely with the Trustees' technical committee to determine what samples have been collected, if they should be analyzed and what short-term support needs to be provided for the Trustees and outside researchers who have conducted immediate studies and sample collection in the Arthur Kill estuary.

III. MAPPING

A. Mapping Tasks

1. Delineate the areal extent of tainted land, marsh, shoreline and open water which was influenced by oil from the spill. Data to be used to delineate the areal extent of the oil spill shall include:

a. maps
b. field notes
c. reports
d. aerial photographs & other photographs
e. personal observations
f. other data sources

Contacts as sources for this data shall include:

a. Exxon employees
b. New York State DEC personnel

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Contacts as sources for this data shall include:

a. Exxon employees
b. New York State DEC personnel

c. NJDEP
d. NOAA and Coast Guard personnel
e. New York City and other local personnel
f. Other eyewitnesses

Should data be available to create time-series delineations of oil along the shoreline/marsh, the contractor shall produce a series of maps showing these trends. Daily (or more frequent) maps should be produced for the two weeks following the spill.

2. Characterize and delineate the natural resources, habitat types, and ownership of the area including:

a. wetland habitat types by major species or species associations; including cordgrass (Spartina alterniflora), reed grass (Phragmites australis), intermediate marsh (Spartina patens, Distichlis spicata), scrub/shrub marsh (Iva, Baccharis) and transitional marsh (facultative wetlands species);

b. the upper wetlands boundary between upland and wetland;

c. shoreline delineation along the land water interface;

d. beach, mudflat, other flats;

e. open water; and

f. ownership boundaries.

The contractor shall field-verify the delineations.

3. The contractor shall make overflights of the impacted area during the periods of June 20 - July 20, 1990 and October 1 - 31, 1990, using false color infrared film, in stereo with 60% overlap and 30% side overlaps. This mission shall produce 9" x 9" transparent frames at a suitable scale to interpret habitat changes in stereo. Additional criteria covering the overflight criteria will be provided by the Trustees.

4. The contractor shall use the photography obtained in Task 3 to photo-interpret and compare with the habitat delineations made from historical photography. (NJDEP has July 1989 panoramic IR photography and may have mapping format photography for use as a baseline; and NYSDEC has aerial photography from October 1989.) The contractor shall note changes in vegetation in terms of areal extent, vigor, density, color or any other parameter which may reflect a change in condition of the vegetation.

5. All cartographic data shall be digitized by the contractor in a format that is compatible with the NJDEP's and NYSDEC's Geographic Information Systems. The Trustees will provide the contractor with suitable mylar photobase maps on which to delineate, and access to historical photography for interpretation.

c. NJDEP
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The data generated by the contractor ultimately reside in NJDEP's and NYSDEC's Geographic Information Systems (GIS). This section describes the technical specifications for digitizing that Contractors must follow to produce digital map data this is compatible with NJDEP's and NYSDEC's GIS data.

1. Before digitizing any data, the contractor shall completely describe and fully explain the digitizing procedures to be used.

2. Mylar proof plots of all data digitized by the Contractor shall be forwarded to the Trustees together with the manuscript resource overlap maps from which they were digitized for inspection and acceptance by the state. All proof plots and manuscripts submitted for inspection and acceptance shall be tested against the standards of this document, and if the standard is met the Trustees shall "accept" that proof plot. If the standards are not met, the Trustees shall withhold payment until the standard is met.

3. Each mylar proof plot shall be registered to the manuscript resource overlay from which it was digitized. Any discrepancy in line placement from the digital data not meeting the specifications of this document shall be returned to the contractor for editing. Edited maps will be replotted on mylar by the contractor an resubmitted for the Trustees' inspection and acceptance.

4. The final mapped products produced shall be of a quality appropriate to facilitate the conversion by the contractor of the delineated information to digital ARC/INFO compatible format. All digitized data prepared by the contractor shall meet all of the following specifications:

a. ARC/INFO compatible format includes digitizing directly into ARC/INFO format or producing tapes in DLG-3 (optional) format. NJDEP's ARC/INFO runs on a Prime 9955. If the contractor's software is ARC/INFO running on a non-prime CPU, the Trustees shall require the use of "ARC Export" or "Tapewrite" commands when writing the file to tape.

b. All proof plots shall be reproduced on mylar with a neat line registered to the manuscript final resource mylar overlays from which it was digitized.

c. The digitization of the final delineated line shall be accomplished using the center of the delineated line.

d. The final digitized data shall have an accuracy tolerance to the final delineated line of 90% within 0.01". The remaining 10% of the linework shall be within .02" of the final delineated line.

e. Plotter pen widths shall be 0.010" for all final plots. Ink rapidograph pens shall be used in plotting. All plots shall be produced on stable base mylar.

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f. Topology shall be created and all map features labelled and coded.

g. Manuscript delineation resource mylar overlay maps from which the line was digitized shall be provided to the State with the mylar proof plots in order to verify the digital line placement.

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i. The contractor shall resubmit edited maps, replotted on mylar, to the Trustees for inspection.

j. Final acceptance will be given for each proof plot when the standards of this document are met.

IV. SUSPENDED PARTICULATE AND BOTTOM SEDIMENT SAMPLING

This portion of the work will involve: collection and analysis of suspended particulate and bottom sediment samples; compiling existing baseline data; and providing support for sampling efforts tied directly to previous sampling and data collection of sediment and suspended particulate samples.

A. Site Selection

Sample collection should encompass all of the habitats located in the Arthur Kill estuary. These habitats should include: subtidal, low intertidal, medium intertidal, and high intertidal zones. It is suggested that depositional areas be targeted for sampling as these are the areas most likely to suffer from long-term effects of contamination. Representative sampling areas that include all of the above mentioned habitats should be selected where oil contamination was known to be high, medium and low (as defined by the OSC and other observers) and similar sites outside of the influence of the spill should be selected as control stations. It is proposed that a minimum of three sites be selected for each level of oil contamination (high, medium, low) and two sites be selected as controls. Site selection criteria should, within reason, correspond to areas where baseline data exist. It is suggested that additional single station sites be selected for enhancing the spatial distribution of the sampling. These could help define a possible extent of contamination beyond that identified by sheen.

C. Sediment Sampling

1. Sediment cores will be collected using stainless steel coring tubes along two parallel transects through the different habitats: subtidal to high intertidal. Gravity cores or equivalent hand-held coring devices should be used. Core diameter should be great enough to provide sufficient sediment for chemical analysis

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State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF SCIENCE AND RESEARCH
CN 409, Trenton, N.J. 08625

Robert K. Tucker, Ph.D.
Director

Leslie J. McGeorge, M.S.P.H.
Deputy Director

TO: Distribution List

THROUGH: Michael Catania, Deputy Commissioner, New Jersey Dept. of Environmental Protection

FROM: Dr. Robert Tucker, PhD., Director, Division of Science and Research, New Jersey Dept. of Environmental Protection RKT

SUBJECT: Revised draft outline for proposed investigations in support of a damage assessment for the January 2, 1990 Exxon No. 2 fuel oil spill in the Arthur Kill.

DATE: February 2, 1990

At the request of the Trustees, the New Jersey Department of Environmental Protection (NJDEP) has prepared the attached revised draft document outlining work to be conducted in support of a comprehensive damage assessment. It is hoped that this letter and the attached document will enhance the Trustees' development of a plan for a damage assessment.

The NJDEP has attempted to address the reviewers' comments received in the last week. If we did not receive comments from you, we assumed that you and/or your agency approved of the work plan as it was written in the first draft. However, as this draft is substantially different from the earlier draft (and presumably improved based on the comments we did receive), it would be advisable that everyone read this version.

It is hoped that the Trustees will find this draft substantially closer to a final version to send out to a contractor. It must be emphasized again that this document is intended to address only a part of a comprehensive damage assessment. Essentially, this document focuses on the immediate collection of appropriate samples in the Arthur Kill estuary to assist in a damage assessment.

on a 2 cm-thick core section.

2. Sampling spacing between cores should emphasize the low intertidal zone more than the other zones. It is suggested that one core be collected in each zone, except the intertidal where two cores are collected. This would yield a total of 10 cores for each sampling stations. One complete transect would be archived.

3. Each core should be approximately 30-40 cm long. Cores should be collected and sectioned immediately in the field. Cores should be sectioned at 2 cm intervals for the first 10 cm, then at 5 cm intervals through the rest of the core. All sections should be stored in glass canisters and frozen until analysis.

B. Chemical Characterization

In addition to the analytical procedures outlined in Section VI, the following procedures should be used for sediment analysis.

1. Initially, selected sediment core samples collected in each of the habitats at the different sampling stations will be extracted and analyzed.

2. GC/FID, or the appropriate technique, should be conducted on the 0-2 cm section of each core collected from one transect at each of the nine sampling stations, from the control station and from several single cores collected at additional locations. This would yield approximately 60 initial sediment samples for analysis.

3. Based on the initial chemical analysis of the 0-2 cm section, a subset of those samples will be selected for further identification and possible fingerprinting. This additional analytical work will be determined by the analytical procedures outlined in the Section VI.

4. Based on the chemical results from 2 and 3, additional samples could be selected from the archived core samples and analyzed by GC-FID, or the appropriate technique.

5. Following these analysis a small set of sediment samples will be selected for priority pollutant analysis. Sample selection will depend on GC-FID analysis and on the proximity of samples to baseline data stations where priority pollutant information exists on bottom sediment samples.

D. Suspended Particulate Sampling

A small number of suspended particulate samples will be collected to determine, if possible, whether the adsorbed fraction of the No. 2 fuel oil measured on tidal flat sediments is detectable, and bioavailable, in the water column.

1. Large volume (10 - 15 liter) suspended particulate samples

will be collected in the water column in the subtidal zone at maximum ebb tide at each of three highly contaminated sampling sites and at a control site.

2. Water samples will be transported to the lab and filtered or centrifuged to concentrate the suspended fraction. This should yield greater than 1 gm of particulate matter for chemical analysis.

3. Suspended particulates will be stored frozen until analyzed by GC-FID, or the appropriate technique.

4. Filtrate should be stored at 1-4°C for possible future analysis.

V. BIOLOGICAL SAMPLING

A. General

1. All biological samples should be retained for possible further analysis or autopsy, according to accepted QA/QC procedures, including those spelled out in Section VII.

2. All biological sampling should include (where applicable) measurements of standard water quality parameters, including temperature, salinity, and dissolved oxygen.

B. Catalogue of Existing Samples

1. As a first step in the assessment of biological effects, all samples collected by agencies and researchers since the spill should be catalogued, with complete information on each sample, including species, date collected, location, sampling method, sample preparation (if any), and holding conditions.

C. Wetlands

1. Assemble existing baseline information on extent and vigor of marsh vegetation, including but not limited to infrared photography from 1974, 1988, and 1989.

2. Repeat infrared surveys in appropriate time periods (see Section III).

3. Assess Spartina populations and populations of other wetland plant species important to wildlife (e.g., degree of oiling, biomass density, productivity, death of plants, etc.) in areas that experienced heavy, moderate, and no oiling. Assessment should be performed prior to arrival of migratory bird populations (February), during growing season (July), and at end of growing season (October). Repeat assessments performed in the past, especially in those areas that were affected by the spill, to obtain pre- and post-spill data in the same areas.

4. If feasible, measure levels of primary production on the marsh substrate in heavily oiled, moderately oiled, and unaffected areas, and repeat any previous baseline studies, especially in areas that were affected by the spill.

D. Benthic and Infaunal Invertebrates

1. Site selection should be based on, and coordinated with, site selection for bottom sediment samples (see Section IV).

2. At all sites, collect bivalves (including, but not limited to, soft-shell clams, ribbed mussels, and blue mussels) for chemical analysis. Where possible, stratify sampling according to depth below sediment surface. Each sample should include a sufficient number of individuals of the species sampled to yield the amount of tissue needed for the analyses to be performed under Section VI.

3. To support long-term investigations of impacts and recovery, assess benthic invertebrate community structure at each station sampled. Provide complete data on benthic community, including species composition and abundance, evenness, and diversity. Sampling should be carried out monthly.

4. Coordinate with and provide support for ongoing assessments of spill effects on populations of fiddler crabs (Uca pugnax) in tidal creeks. (These are important prey organisms for birds.)

E. Birds

1. Assemble existing baseline information on abundance, reproduction, and feeding ecology of breeding birds on Pralls Island, Shooters Island, Island of Meadows, and other areas along the Arthur Kill.

2. Document and map occurrence of shorebirds in these areas. Document and map habitat areas used by the shorebird species, including nesting areas, breeding areas, and feeding areas. Document value of various habitat areas to various shorebird species.

2. Both to assist in damage assessment and to support long-term studies of impact and recovery, assess breeding bird populations that inhabit or use the affected areas for appropriate endpoints, including reproductive success (hatching and fledging), use/avoidance of affected areas, body burdens of contaminants. These studies should begin prior to the peak nesting season and continue throughout the year.

3. Continue collection of dead and injured birds within one mile of the Arthur Kill shoreline. Document oil-related deaths and injuries among birds throughout the area since the spill, including areas beyond the immediate spill impact area. Investigate reports of bird kills in other parts of the area, e.g., Rockaway.

VI. CHEMICAL ANALYSES

Sediment, suspended particulate, and biological samples collected under Sections IV and V, as well as sediment, suspended particulate, biological, water, and oil samples collected by various agencies and researchers since the time of the spill, are to be analyzed by a method that combines IR screening with fingerprinting via GC/FID. All applicable quality control/quality assurance requirements, including those spelled out in Section VII, shall be followed. The contractor should have demonstrated competence in both analytical areas, including familiarity and experience with Modified USEPA/NJDEP Method 418.1 (Total Recoverable Petroleum Hydrocarbons -- Freon extraction/IR detection) and with Modified ASTM Method D3328-78 (Gasoline and Oil Fingerprinting -- Methylene Chloride Extraction, Capillary Column Gas Chromatography with Flame Ionization Detection). The contractor should also be able to perform analyses that represent modifications of these methods, including use of alternative solvents. The final selection of analytical methods will be made following consultation between the Trustees and the contractor.

VII. Quality Assurance/Quality Control

Specific quality control procedures such as blanks, calibration curves, standards, matrix spikes, and replicate samples are described in Method 418.1. Several of these items are outlined below. Other QA/QC requirements may be spelled out upon consultation between the contractor and the Trustees.

	Type of Sample		
	Sediment	Biological	Water
Chain-of-custody	Required	Required	Required
Sample containers	6 oz. glass jar	Al foil zip-lock bags	1 L glass bottle
Samplers	Consultant and/or agency personnel		
Preservation of samples	Frozen	Frozen	pH<2 with HCl, refrig. @1-4C
Reporting Requirements	As required by analytical protocols, including sample results, spectra, chromatograms, QC samples including reference "standards" of No. 2 fuel oil (neat and spiked into freon and methylene chloride or other solvents used)		

VIII. MODELLING

A. Assessment of Existing Models

1. Identify and describe existing circulation and transport models that may be applied to the study area, including generic

The New York Times
nytimes.com

January 4, 1990

Coast Guard Says Oil Spill Off S.I. Exceeds 200,000 Gallons

By DENNIS HEVESI

LEAD: The rupture of an underwater Exxon pipeline, far more serious than officials calculated on Tuesday, has allowed more than 200,000 gallons of heating oil to leak into the Arthur Kill between Staten Island and New Jersey. Environmentalists said the leak posed a significant danger to wildlife.

The rupture of an underwater Exxon pipeline, far more serious than officials calculated on Tuesday, has allowed more than 200,000 gallons of heating oil to leak into the Arthur Kill between Staten Island and New Jersey. Environmentalists said the leak posed a significant danger to wildlife.

On Tuesday, based on figures supplied by Exxon, the Coast Guard estimated that 5,000 gallons had spilled. But yesterday, amid confusion about the amount, Exxon and the Coast Guard estimated that 200,000 to 500,000 gallons were fouling the 13-mile-long waterway. "This is a major spill," said Carol Ash, regional director of the New York State Environmental Conservation Department. The Coast Guard considers spills of more than 100,000 gallons major.

Shortly before dawn yesterday, a dozen birds were found dead in marshes on Prall's Island, a sanctuary for birds south of the Goethals Bridge. Conservation experts said birds returning north in the spring could face serious harm, because the spill is likely to kill the food they find in the wetlands along the waterway.

The spill involved No. 2 heating oil, which is not as light as gasoline, but not as heavy as the No. 6 crude oil spilled last year by the Exxon Valdez in Alaska. That spill left 11 million gallons of the heavy crude along 1,000 miles of the coast.

A 100-square-mile slick that cleanup crews continued to battle yesterday off the coast of Morocco involved 19 million gallons of crude oil that have spewed from a crippled Iranian supertanker.

Still, the Coast Guard considered the spill in the Arthur Kill serious enough that it dispatched four members of its Atlantic Strike Team, based in Mobile, Ala., to monitor the problem.

"That's the team that responds to major spills," a Coast Guard spokesman, Petty Officer Jeff Crawley, said. "They have tremendous amounts of resources available to them," should the cleanup, being run by Exxon, not prove sufficient.

Exxon officials said yesterday that a ship might have struck the pipleine, causing the rupture.

The Commander of the Port, Capt. Robert C. North, said the kill was closed to ship traffic yesterday.

"Basically, Exxon is doing a good job of cleaning up," Captain North said. He said 50 percent of the oil had evaporated. "It should all be contained or evaporated in three or four days," he added.

Asked about the confusion over the amount spilled, Captain North said, "On Tuesday, we went with the initial estimate of 5,000 from Exxon." Yesterday, however, "Exxon revised that and gave us a worst-case scenario of 500,000 gallons. But our observations from helicopter overflights indicated that that was too high." The 50,000 gallons would fill an Olympic-size pool.

Saying it was "difficult to make a ballpark guess, Coast Guard-wise we think it's more on the order of 200,000 gallons," Captain North said.

The executive officer of the port, Lieut. Comdr. Richard Softye, second in command, said it was far more difficult to estimate a leak from a pipe than from a vessel, because "we know exactly how much was on board and how much was lost."

"It's definitely not an exact science," he said. "We have to depend on Exxon's engineers."

The 12-inch-wide 6.7-mile pipeline runs from the Bayway Refinery in Linden, N.J., under the Arthur Kill to the northwestern tip of Staten Island and under the Kill van Kull to an Exxon terminal in Bayonne, N.J.

At a news conference yesterday at Bayway, an Exxon executive, Kitty Cochrane, said: "Divers examining the pipeline as part of Exxon's investigation into the cause of the leak have found evidence which would suggest it had been hit by a ship. The line has been moved and creased and has a tear."

Ducks, Geese and Crabs

Ms. Cochrane said the tear, which was found about 150 feet from the docks at Bayway, was half an inch wide and four feet long. At that point, the pipe is rising to enter Bayway and is supposed to be about seven feet under water. "The pipeline had been physically moved," she said, to about 25 feet below the surface.

Ms. Ash said the environmental department was trying to assess the impact of the spill.

"The heron are in the South, fortunately, right now," she said. "But there are a lot of ducks and geese flying over right now that usually feed in this area. And we do know that the fiddler crab has been hurt. We're out there now with our biologists and bird people trying to determine just how bad it is.

She said a major concern was "the oil up on Pralls Island, which is the rookery for herons, snowy egrets and some common egrets.

"The heron are an endangered species," Ms. Ash said. "Pralls Island and Shooters Island, with Goethals in the middle, is where the state has been purchasing land to serve as a basic feeding and rookery area, where they give birth."

'They Ingest the Oil'

Lynn Mahaffy of Tri-State Bird Rescue and Research, a group from Delaware that was called in to aid the wildlife, said 12 dead birds were yesterday found on Pralls Island. "And we have nine live birds here with us now that we are trying to stabilize," she said.

Ms. Mahaffy said the oil "destroys the water repellency of the bird."

"Then," she added, "when they get wet, they freeze to death. This oil is not really thick enough for them to be choking on it. But when they preen their feathers, they ingest the oil, and secondary things start happening to their insides like internal bleeding."

Carolyn Murray, a project associate for the Trust for Public Land, which operates the bird sanctuary on Pralls Island, said the spill "couldn't have happened in a worse place."

"These are tidal marshes, which are a fairly delicate ecosystem," she said. "This is a polluted environment, which is one of the reasons we are concerned that this will be one blow too many."

She said there were 300 to 500 nesting pairs of herons, egrets and ibises on the island, adding:

"They nest in colonies on the higher ground, so their actual nesting sites probably won't be affected by the oil. But the tidal wetlands are where they forage for fish, crabs, worms, insects. The birds won't be back until spring. "What we're concerned about is that this animal life will not reproduce, so that when the birds come back, they will have a greatly reduced source of food. And then there's the fish of the Arthur Kill, which will probably be adversely affected. And the birds eat the fish."

A bright sun shone over the kill yesterday afternoon, somewhat brightening what even on the best of days is mostly a bleak stretch among garbage dumps, factories and a large Consolidated Edison plant on Staten Island and the oil refinery and other plants in New Jersey.

The spill made itself plain on the banks of the wetlands, where a high tide had darkened the soil a reddish brown.

The New York Times
nytimes.com

January 11, 1990

Leaking Exxon Pipe Ran Through Regulatory Limbo

By CRAIG WOLFF

LEAD: The Exxon leak-detection system that failed off Staten Island last week had never been checked for flaws by any oversight agency because of a series of gaps in regulatory responsibilities, company executives and various Federal and state officials said yesterday.

The Exxon leak-detection system that failed off Staten Island last week had never been checked for flaws by any oversight agency because of a series of gaps in regulatory responsibilities, company executives and various Federal and state officials said yesterday.

The system, which permitted more than 500,000 gallons of oil to rush into the Arthur Kill, fell outside of normal government monitoring procedures. Because the pipe runs between New York and New Jersey, neither state has jurisdiction. And because the pipe carried less than 350,000 barrels of oil an hour, the Federal Government was not required to check it for safety.

As a result, the pipeline fell into a kind of regulatory limbo, inspected only by the New York City Fire Department, which had responsibility for a short stretch above water. Only Exxon knew that the pipeline's detection mechanism was giving off false alarms. That apparently led operators to think that all was well on Jan. 1, when the pipeline suffered a severe gash, and to ignore two warning messages that a problem was at hand.

Wrong Signals for a Year

On Tuesday, Exxon said that the system was issuing wrong signals for the last year. Yesterday, company officials said the system had been working that way for the last 12 years. But they defended it as not malfunctioning but as being oversensitive.

George Tenley, the director of the office of pipeline safety in the Federal Department of Transportation, said his agency would have monitored the system if the pipe carried at least 350,000 barrels, or more than 20 percent of its capacity. Only 250,000 barrels, a small amount by industry standards, normally flow through the 6.7-mile pipe, which runs from Exxon's Bayway plant in Linden, N.J., under the Arthur Kill, through the northwestern tip of Staten Island and then back under water until it reaches a terminal in Bayonne, N.J., company officials said.

"Had we been monitoring this system, we would not have allowed this to go on," Mr. Tenley said. Mr. Tenley said he did not know how many pipelines in the country fell outside the rules in this fashion.

About Exxon's contention that its system is simply oversensitive, Thomas C. Jorling, the Commissioner of the New York State Department of Environmental Conservation, said: "They characterized themselves in a self-interested way, suggesting that their behavior was reasonable. That's not the issue.

Did their practices meet the standard of care that the law requires? That's the issue." In any case, the system apparently played a cruel twist on operators who had long ago concluded that the leak-detection system chronically misled them. The night the leak occurred, the detection system correctly indicated a problem, but an automatic shut-off system that is supposed to engage in the event of a leak did not work properly during six critical hours as the oil seeped away, Exxon officials said yesterday. The company said that its own investigation over the last week indicates that a faulty micro-switch is to blame.

"It was like a cry-wolf situation," said Edward T. DiCorcia, vice president of Exxon U.S.A. "The equipment betrayed us, but when the real cry came in, a tiny little switch prevented the cry from being heard."

The developments came as Exxon fell under increasingly heavy criticism and threats of lawsuits and investigations from the New York and New Jersey Attorneys General. The leak of 567,000 gallons of No. 2 heating oil, the largest oil leak ever in the New York area, damaged the bird sanctuaries and fish rookeries in the Arthur Kill that serve as crucial nesting and spawning areas for the East Coast, environmentalists said.

More than 200 dead birds have been recovered, mostly near Pralls Island on the Staten Island side. Other birds have been found alive but slicked with oil. Most of the winter fowl, environmental officials said, will return this spring to find most of their food supply - worms, crabs and other invertebrates - gone.

Middle-Aged Pipe

Mr. DiCorcia said yesterday that the cleanup has recovered 94,000 gallons of oil and that a large amount of oil had evaporated in the recent spate of warmer temperatures. But the company, he said, remained unsure as to what caused a half-inch-wide, four-foot-long tear just at the point where the pipe descends into the water, an area only about 150 feet from the control room at the Bayway terminal.

Either a vessel rammed the pipe, Mr. DiCorcia said, or it simply ruptured on its own. The pipe is 25 years old, about middle-aged for pipes of this kind.

At a news conference yesterday, Mr. DiCorcia reacted testily to questions about why Exxon waited more than a week to announce that the leak-detection system had not been working since the system was installed in 1978. The company did so only when New York State environmental officials disclosed conversations they had had with Exxon on Tuesday.

"We had five experts sifting back, talking to people who were on shift, getting all their accounts, looking at computer records, going down and making physical examinations, hearing what the divers had to say," Mr. DiCorcia said. "I wish an investigation like that could be done in a day."

The problems, he acknowledged, stemmed at least in part from a web of rules that left the pipeline and its leak-detection system outside of anyone's jurisdiction.

Mr. Tenley said his office has suspected that oil companies have been purposely operating just below minimum levels to avoid monitoring. He said his office is investigating whether Exxon has been doing this, as well as whether the company has been properly maintaining its leak-detection system.

Fire Department Checks

Because of a Federal statute allowing it to do so, the only authority that ever reviews the pipeline in any

way is the New York City Fire Department. John Mulligan, a department spokesman, said yesterday that the department performs only a visual check and only on the portion of the pipe that is above ground on Staten Island. That was last done on Nov. 16.

The department, he said, also receives quarterly "stress reports" from Exxon. Mr. Tenley said stress tests typically involve the operation of the pipe at one and half times its normal capacity for a certain period of time.

The New Jersey Department of Environmental Preservation requires any company dealing with hazardous materials to issue a plan in case of a spill. But John R. Hagerty, a spokesman for the department, said his office "has no role in monitoring the system."

"All they're required to do is submit this plan," he said. "To my knowledge, no one ever looks at the pipe below water, and they certainly never informed anyone that something was wrong with the leak-detection system."

'Like a Hair Trigger'

Mr. DiCorcia attributed the incident to several factors conspiring at the wrong moment. He said that the leak-detection system was going off "like a hair trigger" for years, but that the system's verification system was working. And he said that the pipeline had never sustained a leak.

Leaks are detected, he said, by meters at either end of the pipe. The meters measure how much oil is pumped at one end and how much is received at the other. When the meters indicate a difference of 10 barrels or more an hour, valves in the pipeline immediately shut down.

"The system would shut down erratically," Mr. DiCorcia said. "It would tell you something was wrong even if there wasn't anything wrong. It's not perfect but it continually erred on the safe side.

At 10:30 P.M. on Jan. 1, when the system shut down, Mr. DiCorcia said, the operators followed what by then was customary procedure. They turned the system back on as a way of verifying whether something was wrong. The system is designed to turn itself off immediately at that point if there is a leak.

Abrams Threatens Lawsuit

When the system shut down again at 2:28 A.M., the operators again turned it back on, he said, and again found no problem. It was not until a third shutdown at 4:10 A.M. that they decided to close the pipeline altogether and investigate the cause.

Robert Abrams, the New York State Attorney General, sent a letter to Exxon yesterday, saying that in addition to cleaning up the oil, Exxon must pay for a study to determine the environmental damage caused by the leak. He said if the company did not confess its liability within 48 hours, his office would file a lawsuit.

Mr. Abrams also announced that his office was beginning a joint criminal investigation of Exxon's practices concerning the pipeline with the environmental commissioners of New York and New Jersey and with the Staten Island District Attorney. The New Jersey Attorney General's office has also begun an investigation to determine if criminal procedures are warranted.

"It has become clear," Mr. Abrams wrote in a letter to Lee R. Raymond, the president of the Exxon Corporation, "that Exxon's failure to properly maintain and monitor its leak-detection system has led to one of the greatest avoidable ecological disasters in New York City's history."

The New York Times
nytimes.com

January 8, 1990

Exxon Faulted On Cleanup At Bird Refuge

By NICK RAVO

LEAD: A top New York State environmental official yesterday criticized the Exxon Corporation for its cleanup efforts on Pralls Island, a marshy bird sanctuary that was awash with heating oil last week after a rupture in one of the company's underwater pipelines in the Arthur Kill.

A top New York State environmental official yesterday criticized the Exxon Corporation for its cleanup efforts on Pralls Island, a marshy bird sanctuary that was awash with heating oil last week after a rupture in one of the company's underwater pipelines in the Arthur Kill.

Carol Ash, a regional director for the State Department of Environmental Conservation, said about 100 dead ducks and geese had been found Saturday on or near the two-mile-long island in the Arthur Kill. Seventy-two other dead birds have been recovered since the Jan. 2 leak along the waterway, an 11-mile tidal strait between Staten Island and New Jersey.

Ms. Ash said that Exxon promised on Saturday to post cleanup crews on Pralls Island on a 24-hour basis but that they did not arrive until noon yesterday. The island is about 1 1/2 miles from the site of the leak, near the company's Bayway refinery in Linden, N.J.

'They Have Been Slow to React'

"I am very distressed," the state official said. "The company's attitude has been fine, but they have been slow to react, and that's not comforting."

Capt. Robert North of the Coast Guard, who has been monitoring the cleanup, said, "They should have been working their way down by first light."

"It will be a few days before we get a lot of material in the marsh out," Captain North said.

Exxon officials said they were confused by Ms. Ash's totals. They said that 172 birds had died but that many had been found in various places in the Arthur Kill over the last few days, not on the island and not just Saturday. Nine more dead birds were found yesterday, and six were found injured.

The injured birds were taken to a makeshift center on Exxon property in Linden. There workers wearing Latex gloves wrapped towels around the birds, flushed their eyes with a saline solution, fed them intravenously and gave them Pepto-Bismol to coat their stomachs.

The greatest danger to the birds is that they may freeze to death or drown as their oil-coated feathers lose their ability to keep the birds warm and afloat. Neurological damage can also result if the birds ingest

the oil.

'Doing Everything We Can'

"We are doing everything we can," said an Exxon spokesman, Louis Jung.

He said six to eight boats had been ferrying dead and injured birds from Pralls Island and polluted waters to the rescue center, which was set up by the Tri-State Bird Rescue and Research Inc., a nonprofit wildlife consulting organization in Newark, Del.

"They called us as soon as this happened," said Joyce Ponsell, a spokeswoman for the organization.

Ms. Ash's criticism of Exxon came after a grand jury in New Jersey issued subpoenas to about six Exxon employees on Friday. This action occurred as law-enforcement officials continued a criminal investigation into the spill of at least 200,000 gallons of oil into the narrow waterway.

The New Jersey Attorney General's office accused Exxon officials on Friday of "stonewalling" the investigation. Christopher Florenz, a spokesman for Attorney General Peter N. Perretti Jr., said the inquiry was focusing on possible violations of the state's ocean-pollution statues.

Concern was also raised by Mayor David N. Dinkins of New York because Exxon initially reported a leak of 5,000 gallons. The company later raised the figure to 500,000 gallons. The Coast Guard lowered the estimate to 200,000 gallons.

Leak From 12-Inch Pipe

The leak came from a 12-inch-wide, 6.7-mile pipe that runs from Exxon's Bayway Refinery in Linden under the Arthur Kill to the northwestern tip of Staten Island and then under the Kill van Kull to an Exxon terminal at Bayonne, N.J.

Company officials have said that a half-inch-wide, four-foot-long tear in the pipe was found where it rises from the water near the Bayway plant.

The leak has left intermittent slicks and sheens the length of the Arthur Kill and along small portions of Newark Bay and the Kill Van Kull.

Also soiled were creeks, wetland areas and small islands, like Pralls, which sits amid a battery of smokestacks and oil tanks on its New Jersey side and a bucolic suburban landscape on its Staten Island side.

Pralls Island was taken over in 1984 by New York City's Parks and Recreation Department, which signed a $1-a-year lease with the Audubon Society. An 80-acre, 600-by-2,250-foot island south of the Goethals Bridge, it was the nation's first urban Audubon wildlife refuge, maintained primarily as a sanctuary for glossy ibises and snowy egrets.

Exxon crews spent yesterday setting up booms to corral the oil and skim it off the surface of the water. They also set up large absorbent pads around parts of Pralls Island. So far about 70,000 gallons of the light No. 2 heating oil have been recovered. Exxon expects about 30 to 50 percent of the remaining 130,000 gallons to evaporate.

Coast Guard officials said the waterway should be open for boating and shipping by today or Tuesday. "I think the cleanup is continuing to progress," Captain North said. "If there was any difficulty, it was getting started on Pralls Island."

The New York Times
nytimes.com

March 3, 1990

Exxon Halts Tanker Traffic In New Jersey

By DENNIS HEVESI

LEAD: The Exxon Corporation suspended tanker and barge traffic at its Bayway Refinery and Bayonne Terminal yesterday after two oil spills in waterways between New Jersey and Staten Island this week and the leak of 567,000 gallons of oil in the area two months ago.

The Exxon Corporation suspended tanker and barge traffic at its Bayway Refinery and Bayonne Terminal yesterday after two oil spills in waterways between New Jersey and Staten Island this week and the leak of 567,000 gallons of oil in the area two months ago.

Traffic will be suspended, Exxon executives said, until the company has completed an investigation of its procedures and equipment at the refinery and terminal.

The executives said the shutdown would not affect fuel supplies in the New York metropolitan region. The executives said trucks and pipelines could transport sufficient fuel, although Bayway, the company's sole refinery on the East Coast, will halt production.

"Exxon anticipates that gasoline, heating oil, propane and other products will continue to be made available to customers on an uninterrupted basis," the president of Exxon, Lee R. Raymond, said in a press release.

Experts From the Oil Company

The refinery produces 150,000 barrels, or 6.3 million gallons, of gasoline and heating oil a day. On average, one tanker and four barges arrive at the refinery each day. At Bayonne, where gasoline, heating oil and other products are stored, one tanker and five barges arrive on an average day.

The New York Attorney General, Robert Abrams, and Representative Robert G. Torricelli, Democrat of Hackensack, N.J., issued calls yesterday for independent investigations of Exxon operations at the refinery and terminal. Mr. Raymond said, however, that although consultants would be on an investigating team, it would primarily consist of experts from Exxon.

"Exxon places great emphasis on the integrity of its operations," Mr. Raymond said. "We deeply regret the recent accidents at our New Jersey facilities and the impacts and concerns they have caused.

"We are seriously committed to conducting our operations in a safe and environmentally responsibile manner, and we are taking these measures to demonstrate that commitment."

On Wednesday, more than 24,000 gallons of heating oil leaked from a hole in a barge at Bayonne,

spreading gobs of oil into Upper New York Bay past Liberty Island and forcing the closing of the Kill van Kull between Bayonne and Staten Island. On Thursday, 3,500 gallons of oil spilled into the Arthur Kill from a barge at the Bayway plant in Linden, N.J.

Occurring less than two months after a ruptured pipeline entering Bayway leaked 567,000 gallons of oil into the Arthur Kill, the new spills prompted New York and New Jersey officials to urge tighter control of the oil industry, including the possibility of court-appointed masters to run refineries and terminals.

In a letter sent yesterday to the chairman of Exxon, Lawrence G. Rawl, Mr. Torricelli wrote that the series of spills "raises serious questions about the safety and integrity of Exxon operations in the area."

"These events," he said, "have gone beyond the occasional industrial accident attributable to human error. Instead, they form a pattern of increasingly frequent and environmentally damaging events, which industry officials cannot condone or ignore. Our waterways are not an open sewer to be used as a disposal for the byproducts of industry negligence."

'Such a Sorry Record'

Mr. Torricelli requested that Exxon "immediately submit itself to an independent, external investigation of its pipeline, oil-loading and oil-transfer operations in its New Jersey-New York facilities."

Later, Mr. Abrams wrote to Mr. Raymond:

"There can be no satisfactory explanation for such a sorry record. After the Valdez tragedy," in which more than 11 million gallons of crude oil fouled 1,000 miles of beaches in Alaska last summer," "reasonable people had a right to expect Exxon to take comprehensive, systematic measures to prevent accidents."

Mr. Abrams said that the inquiry should be conducted under the supervision of New York and New Jersey officials and that the results should be made public.

Mr. Raymond said, however, that his team would "be composed of experts from other Exxon units, including international affiliates, as well as independent consultants."

Mr. Abrams called the Exxon moves a prudent action. "At the same time," he added, "it is imperative that Exxon not use these spills or this suspension as an excuse to jack up retail prices on gasoline, heating oil and other petroleum products. The public must not be made to pay more in order to insure that Exxon will not further damage the environment."

The New York Times
nytimes.com

June 10, 1990

Damage Seen From January Oil Spill

By ALLAN R. GOLD

LEAD: Five months after more than half a million gallons of oil spilled from a leaking pipeline into the Arthur Kill, environmentalists and conservationists say that many of their worst fears about damage to the fragile marine and bird life there are being realized.

Five months after more than half a million gallons of oil spilled from a leaking pipeline into the Arthur Kill, environmentalists and conservationists say that many of their worst fears about damage to the fragile marine and bird life there are being realized.

Researchers have found far fewer nests of herons, egrets and ibises in bird refuges in the narrow waterway between New Jersey and Staten Island than in past springs.

Clams and worms that the birds eat appear to have been significantly reduced in some mud flats and marshes along the Arthur Kill, where wildlife had been making a remarkable comeback after decades of decline, researchers said.

"The indications are that something has affected them and the largest anomaly this season is oil," said Andrew Willner, of the American Littoral Society, a conservation group based in Sandy Hook, N.J.

The manager of the Exxon Corporation's Bayway Refinery in Linden, N.J., which was the source of the leak, disputes those findings, but acknowledges that there have been "short term impacts" on wildlife.

One Million Gallons

The damage noted by environmentalists had begun before the latest oil spill in New York Harbor, a 260,000-gallon tanker leak last Thursday in the Kill van Kull. While the thick fuel oil from the tanker has apparently not hit sensitive bird refuges in the two kills, environmentalists see the spill as another setback for the harbor. At least one million gallons of oil have spilled into New York Harbor since January 1.

Conservationists are not sure how long it will take for the damage to reverse itself, particularly if the harbor continues to be soaked by new spills. In the short term, they say, life along the kills has taken a step backward.

Damage to the food chain is already evident in some places. Two researchers who have studied a mud flat along the Arthur Kill in Elizabeth, N.J., since 1986 are finding far less life.

"What was really striking was the diversity you could find here," said Dr. Keith Cooper, an associate

professor of toxicology at Rutgers University. "This year there's much fewer numbers of animals and grasses."

Dr. Angela Cristini, professor of biology at Ramapo College, said that many shore birds present in past years are now absent. There has also been a decrease in the number of minnow-like killifish, an important food source for wading birds and large fish, Dr. Cooper said, but it was not clear whether their decline was linked to the oil spill.

'It's Very Toxic'

On a trip Thursday to the Arthur Kill, she pointed to hundreds of clam shells visible in the mud at low tide, an indication of the high number that she said had died as a result of the spill.

A year ago, four researchers digging in the mud could find 30 clams in 15 minutes, Dr. Cristini said. Now, finding that many would take the same number of people an hour.

"It's very toxic," Dr. Cooper said of the post-spill enivironment. "There's no question about it."

Before the January spill, the Arthur Kill was known to local conservationists as the scene a remarkable ecological success story, particularly in the return of wading birds.

That any wildlife exists in places such as the Arthur Kill and the Kill van Kull is a source of amazement to many who live near their heavily industrialized shores. The two waterways have been dumping grounds for sewage and chemical pollutants for more than a hundred years.

Cleaner Water, More Birds

But advances in sewage treatment since the early 1970's have led to gains in water quality. And as food sources recovered, the wading birds started to return. Last year, 1,200 nesting pairs were observed. Also, 140 species of fish can be found in the Arthur Kill at some time during the year.

The improvements came despite nearly daily oil spills of one size or another. But after the big leak from the Exxon pipeline last January soiled many wetlands, concern rose about what would happen this year to the long-legged wading birds, their food sources and habitat.

In total, 694 dead birds were collected after the spill, 70 percent of which were judged to have died from effects of the accident, according to the Bayway manager, John P. Racz. Half were gulls, and the rest were ducks or geese. Clam and worm populations were also damaged in some areas, he said, but crabs appear to be thriving.

The long-legged wading birds, which began their migration from the south in mid-March. Final counts will not be available until September, when all young birds have left the nest.

Fewer Nests Seen

Peter Mott of the New York City Audobon Society described the early reports this season as "very grim." The society administers bird refuges at Shooters Island in the Kill van Kull and Pralls Island in the Arthur Kill.

The birds arrived earlier than usual from their southern wintering grounds. Warm spring weather

followed, presaging early nesting, a recent Audobon report said.

Instead, the report said, "the number of nests and the number of nests with eggs are not only lower than expected for a year of early return but also lower than in recent years."

But Mr. Racz said it is too early to judge what impact the spill had on the wading bird populations, which can vary from year to year. They will have to go through one migratory cycle before it can be determined if the food chain had been affected, he said.

"We'd like to see the scene played out," Mr. Racz said. "It could be minor or major. We just don't know."

Exxon faces lawsuits from New Jersey, the City of New York and the City of Elizabeth, N.J. for damage caused by the spill.

The New York Times
nytimes.com

March 20, 1991

Exxon Guilty Plea Is Expected in Harbor Spill

By ALLAN R. GOLD

The Exxon Corporation will plead guilty to a criminal charge in Federal District Court in Newark today and will pay a $5 million penalty as part of a deal to settle litigation over a 567,000-gallon oil spill 14 months ago in New York Harbor, a government official said yesterday.

Of the $5 million penalty, $1.8 million will go to New York State, and the rest to New Jersey and the Federal government, said the official, who spoke on condition of anonymity. The criminal charge, under the Clean Water Act, involves negligence in the training of personnel at Exxon's Bayway refinery in Linden, N.J., the official said.

In addition to the criminal penalty, Exxon will pay $10 million to New York State, New Jersey, New York City and Elizabeth, N.J., to settle civil litigation over damage to natural resources. Some money will be paid immediately and the rest over five years, the official said.

Some details of the settlement emerged last week, and environmental groups have criticized the agreement as too easy on Exxon. Yesterday, Representative Susan Molinari, Republican of Staten Island, urged the Federal Government and others involved in the talks to reject the $15 million package.

Company officials are scheduled to appear before Judge Nicholas H. Politan today to enter the plea, which would represent Exxon's second criminal plea and penalty this month. Last week, the company agreed to plead guilty to four Federal criminal counts and pay a $100 million penalty to settle charges arising from the Exxon Valdez oil spill in Alaska in 1989.

A spokesman at Exxon's Bayway refinery, Douglas O. Walt, said it would be inappropriate for the company to comment on pending legal activity. But Mr. Walt said Exxon regretted the Jan. 1, 1990, spill and shared public concern about its impact. "We took responsibility for the spill and we worked hard to minimize any damage," he said. "We've learned from the accident and look forward to continuing our improved operation in a safe, reliable and environmentally sound manner." Leaking Pipeline

Exxon had fought to avoid criminal indictments by state grand juries in New York and New Jersey. A Federal grand jury in Newark investigated the spill, and New York City and Elizabeth also filed civil suits against Exxon.

The accident involved a leaking underwater pipeline that connected Exxon plants in Linden and Bayonne, N.J. Heating oil spilled into the Arthur Kill, a narrow waterway that separates New Jersey and Staten Island.

The spill coated miles of New Jersey and New York shorelines, including Staten Island marshlands that have become home to a revived wildlife population in the heavily industrialized area. Hundreds of birds died and breeding of wading birds was disrupted.

Concern about the marshlands played a big role in determining where the $10 million settlement would be spent. A small amount will be paid to New York City and Elizabeth to compensate for their response to the oil spill, according to the government official who described the settlement. Elizabeth will also receive some money for enhancing its marina area. New York to Buy Land

Of the rest of the money, 64 percent will go to New York and the rest to New Jersey, the official said. New York will use $5 million to buy environmentally sensitive land in the Arthur Kill area and the rest of its share for managing wetlands in the area.

Under the settlement, Exxon would also be required to improve its oil-handling operations.

A00100

ATTACHMENT D

Effluent Water Cleanliness Projects - 1967 Budget

Bayway Refinery

On January 25, 1963, Bayway was cited by the New Jersey Department of Health and directed to cease polluting the Arthur Kill within 12 months. The unrealistically short time permitted was a legal and pressure tactic by the State to force us to act. The actual date of compliance has been extended periodically by the State following our presentation of evidence of satisfactory progress toward compliance with the citation. A Water Cleanliness Master Plan was subsequently developed at Bayway to meet the NJDH goals, and it is against this plan that our progress is measured by the State.

The Water Cleanliness Master Plan is a schedule of the projects that are required at Bayway to meet water quality criteria established by the NJDH. The projects included in the Master Plan were developed to accomplish the following:

A. Properly segregate sewer flows into three systems--condenser water, process or oily water, and sanitary sewers.

B. Revise process unit operations to eliminate or reduce to a practical minimum the discharge of pollutants. (Eg. Spent Caustic collection and disposal)

C. Treat in a segregated operating unit particularly strong or obnoxious waste streams. (Eg. Sour Water Treating Unit)

D. Improve existing facilities for gravity differential settling of water and oil.

E. Provide secondary treatment for the minimum volume of concentrated waste streams to remove emulsified oil, solids, colloids, and dissolved organic compounds which cannot be removed by gravity separation.

The attached Table I compares current effluent quality with target 1969 qualities for oil content, total organic carbon, and biochemical oxygen demand. The pollution reduction achieved by the proposed 1967 Budget projects is summarized in the attached Table II. Project BW 67-70 covers four separate facilities and the pollution reduction estimated for each facility is shown. The pollution reductions attributable to the Separator Modernization Project (anticipated 1967 Budget Addition) and Secondary Treatment (not definitively developed) are also shown.

APDennis/RHLarrabee/mbh
February 3, 1967
Bayway Refinery

Table I

1966 Effluent Water Quality (1)

Source	Flow MGPD	OIL ppm	OIL G PD	TOC (2) ppm	TOC (2) lbs/D	BOD (3) ppm	BOD (3) lbs/D
Refinery Process Water from Gravity Separators	12.0	100	1200	92	9,200	166	16,600
Refinery Cooling Water	150.7	11	1600	4	5,100	17	21,400
Chemical Plant Process and Cooling Water	43.3	8	350	52	18,800	48	17,300
Total Effluent to Arthur Kill at No. 1 Dam (4)	206.0	11	2270	18	30,900	42	72,200
Target Effluent Quality - End of 1969	206.0	5	1030	8	13,800	15	25,800

Notes:

(1) Water Quality data shown are net contributions of Refinery and Chemical Plant. Pollutants in the influent water have been deducted from measured effluent quality.

(2) TOC = Total Organic Carbon

(3) BOD = 5 day Biochemical Oxygen Demand

(4) Quantity of pollutants in total effluent is less than sum of the three primary sources due to evaporation and oil skimming above No. 1 Dam.

RHLarrabee/mbh
February 3, 1967
Bayway Refinery

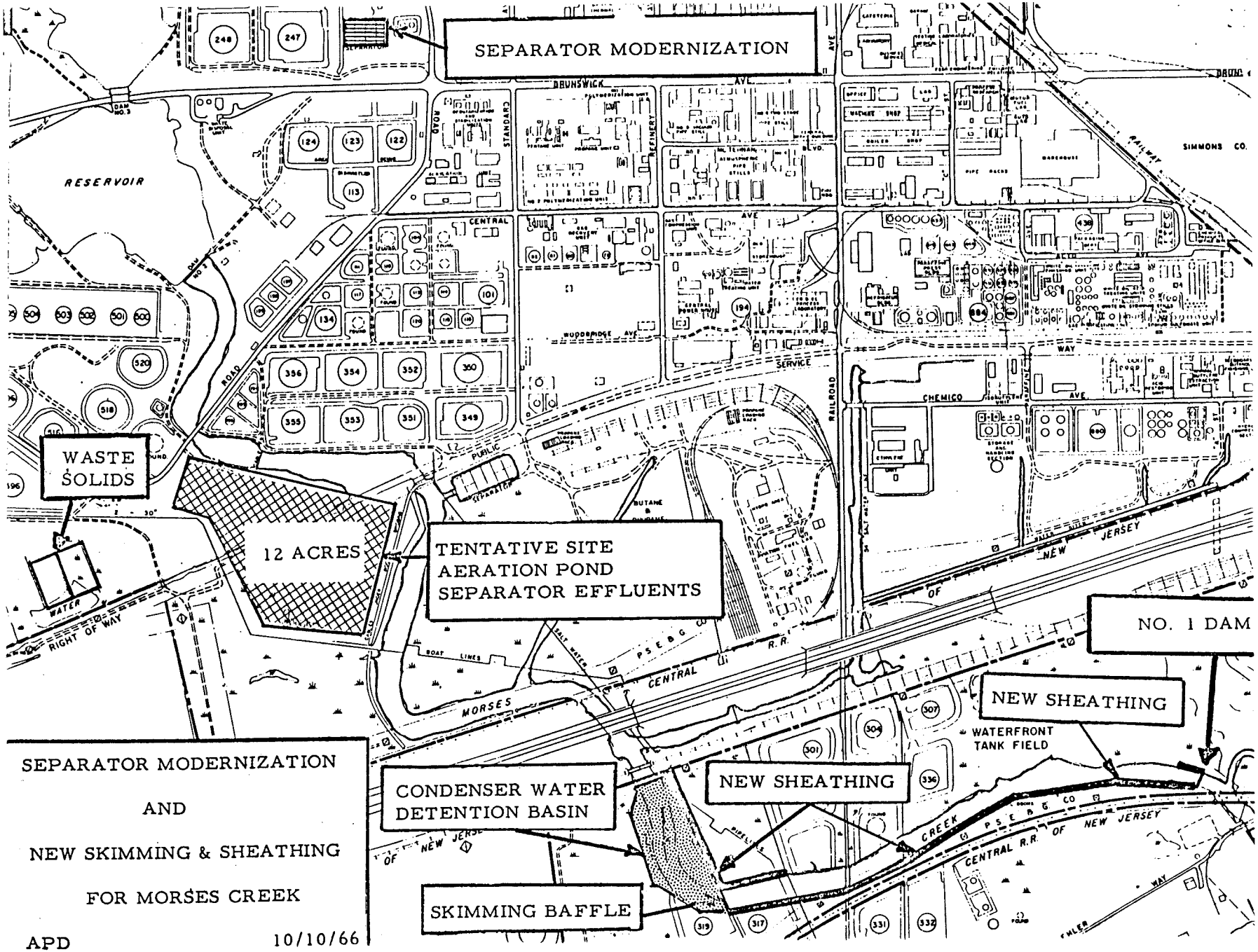
Table II

Forecasted Quality Bayway Effluent-Net Contribution

	OIL		BOD		TOC		PHENOL	
	ppm	lbs/day	ppm	lbs/day	ppm	lbs/day	ppm	lbs/day
Current Quality 1966 Avg. Net Contribution of Pollutants	11.0	18,700	42.0	71,500	18.0	30,600	2.7	4,600
Anticipated Improvement from:								
Spent Caustic - 1966 Budget	1.0	1,700	1.8	3,050	0.8	1,350	2.2	3,800
Quality after 1966 Project	10.0	17,000	40.2	68,450	17.2	29,250	0.5	800
Forecasted Improvement:								
Separator Modernization 1967 Budget Addition	1.0	1,700	1.8	3,050	0.8	1,350		
B.I. 67-70								
Part A	1.0	1,700	1.8	3,050	0.8	1,350		
Part B (1)								
Part C (2)								
Part D	0.5	850	0.9	1,525	0.4	675		
Chem Plant Projects								
NP/NPS - Improve							0.5	800
EBW-Oil to Refinery Sep.	0.5	850	0.9	1,525	0.4	675		
EBW-Sour H_2O (3)								
E.S.C.P. Segregation & Treatment	0.5	850	9.2	15,650	4.0	6,800		
Quality after Separator Modernization, B.I. 67-70, and Chem Plant Projects	6.5	11,050	25.6	43,650	10.8	18,400		
Forecasted Improvement:								
Secondary Treatment	3.0	5,100	10.6	18,150	3.3	5,600		
Projected (4) Long Range Quality	3.5	5,950	15.0	25,500	7.5	12,800	-	-

(1) Facilities required to prevent upset conditions when it rains. No daily improvement.
(2) Proposed sheathing is primarily good housekeeping rather than day-to-day effluent improvement.
(3) No valid basis to determine effect at No. 1 Dam-Project consistent with overall program.
(4) Values are not strictly additive, so that predicting projects effects are severely limited. Long range qualities represent best judgment at present.

APDennis/mbh - Feb. 3, 1967 - Bayway Refinery



SEPARATOR MODERNIZATION

AND

NEW SKIMMING & SHEATHING

FOR MORSES CREEK

APD 10/10/66

WHEREAS, The State Depart[illegible]te of New Jersey has found through inves[illegible] determinatives that the industrial wast[illegible]tter is being discharged into the Arthur Kill [illegible] of this State, from the industrial plant operated by the Humble Oil and Refining Company, in the City of Linden, County of Union and State of New Jersey, and that the said discharge is polluting the said waters of this State in such a manner as to cause or threaten injury to the inhabitants of this State either in their health, comfort or property; therefore

NOTICE IS HEREBY GIVEN, by the State Department of Health of the State of New Jersey pursuant to the applicable provisions of R.S. 58:12-2 to the Humble Oil and Refining Company, in the City of Linden, County of Union and State of New Jersey, requiring that the said Humble Oil and Refining Company must and shall, prior to January 27, 1964, cease such pollution of the Arthur Kill, being waters of this State, and make such disposition of its industrial waste or other polluting matter in a manner as shall be approved by the State Department of Health of the State of New Jersey.

STATE DEPARTMENT OF HEALTH OF THE STATE OF NEW JERSEY

Roscoe F. Kandle, M.D.
State Commissioner of Health

Dated: January 22, 1963

FEB 7 19

...of which the
...herewith admitted
...y of January, A.D., 1963.

...& REPORTING COMPANY

By T. J. Sheridan

CENTRAL JERSEY REGIONAL AIR POLLUTION CONTROL AGENCY

655 AMBOY AVENUE
WOODBRIDGE, NEW JERSEY 07095
TELEPHONE: (201) 634-0290

RECEIVED
FEB 24 1976
BOARD OF HEALTH

February 20, 1976

Mr. Henry Gavan
Health Officer
Linden Department of Health
City Hall
301 North Wood Avenue
Linden, New Jersey 07036

Re: Exxon Refinery Study, Linden

Dear Henry:

Enclosed please find the information contained in the study by the Council on Economic Priorities about the Linden Refinery.

If you would like any further information regarding the study, please let me know.

Sincerely yours,

Stanley J. Rogaski

STANLEY J. ROGASKI
Assistant Director

SJR:kaw

Enclosure

WATER POLLUTION INVENTORY (continued)

Water Pollutants	Gross Discharge (lbs/day)	Net Discharge (lbs/day)	Capacity Adjusted Net Discharge (lbs/1,000 bbl)	CEP Evaluation
BOD	340	287	6.38	B
COD	832	707	15.70	A
TOC	—	---	—	—
TSS	266	−365	− 8.1	—
Oil & Grease	361	279	6.20	C
Ammonia	48.3	37.6	0.84	A
Phenol	1.14	1.14	0.03	A
Chromium	0.09	-- 0.35	− 0.01	A

Data Sources—Air: US EPA, National Emissions Data System; Yellowstone County Air Pollution Control Agency; and Exxon.
Water: Intake—Army Corps of Engineers, Refuse Act Permit Application, 1971. New intake values for phenol and BOD supplied by Exxon.
Discharge—NPDES, Discharge Monitoring report August 1973 to December 1973 for process water only.

LINDEN

Capacity (1,000 bbl/calendar day): 265
Operations began: 1909
Number of employees: 1600

Exxon's refinery at Linden, New Jersey is the largest on the East Coast. The refinery discharges its wastewater to the heavily polluted Arthur Kill, the estuary that separates New Jersey from Staten Island. Linden's discharge contains large amounts of all the water pollutants, especially BOD and ammonia. Only phenol is relatively well controlled. Although Exxon installed an activated sludge system at Linden in 1970, a lack of good in-plant control has kept the system from performing properly. The nearby Exxon Chemical Company petrochemical plant contributes 28% of the wastewater flow to the refinery's treatment system (48).

Linden's air pollution performance is mediocre, but after the completion of an extensive pollution control program in 1976, the refinery's emissions of particulate and SOx should decrease substantially. Major reductions in hydrocarbon and CO emissions will probably have to await an effective enforcement program on the part of New Jersey.

Exxon operates a very large, 130,000 bbl/d, FCC at Linden (49). In 1973, this FCC was the source of most of the refinery's particulate and about 25% (11 T/D) of its SOx emissions (50, 51). The FCC exceeded the allowable emissions of these two pollutants under New Jersey regulations.

At present, external cyclones are the only particulate control equipment at the FCC (11), but Exxon promised in a November 1973 agreement with the New Jersey Department of Environmental Protection (NJDEP) to install a wet scrubber to reduce FCC particulate emissions by 31 July 1975. Exxon told CEP that the Linden scrubber would cost $16 million and cut FCC particulate emissions to less than half a ton daily (11). Construction has fallen behind schedule; Exxon attributes the delay to unavailability of needed equipment (52). The company and the NJDEP amended their agreement to extend the deadline to 15 February 1976 (53).

Although the FCC scrubber, which is similar to those under construction at Baytown and Baton Rouge, can control SOx as well as particulate emissions, Exxon has also attacked its SOx pollution problem at the cracker by removing sulfur from the feed to the FCC. Under the terms of a court order, Exxon agreed to install a second hydrodesulfurization unit to further reduce the sulfur content of the FCC feed by 31 October 1974. This project also ran into delays, forcing the deadline back to 28 February 1975 (52). Exxon met this deadline (52), and the second hydrodesulfurizer should have cut FCC SOx emissions by 5 or 6 T/D (51). Exxon claims that with hydrotreaters and scrubber operating, FCC SOx emissions will fall to less than 2.5 T/D (11).

Linden's two sulfur recovery plants were installed in 1969. They can recover 220 tons of sulfur daily. An additional 155 T/D of sulfur recovery capacity is being added along with a tail gas treatment unit. According to Exxon, the sulfur plants now release 8.6 tons of SOx into the air each day, but after their expansion and the addition of the tail gas unit in May 1975, those emissions will decrease to less than one ton a day (11). Linden produces up to 46,000 bbl/d of asphalt, more than any other US refinery (3). Asphalt usually has a high sulfur content of several per cent, and Bayway's crude contains less than 1% sulfur, so roughly half the sulfur that enters the refinery could leave in the asphalt.

On almost 90% of the days from April through December of 1972, the most recent period for which data is available, the National Air Quality Standard for hydrocarbon was exceeded at Elizabeth, New Jersey—about three miles northeast of the Linden refinery (54). The refinery's contribution to this pollution is substantial; at almost 60 T/D, it comprises about 5% of the total hydrocarbon emissions from all sources, including automobiles in the New Jersey portion of the New Jersey-New York-Connecticut Air Quality Control Region (55). Hydrocarbon and CO emissions have not been regulated effectively in New Jersey. The state still had no federally approved implementation plan for the control of these pollutants as late as March 1975 (56).

Since about 1970, the refinery has installed floating roofs on 11 crude oil and gasoline tanks. Four more floating roofs are under construction (57). According to Exxon, all of the gasoline and almost all of the crude oil at Linden are now kept in floating roof tanks (11). CEP was not able to determine whether Exxon has made substantial reductions in hydrocarbon emissions from refinery processes in recent years.

In 1965, the Linden refinery was the largest industrial polluter of the Arthur Kill, an estuary the National Estuarine Pollution Study recently classified as a "petrochemical estuary (58)." New Jersey calls it useful for navigation but not for recreation. The US Department of Interior published a report in 1967, based on 1965 data, which showed that 54% of the BOD load on the Kill came from 21 industries and three power generating stations. The Kill was receiving more than 100,000 lbs/day of BOD, 20,000 lbs/day of oil and 8,000 lbs/day of phenol. The study reported that Exxon at Linden was responsible for 46,920 lbs/day of BOD and 15,000 lbs/day of oil. At that time, the refinery did not treat its discharge other than to recover valuable oil by gravity separation (59).

New Jersey has required 80% BOD removal from the raw wastes discharged to the Arthur Kill since 1965 or 1966 (60), but apparently nothing was done at Linden until October 1968 when the refinery received a compliance schedule to build secondary treatment facilities (61).

In August 1970, the refinery began to operate an activated sludge unit, which consists of two aerated lagoons with secondary clarifiers. The plant cost around $5 million (62). Linden also improved its oil-water separators. The refinery's performance in 1974 is still poor, especially for BOD, TSS, and ammonia.

To Exxon's credit, the refinery uses surface condensers rather than barometric. However, Linden uses approximately 189 million gallons a day of once-through cooling water. A 22 September 1973 infra-red overflight of the Arthur Kill in the vicinity of the Exxon discharge indicated a possible violation of the New Jersey Water Quality Standards. Thermal pollution standards allow no discharge which would raise the temperature of the receiving water above 85 °F or which would cause the monthly mean of the maximum daily temperature to be exceeded by more than 4 °F from June through August (63, 64).

Linden discharges to Morse's Creek one mile above the point where it empties into the Arthur Kill. Legally, the state should control the temperature discharge at the refinery outfall. However, since in dry weather the water in Morse's Creek comes almost entirely from the refinery, temperature readings were taken at the Kill (65). Even there, the Exxon discharge is 100°F—about 27°F hotter than the intake. Where the refinery should measure both temperature and other pollutant parameters has been a point of contention for several years. Naturally, after travelling a mile down Morse's Creek, the effluent is cooler than it is at the eight outfall pipes into the Creek. In March 1975, a public hearing was held to consider where the refinery outfall should be monitored and regulated, but CEP was unable to learn the results of the hearing. If Exxon must monitor its effluent at the outfalls, it will need to improve its treatment system considerably. As it is, the refinery is now under a December 1974 compliance schedule which calls for additional treatment equipment (63).

On June 5, 1972, Linden discharged sulfur into Morse's Creek (66). According to Exxon, "Bayway [Linden] paid a $1,000 fine for this occurrence, which resulted when a sour water stripping unit came down unexpectedly. In May 1974 we placed an additional stripper in service to prevent this happening in the future (7)." Exxon expects this additional stripping capacity to also reduce the high ammonia discharge. Exxon cites 1973 data that show Linden had an ammonia discharge of 5,050 lbs/day, and after the addition of the stripper, the discharge was reduced to 1,000 lbs/day (7). CEP's refinery data reflect the older figure, 5,805 lbs/day gross.

LEGAL STATUS

Exxon must complete installation of an FCC scrubber by 15 February 1976.

The Linden refinery received an NPDES permit on 31 January 1975, and has requested an adjudicatory hearing to contest elements of the permit.

DATA SUMMARY

Percentage of products produced in 1974

Motor gasoline: —% Intermediate products: —% Residuals: —%

Major processes: Fluid catalytic cracking, hydrotreating, catalytic reforming, sulfuric acid alkylation, petrochemicals

Crude sulfur content: 0.9% Average sulfur intake (tons/day): 370

Sulfur recovery capacity (tons/day): 220

TOTAL REFINERY ENERGY USE

Source	Energy (equivalent bbl/day)
Coke	7,800
Fuel Oil }	8,200
Fuel Gas }	
Electricity	*
TOTAL	—

ESTIMATED SO_2 EMISSIONS FROM FUELS

	Sulfur (% by weight)	SO_2 Released (tons/day)
Coke	—	—
Fuel Oil	—	8.6
Fuel Gas	0.35	—
TOTAL	—	8.6

* 77% of electricity and 60% of steam are purchased

WATER TREATMENT

Process Water Treatment: Sour water strippers, API separators, activated sludge plant (aeration lagoon and two clarifiers).

Cooling Systems: Once-through—90%; Air and Recycle—10%

Sludges	Amount (lbs/day)	Disposed By
Spent acid sludge	240,000	Recovered
Separator	6,000	Aerobic digestion-land farming
Activated sludge	6,000	Concentrated landfill (in 1975-76)
Clay fines	4,000	Landfill
Catalyst fines	8,000	Landfill

AIR POLLUTION INVENTORY

Data for year: 1974 Jurisdiction: New Jersey Department of Environmental Protection
Capacity for that year (1,000 bbl/day): 225

Air Pollutants	Emissions (tons/day)	Capacity Adjusted Emissions (tons/1,000 bbl)	CEP Evaluation
Particulate	7.2	0.026	C
SOx	40	0.147	C
Hydrocarbon	60	0.216	C
NOx	11	0.040	—
CO	33	0.119	C

WATER POLLUTION INVENTORY

Intake data for year: 1973 US EPA, Region II; New Jersey Department of Environmental Protection Discharge data for year: 1973
Capacity for year of discharge data (1,000 bbl/day): 275

Intake (source)	Flow (million gal/day)	Discharge (receiving body)	Flow (million gal/day)
Arthur Kill	173.0	Morse's Creek (Arthur Kill)	174
Well	0.8		
Municipal	0.7		

	Intake	Discharge
Flow (ave. in million gal/day)	174.5	174
Temperature (Winter °F)	43	57
Temperature (Summer °F)	73	85
pH units	7.1	7.2

Water Pollutants	Gross Discharge* (lbs/day)	Net Discharge (lbs/day)	Capacity Adjusted Net Discharge (lbs/1,000 bbl)	CEP Evaluation
BOD	23,219	14,487	52.7	F
COD				—
TOC	29,023	8,648	31.5	—
TSS	101,581	14,261	51.9	—
Oil & Grease	4,353	1,442	5.24	C
Ammonia	5,805	4,350	15.8	F
Phenol	56.6	10	0.04	A
Chromium	224.67	3	0.01	A

*28% of wastewater treated at the Linden plant comes from Exxon Chemical

Data Sources: Air: U.S. EPA, National Emissions Data System
Water Intake and Discharge: National Pollutant Discharge Elimination System, Permit Application 1973, U.S. EPA, New York

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Mr. H. G. Taylor

(1)

A00534

ATTACHMENT B

OIL CONSERVATION DIVISION
BAYWAY REFINERY

March 24, 1960

Visit of Harbor Inspector - March 15, 1960

STRICTLY CONFIDENTIAL

FILE MEMORANDUM

Mr. Joseph Pollock, a field inspector from the New York Harbor Inspector's Office, visited the Bayway waterfront area in the vicinity of our Bridge Boom on Tuesday, March 15. At the time of his visit, our effluent into the Arthur Kill was heavily covered with oil and a very bad pollution situation existed. Laboratory analysis of our effluent (spot sample) at this time indicated 725 ppm hydrocarbon. By taking into account the effluent water rate, we were putting into the Arthur Kill 2,900 bbls./day at the time of the sample. On the basis of visual inspection alone, this high pollution rate does not seem out of line. (The Harbor Inspector's Office does not have the preceding effluent quality data.)

Mr. Pollock arrived at the waterfront without prior notification of anyone in the refinery. In fact, he notified the writer at the time of our discussion on March 15 that he had visited our plant on the preceding morning, Monday, March 14, and during the 3-1/2 hours of his stay at the Bridge Boom on Monday (10:00 AM to 1:30 PM), oil was going out into the Kill from behind the Bridge Boom, and pickup operations at the Bridge Boom pocket were inactive.

On the mornings of March 14 and 15, emergency maintenance repairs to the Bridge Boom were under way by personnel from Spearin, Preston and Burrows, Inc. Mr. Pollock was very angry indeed and indicated that as far as he was concerned the Harbor Inspector's Office was no longer to accept "excuses" from the Bayway Refinery in regard to its effluent or the condition of its facilities on Morses Mill Creek. He further indicated that our Boom facilities, in their opinion, were only temporary facilities at best, and did not, nor could not perform the job of providing a satisfactory effluent. In other words, our oil collection facilities were strictly of a temporary nature. He was very forceful in making comparisons between the relative size of our company and refinery and our apparent "lack of concern" about our effluent, since he could only judge our concern for effluent quality on the basis of physical facilities we use to collect oil from the Creek. He made the following remarks:

> "Here you have a hundred-million-dollar refinery, with up-to-date manufacturing equipment, and yet you only have a floating log to prevent oil from leaving your property into the Arthur Kill."

He also made a comparison between our facilities for pollution abatement and those of the Cities Service Oil Company at Linden. Needless to say, this comparison was far from complimentary.

Inspection of our separators, sewer systems, and the quality of the individual effluents which finally dump into the Morses Mill Creek, following my run-in with the Harbor Inspector, disclosed that every major effluent, without exception, was heavily loaded with oil and that considerable quantities of emulsion existed throughout the entire refinery. Heavy oil or emulsion losses were noted at the following major points:

1. Overhead condenser sewers along the Railroad Avenue ditch.

2. Ethylene Unit effluent.

3. East Side Chem. Products ditch.

4. Combined West and No. 5 Pipe Still Separator effluents.

5. East Separator effluent.

6. Morses Mill Creek at and above No. 430 Boom.

7. Morses Mill Creek below No. 430 Boom and above Railroad Avenue condenser water ditch junction.

8. All the Lower Oil Booms.

9. Bridge Boom.

Other than the large quantities of oil throughout the entire sewer system, the largest single contributor to our poor effluent was the emulsified condition existing on Morses Mill Creek, from the vicinity of No. 2 dam all the way down to the Bridge Boom.

Hydrocarbon in the emulsified state has a strong tendency to carry under each of the collecting booms along the Creek and on this particular day, March 15, the booms acted as though they were screens. Data indicate that approximately 2,500 gals./day of 20° Baume caustic soda had been dumped into the sewer systems or Morses Mill Creek for a period of about two weeks prior to the inspector's visit. Normally, about 1,500 gals./day of equivalent 20° Baume caustic soda are dropped to the Creek. We believe that this abnormal caustic soda loading contributed to the emulsions and the severe recovery problem encountered. On the evening of March 15, 35,000 lbs. (approximately 2,500 gals.) of 76% - 60° Baume sulfuric acid were dropped through the East Separator and out into the Creek in an attempt to lessen the emulsion problems encountered. All-out policing action to eliminate hydrocarbon losses to the sewer systems and to divert the spent caustic soda streams from separator systems were immediately taken.

Some of the events which preceded or followed the March 15 date, that are believed to have had a bearing on the problems encountered with our especially poor effluent, are given chronologically on the attached sheet.

J. A. Space, Jr.

JAS/mr

Attachments

cc: Messrs. D. P. Bates
P. C. Billings
D. T. Gregg
F. H. Greene
G. M. Hartmann
J. Hooton
J. E. McGovney
H. G. Taylor
H. F. Timperman
F. A. Westphal
E. R. Wilkinson

NOTE TO CC'S

Attachments from Cracking and Light Ends, Oil Movement, and Refining Divisions are not included.

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EVENTS PERTAINING TO POOR ETHYLENE CONDITION ON MARCH 15, 1960

Date	Event
December 1959	Bridge Boom hanging up in guides approximately once a week. Mechanical work performed to correct; results not completely satisfactory.
January 1960	No. 5 Pipe Still Separator removed from service. West side channels cleaned into east side of Separator.
January 5, 1960	Snapout No. 19808 issued to repair Bridge Boom. Hanging condition mentioned earlier more prevalent.
February 10, 1960	No. 5 Pipe Still Separator cleaning (west channels) completed.
February 11, 1960	West Separator removed from service for mechanical work and cleaning. Influx diverted along with No. 5 Pipe Still influx through west side channels of No. 5 Pipe Still Separator. (No. 5 Pipe Still West Separator channels really loaded!)
February 1960 (late)	Caustic soda line at No. 1 Poly, which handles spent soda from Cat Light Ends, was broken and in need of repair. Cat Light Ends soda is normally sold for high cresylic and naphthenic acid content and is trucked from No. 1 Poly Plant. Spent soda can no longer be pumped to No. 1 Poly Plant due to line break; soda dumped every three to four days to Morses Mill Creek. The Cat Light Ends spent soda stream contains especially good emulsifying agents. Emulsions formed in turn are stabilized by caustic soda.
March 1, 1960	Hydrofiner treating 150 Neutral Oil. Must dump caustic soda through sewer system to No. 5 Pipe Still Separator (via West Separator inlet which was diverted through No. 5 Pipe Still Separator).
March 2, 1960	Mechanical Department unable to fix Bridge Boom and suggested outside help be secured.
March 3, 1960	Oil Conservation sought MHD assistance on Bridge Boom problem.
March 10, 1960	Spearin, Preston and Burrows, Inc. initiated work at Bridge Boom on Morses Mill Creek under annual diving contract. Work entailed water jetting accumulated silt from Boom guides and area directly below Boom, plus installation of "styrofoam" plank on underside of Boom.

one shot proposition
to pump at H.O. condenser.

Date	Event
March 14, 1960	New York Harbor inspector visits Bridge Boom area for the first time, 10:00 AM to 1:30 PM. Only activity noted was work by contractor.
March 15, 1960	Harbor inspector makes second visit to refinery. Effluent quality extremely poor. Spot sample showed 725 ppm hydrocarbon equivalent to 2,900 bbls./day of oil.
	Extensive activity undertaken to eliminate all oil loss sources and to divert caustic soda from the sewer systems which directly affect separator operations. 35,000 lbs. of 76% sulfuric acid purchased from General Chemical Company and dumped through East Separator.
	Mechanical priority was given to repair caustic soda line at No. 1 Poly Plant to eliminate the dumping of Cat Light Ends spent soda to Morses Mill Creek. (1,000 B/CD saving.)
March 18, 1960	No. 1 Poly caustic soda line repair finished.
	Bridge Boom repairs completed to Boom proper; however, we still need to change location of Baltimore skimmer.
March 21, 1960	Refinery effluent vastly improved. Top priority given to further improving effluent from all units throughout the refinery.

JAS/mr
March 24, 1960

Attachments - Reports from Cracking & Light Ends, Oil Movement, and Refining Divisions relative to poor conditions on Morses Mill Creek follow.

BAYWAY REFINERY

August 24, 1964

MEMORANDUM TO: ALL OPERATING PERSONNEL

On Tuesday, August 18th, members of [illegible] control agencies will be in our Refinery to sample our water effluent at No. 1 Pan.

In order to maintain the best possible conditions which currently are existing, all operating personnel are requested to refrain from dumping any materials, such as:

a. Water drawoff from tanks,
b. Line washes,
c. Equipment washes,
d. Spent acids,
e. Spent caustic,
f. Spent chemicals,
g. Chemical cleanings, and
h. Oily wastes

to any of the sewer systems, beginning 3-11 shift Sunday, August 16th, thru 7-3 shift Wednesday, August 19th.

Your cooperation in maintaining these restrictions for 64 hours will do much to present the best possible refinery appearance to these public officials during their period of sampling.

F.H. Greene

FHG:vr

Esso Standard Oil Co.

Ethels?