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SITE INSPECTION REPORT
CELLOFILM CORPORATION
45-5 CORNELIA STREET
NEWARK, ESSEX COUNTY, NEW JERSEY

CERCLIS ID No.: NJD000813451

VOLUME I OF I

EPA Contract No.: 68-W-00-121
W.O. No.: 20103.001.001.1078.00
Document Control No.: 20103.1078.761

January 2005

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:
Region 2 Site Assessment Team
Weston Solutions, Inc.
Edison, New Jersey 08837

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SUBMITTED BY:

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SAT Project Manager

Date 1/27/05

W. Scott Butterfield, CHMM
SAT Program Manager

Date 1/27/05

SITE SUMMARY

The Cellofilm Corporation (Cellofilm) site (CERCLIS ID No. NJD000813451) is located at 45-5 Cornelia Street in an industrial/commercial area of Newark, Essex County, New Jersey (Ref. 2, p. 1; 4, p. 3; 18). The site is bound to the north by Albert Avenue; to the east by Cornelia Street; to the south by a grocery store; and to the west by active railroad tracks. The site is currently used as an active parking lot for tractor trailers, flatbeds and equipment (Ref. 4, pp. 2-4; 27). Tax maps indicate that the site property is identified as Block 2452, Lot No. 24. According to the City of Newark Tax Assessor, the current owner of the property is Cellomer Corporation (Ref. 12, pp. 1-3). A review of the Comprehensive Environmental Response, Compensation and Liability Information System database (CERCLIS) indicates that the site is also known as Reichhold Chemical-T (Ref. 2, p. 2).

Between 1968 and 1984 Cellofilm conducted a product transportation operation on the property. Cellofilm transported nitrocelluose for Cellofilm's Wood-Ridge, New Jersey facility, alkyd resins for Cellomer Corporation, located on 46 Albert Avenue (immediately north of Cellofilm), and finished product for Polychrome in Yonkers, New York. Polychrome was reportedly a parent company for both Cellofilm and Cellomer (Ref. 6, p. 44). While Cellofilm was operating on the site property, small quantities of hazardous waste were generated when tank truck compartments were washed with various solvents to avoid cross contamination between the various products being transported. Solvents used as part of the tank washing process included acetone, n-butyl alcohol, di-n-octyl phthalate, ethyl acetate, methanol, methyl ethyl ketone, toluene, methyl isobutyl ketone, xylene, and di-butyl phthalate. Wastes were reportedly placed in drums and removed from the site within 90 days by an authorized waste hauler for proper disposal (Ref. 6, pp. 67, 73).

On 19 November 1980, Cellofilm applied for classification as a treatment, storage, or disposal facility (TSD) in accordance with the Resource Conservation and Recovery Act (RCRA). On 27 May 1981, the New Jersey Department of Environmental Protection (NJDEP) performed an inspection at the facility, and it was noted that a number of containers were rusted and some were leaking their contents onto the ground. These leaking wastes included alkyd resins and flammable blanket wash material. It was also noted that some containers were overfilled with waste resins which were leaking onto the soil (Ref. 6, pp. 41-46). As a consequence of this inspection, on 29 September 1981, the United States Environmental Protection Agency (EPA) Region II filed a Complaint, Compliance Order and Opportunity for Hearing against Cellofilm Corporation (Ref. 6, pp. 56-61). On 7 July 1982, Cellofilm refiled as a generator status facility after a review of their operations indicated that they were not operating as a TSD facility (Ref. 6, pp. 63-68). On 24 October 1983, Cellofilm Corporation was officially reclassified from a TSD facility to a generator facility (Ref. 6, pp. 70-71).

In 1984, Polychrome acquired the Cellofilm facility. Subsequently, in March 1989, Reichhold Chemical acquired Cellomer Corporation and as part of this acquisition, acquired both the facility located at 46 Albert Avenue as well as the facility formerly occupied by Cellofilm (i.e., 45-5 Cornelia Street). Reichhold continued the product transportation operation formerly conducted by Cellofilm until 1995, when the production plant located at 46 Albert Street was closed (Ref. 9). The

property located at 46 Albert Avenue is currently undergoing an investigation under the Industrial Site Recovery Act (ISRA); the former Cellofilm facility is not part of this investigation (Ref. 19).

In 1989, a Preliminary Assessment (PA) was conducted at the Cellofilm site by the NUS Corporation Region II Field Investigation Team (FIT) under contract to EPA. During this assessment, an off-site reconnaissance was conducted on 20 April 1989. During this reconnaissance, stains were observed on the sidewalk adjacent to a hazardous waste drum storage area (Ref. 6, p. 5). During this reconnaissance, a site sketch was drawn and photos were taken indicating staining on the sidewalk of Cornelia Street coming from the drum storage area of the facility. The Final Draft PA Report (dated 8 June 1989) included a recommendation for soil and air sampling (Ref. 6, pp. 2, 5, 13, 14). Further review of this investigation indicates that although background information obtained was for the Cellofilm facility, the off-site reconnaissance focused on the Reichhold Chemical facility located on 46 Albert Street; the property located at northwest quadrant of the Cornelia Street/Albert Avenue intersection (Ref. 6, pp. 18-24, 75-78).

In September 1993, a RCRA compliance evaluation was conducted at the Cellofilm facility by CDM Federal Programs Corporation under contract to EPA. When inspectors arrived, they noted that the location (i.e., 45-5 Cornelia Street) was occupied by Reichhold Chemicals, Inc. During this inspection, it was confirmed that 45-5 Cornelia Street was occupied by Cellofilm and that this parcel was the southwest quadrant of the Cornelia Street/Albert Avenue intersection. No areas of concern or potential violations were observed during this inspection (Ref. 13).

On 14 July 2003 and 28 September 2004, the Region 2 Site Assessment Team (SAT) conducted off-site reconnaissances of the former location of the Cellofilm Corporation site. The site was noted to be mostly paved with two structures; an office trailer and a garage. The site was noted to be currently used as a parking lot for trucks, flatbeds and equipment. No residences, schools, or day care centers were observed within 200 feet of the site boundaries (Ref. 4, pp. 2, 3; 27).

Based on previous observations of drum contents being released to the surrounding soil, there is a potential for on-site soil contamination and an impact to groundwater; however, there are no potable wells within the site's 4-mile target distance limit (Ref. 6, pp. 41-46; 7, pp. 1-19). Runoff from the site enters storm drains along Cornelia Street and Albert Avenue. These storm drains are reported to discharge to the Passaic River, which is a fishery located approximately 1,500 feet north of the site (Ref. 14; 21). There are no potable surface water intakes within 15 miles of the probable point of entry to surface water (Ref. 22). There are no sensitive environments in the vicinity of the site (Ref. 23; 24). Although there is suspected soil contamination due to previous spillage of drum contents, there are no soil exposure targets (i.e., residences, schools or day care centers) within 200 feet of the site. In addition, The site is noted to be mostly paved during the on-site reconnaissances conducted by Region 2 SAT (Ref. 4, pp. 2-3).

SITE ASSESSMENT REPORT: SITE INSPECTION

PART I: SITE INFORMATION

1. Site Name/Alias Cellofilm Corporation

   Street 45-5 Cornelia Street

   City Newark State New Jersey Zip 07105

2. County Essex County Code 13 Cong. Dist. 10
3. CERCLIS ID NO.: NJD000813451

4. Block No. 2448 Lot No. 29

5. Latitude 40° 44′ 12.1″ N Longitude 74° 08′ 15.0″ W

   USGS Quad(s). Elizabeth, NJ

6. Approximate size of site 1.24 acres

7. Owner Cellomer Corporation* (current) Telephone No. (919) 558-2356

   Street PO Box 13582

   City Research Triangle Park State North Carolina Zip 27709

   * - City of Newark Tax records indicate that the current owner is Cellomer Corporation; however, the address and phone number listed above were confirmed to be that of Reichhold Chemical.

7a Owner Polychrome (1984-1989) Telephone No. (919) 558-2356

   Street Unknown

   City Unknown State Unknown Zip Unknown

7b Owner Cellofilm Corporation (1968-1984) Telephone No. (919) 558-2356

Street 245 Union Avenue

City Wood-Ridge State New Jersey Zip 07075

8. Operator Lomma Trucks (current) Telephone No. Unknown

Street Unknown

City Unknown State Unknown Zip Unknown

9. Type of Ownership

X Private __ Federal __ State

__ County __ Municipal __ Unknown __ Other _____

10. Owner/Operator Notification on File

X RCRA 3010 see below Date

___ CERCLA 103c _____ Date

___ None _____ Unknown

On 19 November 1980, Cellofilm applied for classification as a treatment, storage, or disposal facility (TSD). On 7 July 1982, Cellofilm refiled as a generator status facility after a review of their operations indicated that they were not operating as a TSD facility. On 24 October 1983, Cellofilm Corporation was officially reclassified from a TSD facility to a generator facility.

11. Permit Information

Permit	Permit No.	Date Issued	Expiration Date	Comments
None	N/A	N/A	N/A	N/A

12. Site Status

___ Active X Inactive __ Unknown

13. Years of Operation: 1968 through 1995 (Cellofilm; Polychrome; Reichhold)

14. Identify the types of waste sources (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Sources

Waste Unit No.	Waste Source Type	Facility Name for Unit
1	Contaminated Soil	Contaminated Soil

b) Other Areas of Concern

The property located immediately to the north (i.e., 46 Albert Street) is currently undergoing an investigation under the Industrial Site Recovery Act; although Reichhold Chemical also owns the former Cellofilm site (i.e., 45-5 Cornelia Street), this property is not included as part of this investigation.

Ref. 2; 3, pp. 3-4; 4, pp. 3-4; 5, p. 11; 6, pp. 3-6, 29-30, 64-67, 70-71; 9; 12, pp. 2-3; 13, p. 3

15. Describe the regulatory history of the site, including the scope and objectives of any previous response actions, investigations and litigation by State, Local and Federal agencies (indicate type, affiliation, date of investigations).

- **Notification of Hazardous Waste Activity (Acknowledgment)** - filed by Cellofilm Corporation; submitted to EPA in accordance with Section 3010 of RCRA, 20 August 1980 (Ref. 6, pp. 29-30).
- **Hazardous Waste Permit Application** - filed by Cellofilm Corporation outlining the process and wastes associated with the facility and indicating that the facility treat, stores, and disposes of hazardous waste , 19 November 1980 (Ref. 6, pp. 32-39).
- **RCRA Generator Inspection Form** - Completed by NJDEP which identified leaking drums of resin, waste oil, and sludge on soil and gravel. The inspector noted several action items that Cellofilm should achieve in order to comply with existing state and federal regulations including repacking all leaking drums and cleaning up spilled sludge and resin in contact with the ground surface, 27 May 1981 (Ref. 6, pp. 41-46).
- **Complaint, Compliance Order, and Notice of Opportunity for Hearing** - Issued by the EPA and proposed a civil penalty of 14,000 dollars for violations of 40 CFR 265.173(b). Violations were revealed during the May 27 1981 RCRA Inspection during which at least two containers were observed to be overfilled with waste resins which were leaking onto the soil, 29 September 1981 (Ref. 6, pp. 56-61).
- **Notification of Hazardous Waste Activity (Subsequent Notification)** - The subsequent notification of hazardous waste activity lists the facility as a generator. Originally the facility filed as a generator, transporter, and treatment storage and disposal facility. Also

the subsequent notification of hazardous waste activity included three substances in the hazardous substances section while the original included nine, 28 June 1982 (Ref. 6, pp. 64 -67).

- **Letter from the NJDEP** - The Bureau of Hazardous Waste Engineering accepts the reclassification of the Cellofilm facility from a hazardous waste treatment, storage, or disposal facility to "generator only" status, 24 October 1983 (Ref. 6, pp. 70-71).
- **Final Draft Preliminary Assessment for Cellofilm Corporation** - Completed by NUS at the Cellofilm Corporation; during which a site sketch was drawn and photos were taken indicating staining on the sidewalk of Cornelia Street coming from the drum storage area of the facility, PA Report (dated 8 June 1989) included a recommendation for soil and air sampling (Ref. 6, p. 5). Further review of this investigation indicates that the off-site reconnaissance was conducted at the Reichhold Chemical facility located at the northwest quadrant of the Cornelia Street/Albert Avenue intersection (Ref. 6, pp. 75-78).
- **Compliance Evaluation Inspection (CEI) for Cellofilm Corporation -** Location Now Occupied by Reichhold Chemicals, Inc. - Completed by CDM Federal Programs Corporation under RCRA including a site inspection conducted on 24 September 1993. No areas of concern or potential violations were observed during this inspection (Ref. 13).

a) Is the site or any waste source subject to Petroleum Exclusion? Identify petroleum products and by products that justify this decision.

During the 27 May 1981 NJDEP inspection, a 55-gallon drum of waste oil was observed. The contents of the drum was described as crankcase oil from Cellofilm's vehicles. NJDEP instructed Cellofilm to remove the drum utilizing a registered special waste hauler. During the Region 2 SAT off-site reconnaissance, neither the site nor any waste sources were observed to be subject to Petroleum Exclusion provisions.

Ref. 4, pp. 1-4; 6, p. 45

b) Has normal farming application of pesticides registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) occurred at the site? Have pesticides been produced or stored at the site? Have there been any leaks or spills of pesticides on site?

Based on available historical information, the site is not known to have been used for agricultural purposes. Therefore, pesticides regulated under FIFRA are not known to have been applied to the site.

Ref. 26

c) Is the site or any waste source subject to RCRA Subtitle C (briefly explain)?

On 19 November 1980, Cellofilm applied for classification as a treatment, storage, or disposal facility (TSD). On 7 July 1982, Cellofilm refiled as a generator status facility after a review of their operations indicated that they were not operating as a TSD facility. On 24 October 1983, Cellofilm Corporation was officially reclassified from a TSD facility to a generator facility. The site is currently used as a parking lot for trucks. Therefore, neither the site nor any waste source is subject to RCRA Subtitle C.

Ref. 6, pp. 35-39, 64-71; 4, pp. 1-4

d) Is the site or any waste source maintained under the authority of the Nuclear Regulatory Commission (NRC)?

A review of available background information indicates that neither the site nor any waste source is maintained under the authority of the NRC.

Ref. 26

16. Do any conditions exist on site which would warrant immediate or emergency action?

During the off-site reconnaissance conducted by Region 2 SAT, no conditions were noted which would warrant immediate or emergency action.

Ref. 4, pp. 1-4

17. Information available from:

Contact Denise Zeno Agency U.S. EPA Telephone No.: (212) 637-4319
Preparer Dennis Foerter Agency Region 2 SAT Date: January 2005

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following items.

Waste Unit 1 - **Potentially Contaminated Soil**

Source Type

_____Landfill	X Contaminated Soil
_____Surface Impoundment	_____ Pile
_____Drums	_____ Land Treatment
_____Tanks/Containers	_____Other

Description:

1. Describe the types of containers, impoundments, or other storage systems (i.e., concrete - lined surface impoundments) and any labels that may be present.

   On 27 May 1981, the NJDEP performed an inspection at the facility. During this inspection, it was noted that a number of containers were leaking their contents onto the ground. These leaking wastes included alkyd resins, waste oil sludge, and flammable blanket wash material. It was also noted that some containers were overfilled with waste resins which were leaking onto the soil. Neither Cellofilm or Reichhold Chemical currently operate their produce transportation operation on the site property; the property is currently used as a parking lot for trucks; drum storage areas no longer exist. Therefore, potentially contaminated soil is evaluated as the waste source for the Cellofilm site.

   Ref. 4, pp. 1-4; 6, pp. 41-46

2. Describe the physical condition of the containers or storage systems (i.e., rusted and/or bulging drums).

   During the 27 May 1981 inspection conducted by NJDEP, it was noted that a number of containers were rusted with some were leaking their contents onto the ground. It was also noted that some containers were overfilled with waste resins leaking onto the soil.

   Ref. 6, pp. 41-46

3. Describe any secondary containment that may be present (e.g., drums on concrete pad in building or aboveground tank surrounded by berm).

   There are no known containment features associated with potentially contaminated soil on site

   Ref. 6, pp. 41-46

Hazardous Waste Quantity

The areal extent of contaminated soil (if any) is unknown; during the 27 May 1981 NJDEP inspection, it was noted that waste resins and waste oil sludge spilled onto a 5-foot by 10-foot area of soil and gravel. Therefore, a hazardous waste quantity of 50 square feet of contaminated soil is evaluated for the Cellofilm site.

Ref. 6, p. 45

Hazardous Substances/Physical State

Contaminants used as part of the tank washing process include acetone, n-butyl alcohol, di-n-octyl phthalate, ethyl acetate, methanol, methyl ethyl ketone, toluene, methyl isobutyl ketone, xylene, and di-butyl phthalate. These contaminants were previously used in a liquid form.

Ref. 6, p. 73

PART III. SAMPLING RESULTS

EXISTING ANALYTICAL DATA

A review of background information indicates that no sampling activities have been conducted at the Cellofilm site.

SITE INSPECTION SAMPLING RESULTS

No samples were collected by Region 2 SAT during the Site Inspection (SI) evaluation of the Cellofilm site. Based on a review of available background information and the additional Hazard Ranking System (HRS)-relevant information collected during the SI evaluation, it was determined that further sampling was not necessary to characterize the site.

PART IV: HAZARD ASSESSMENT

GROUNDWATER ROUTE

1. **Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release, define the supporting analytical evidence and relationship to background.**

   In May 1981, the NJDEP noted that containers were rusted with some leakingtheir contents onto the ground. Wastes included alkyd resins and flammable blanket wash material. It was also noted that containers, overfilled with waste resins, were leaking onto the soil. Available background information indicates that there are no monitoring wells on site and no groundwater samples have been collected in association with the site. Based on the previous spillage of drum contents directly onto soil, a release of contaminants to groundwater is suspected. There are no potable wells within 4 miles of the site.

   Ref. 6, pp. 41-46, 7, pp. 1-19

2. **Describe the aquifer of concern; include information such as depth, thickness, geologic composition, areas of karst terrain, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

   The aquifer of concern is the Passaic Formation (a.k.a. Brunswick Formation) which forms the bedrock throughout the Newark area. The Passaic Formation is described as being composed of red shale with some sandstone, siltstone, conglomerate, basalt, and diabase. The thickness of the Passaic Formation is variable but is estimated to be as high as 11,810 feet. Groundwater flow is through joints and fractures of the consolidated rock. The direction of highest permeability and of the greatest movement of water in response to pumping tends to parallel the strike of the beds, generally southwest to northeast.

   The Passaic Formation is overlain by Pleistocene deposits of glacial origin. These deposits consist of an unconsolidated, unstratified, heterogeneous mixture of clay, boulders, and sand (i.e., till); and, stratified glacial drift, which is composed of sand and gravel. The thickness of these deposits in the area of the site is estimated to be 50 feet. The estimated permeability of the overburden is 10^{-4} to 10^{-6} centimeters per second (cm/s). The depth to groundwater in the area of the site is approximately 4 feet.

Surficial deposits in the Newark area are reported to be commonly in direct hydraulic connection with the underlying bedrock and adjacent streams, rivers, and lakes; therefore, the Pleistocene deposits and underlying bedrock will be evaluated as one hydrogeologic unit for the purposes of this report.

Ref. 6, pp. 117-118; 10, p. 11; 11, pp. 10-11; 19, p. 3

3. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

Based on the fact that drums were observed to be leaking contents onto site soil in 1981, the depth of the lowest point of waste disposal/storage is the ground surface (i.e., 0 feet). The depth to the highest seasonal level of the aquifer of concern estimated to be 4 feet. Therefore, the depth from the lowest point of waste disposal/storage to the highest seasonal level of the aquifer of concern is estimated to be 4 feet.

Ref. 1, p. 3; 6, pp. 41-46; 19

4. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the top of the aquifer of concern?**

The permeability value of the least permeable continuous intervening stratum (i.e., Pleistocene deposits) between the ground surface and the top of the aquifer of concern is 10^{-4} to 10^{-6} cm/s.

Ref. No. 1, p. 4; 10, p. 11

5. **What is the net precipitation at the site (inches)?**

The net precipitation at the site ranges from 15 to 30 inches.

Ref. 1, pp. 2, 3.

6. **What is the distance to and depth of the nearest well that is currently used for drinking purposes?**

Available background information indicates that the nearest well currently used for drinking purposes is outside of the site's 4-mile target distance limit.

Ref. 7

7. **If a release to groundwater is observed or suspected, determine the number of people that obtain drinking water from wells that are documented or suspected to be actually contaminated by hazardous substance(s) attributed to an observed release from the site.**

There are no potable wells within the site's 4-mile target distance limit.

Ref. 7, pp. 1-19

8. **Identify the population served by wells located within 4 miles of the site that draw from the aquifer of concern.**

Distance	Population
0 - ¼ mile	0
>¼ - ½ mile	0
>½ - 1 mile	0
>1 - 2 miles	0
>2 - 3 miles	0
>3 - 4 miles	0

There are no known potable wells within the site's a 4-mile target distance limit.

Ref. 7, pp. 1-19

State whether groundwater is blended with surface water, groundwater, or both before distribution.

Not applicable; groundwater is not used for potable purposes within 4-miles of the site.

Ref. 7, pp. 1-19

Is a designated wellhead protection area within 4 miles of the site?

There are no designated wellhead protection areas (WHPAs) located within 4 miles of the site.

Ref. 20

Does a waste source overlie a designated or proposed wellhead protection area? If a release to groundwater is observed or suspected, does a designated or proposed wellhead protection area lie within the contaminant boundary of the release?

Not applicable; There are no designated wellhead protection areas (WHPAs) located within 4 miles of the site.

9. **Identify one of the following resource uses of groundwater within 4 miles of the site (i.e., commercial livestock watering, ingredient in commercial food preparation, supply for commercial aquaculture, supply for major, or designated water recreation area, excluding drinking water use, irrigation (5-acre minimum) of commercial food or commercial forage crops, unusable).**

Available background information does not indicated any resource uses of groundwater within the site's 4-mile target distance limit.

Ref. 7, pp. 1-19

SURFACE WATER ROUTE

10. Describe the likelihood of a release of contaminant(s) to surface water as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release, define the supporting analytical evidence and relationship to background.

A release of site-attributable contaminants to surface water is not observed or suspected. Runoff from the site flows to storm sewer drains located along adjacent roadways (i.e., Cornelia Avenue and Albert Avenue). These storm drains are reported to lead to the Passaic River at a point approximately 1,500 feet due north of the Cellofilm facility. There is no current hazardous waste activity on site. Based on the fact that the site is located in a heavy industrial area, documenting a release of contaminants, attributable to previous potential releases from the Cellofilm site, to surface water is unlikely.

Ref. 4, pp. 2, 3; 14; 21

11. Identify the nearest down slope surface water. If possible, include a description of possible surface drainage patterns from the site.

The nearest downslope surface water is the Passaic River, located approximately 1,500 feet north of the Cellofilm facility. Runoff from the site is expected to enter storm drains located on Cornelia Street and Albert Avenue; these storm drains are reported to lead to the Passaic River. The probable point of entry (PPE) to surface water is the portion of the Passaic River north of the Cellofilm facility. The in-water segment extends from the PPE along the Passaic River to the east and then south where the Passaic River enters the Newark Bay. The in-water segment continues south through the Newark Bay where it splits approximately 8 miles downstream of the PPE. The western portion extends south and ends in the Arthur Kill. The eastern portion extends east through the Kill Van Kull and then splits again, approximately 12 miles downstream of the PPE. The eastern portion of the surface water migration pathway ends to the north in the Upper Bay and to the south in The Narrows.

Ref. 14; 21

12. What is the distance in feet to the nearest down slope surface water? Measure the distance along a course that runoff can be expected to follow.

The nearest downslope surface water is the Passaic River, located approximately 1,500 feet north of the Cellofilm site.

Ref. 14; 21

13. Identify all surface water body types within 15 downstream miles.

Name	Water Body Type	Flow (cfs)	Saline/Fresh/Brackish
Passaic River	Coastal Tidal Water	NA	Saline
Newark Bay	Coastal Tidal Water	NA	Saline
Arthur Kill	Coastal Tidal Water	NA	Saline
Kill Van Kull	Coastal Tidal Water	NA	Saline
Upper Bay	Coastal Tidal Water	NA	Saline
The Narrows	Coastal Tidal Water	NA	Saline

Ref. 21

14. Determine the 2-yr, 24-hr rainfall (inches) for the site.

The 2-year, 24-hour rainfall for the site is approximately 3.25 inches.

Ref. 15

15. Determine size of the drainage area (acres) for sources at the site.

The exact location of the leaking drums and potentially contaminated soil is not indicated in available background information. Runoff from the site is intercepted by storm drains located on Cornelia Street and Albert Avenue. Therefore, the drainage area of the site will be evaluated as 1.24 acres; the size of the site property.

Ref. 1, p. 5; 4; 12, pp. 2, 3

16. Describe the predominant soil group in the drainage area.

The site was observed to be mostly paved during the on-site reconnaissance conducted by Region 2 SAT. Therefore, the predominant soil group in the drainage area is evaluated as an impermeable surface (i.e., pavement).

Ref. 4, p. 5

17. Determine the type of flood plain that the site is located within.

The site is located between the 100-year and 500-year flood plains. It should be noted that the site is bordered to the west by a zone of minimal flooding. Also, the northeast portion of the site is bordered to the east by the 100-year flood plain.

Ref. 16

18. Identify drinking water intakes in surface waters within 15 miles downstream of the point of surface water entry. For each intake identify: the name of the surface water body in which the intake is located, the distance in miles from the point of surface water entry, population served, and stream flow at the intake location.

Intake	Distance	Population Served	Flow (cfs)
None	NA	NA	NA

There are no potable surface water intakes within the 15-mile target distance limit.

Ref. 22

19. Identify fisheries that exist within 15 miles downstream of the point of surface water entry. For each fishery specify the following information:

Fishery Name	Water Body Type	Flow (cfs)	Saline/Fresh/Brackish
Passaic River	Coastal Tidal Water	NA	Saline
Newark Bay	Coastal Tidal Water	NA	Saline
Arthur Kill	Coastal Tidal Water	NA	Saline
Kill Van Kull	Coastal Tidal Water	NA	Saline
Upper Bay	Coastal Tidal Water	NA	Saline
The Narrows	Coastal Tidal Water	NA	Saline

Ref. 17; 21

20. Identify surface water sensitive environments that exist within 15 miles of the point of surface water entry.

Environment	Water Body Type	Flow (cfs)	Wetland Frontage (mi)
Five State-Designated Threatened Species Habitats	Coastal Tidal Water	NA	NA
One State-Designated Endangered Species Habitats	Coastal Tidal Water	NA	NA
Wetlands	Coastal Tidal Waters	NA	7.17

Ref. 21, 23, 24

21. If a release to surface water is observed or suspected, identify any intakes, fisheries, and sensitive environments from question Nos. 18-20 that are or may be actually contaminated by hazardous substance(s) attributed to an observed release of from the site.

A release to surface water is not observed or suspected; see Question No. 10 for a description of the likelihood of a release.

22. Identify whether the surface water is used for any of the following purposes, such as: irrigation (5 acre minimum) of commercial food or commercial forage crops, watering of commercial livestock, commercial food preparation, recreation, potential drinking water supply.

A release to surface water is not observed or suspected; see Question No. 10 for a description of the likelihood of a release.

SOIL EXPOSURE PATHWAY

23. Determine the number of people that occupy residences or attend school or day care on or within 200 feet of observed contamination.

There are no residences, schools, or day care centers on or within 200 feet of potential observed soil contamination.

Ref. 4, p. 3

24. Determine the number of people that regularly work on or within 200 feet of observed contamination.

There are approximately 10 employees working on the former Cellofilm property.

Ref. 4, p. 5

25. Identify terrestrial sensitive environments on or within 200 feet of observed contamination.

There are no terrestrial sensitive environments on or within 200 feet of observed soil contamination.

Ref. 16

26. Identify whether there are any of the following resource uses, such as commercial agriculture, silviculture, livestock production or grazing within an area of observed or suspected soil contamination.

There are no resource uses of soil on or within 200 feet of observed soil contamination.

Ref. 4, pp. 3-5

AIR PATHWAY

27. Describe the likelihood of release of hazardous substances to air as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them the site. For observed release, define the supporting analytical evidence and relationship to background.

A release to air is not observed or suspected for the Cellofilm site. Bckground information does not indicate any air sampling activities having taken place on the site. During the on-site reconnaissances conducted by Region 2 SAT, the site was noted to be entirely paved.

Ref. 4, p. 5

28. Determine populations that reside within 4 miles of the site.

Distance	Population
On-site	0
>0 - ¼ mi	486
>¼ - ½ mi	3,855
>½ - 1 mi	11,568
>1 - 2 mi	68,877
>2 - 3 mi	112,818
>3 - 4 mi	253,168

Approximately 450,772 people reside within a 4-mile radius of the Cellofilm Corporation site.

Ref. 8

29. Identify sensitive environments, including wetlands and associated wetlands acreage, within 4 miles of the site.

Distance	Wetlands Acreage	Sensitive Environments
On-site	0	None identified.
0 - ¼ mi	0	None identified.
>¼ - ½ mi	1.64	None identified.
>½ - 1 mi	11.76	None identified.
>1 - 2 mi	473.54	One State-Listed Endangered Species Habitat.
>2 - 3 mi	901.01	None identified.
>3 - 4 mi	1,118.81	Three State-Listed Endangered Species Habitats Three State-Listed Threatened Species Habitats

There are 2,506.76 acres of wetlands within a 4-mile radius of the Cellofilm site.

Ref. 16; 23

30. If a release to air is observed or suspected, determine the number of people that reside or are suspected to reside within the area of air contamination from the release.

A release to air is not observed or suspected; see Question No. 27 for a description of the likelihood of a release.

31. If a release to air is observed or suspected, identify any sensitive environments, listed in question No. 29, that are or may be located within the area of air contamination from the release.

A release to air is not observed or suspected; see Question No. 27 for a description of the likelihood of a release.

DCN NO.: 20103.1078.761

ATTACHMENT 1

PHOTOGRAPH LOG

CELLOFILM CORPORATION
NEWARK, ESSEX COUNTY, NEW JERSEY

DCN NO.: 20103.1078.761

CELLOFILM CORPORATION
NEWARK, ESSEX COUNTY, NEW JERSEY

PHOTOGRAPH INDEX

All photographs taken by Michele Capriglione

Photo No.*	Description	Date
5	Block 4352, Lot 24; the former location of Cellofilm Corporation. Photo taken from Cornelia Street to the southwest.	9/28/04
4	View of central portion of the property. Photo taken from Cornelia Street toward the west.	9/28/04
6	View of the garage located in the central portion of the property.	9/28/04
8	View of dumpster located toward the southern portion of the property. Photo taken from Cornelia Street facing southwest.	9/28/04
9	View of Lomma flatbed trucks currently stored on the property. seen in foreground; garage and truckport seen in background. Photo taken facing southwest from the fence along the property on Cornelia Street.	9/28/04
17	View of grocery store located at Block 2452, Lot 26 adjacent to the south of the former Cellofilm Corportion.	9/28/04
10	View of the northern portion of the facility along fence line and railroad which borders the property to the west. Photo taken from Albert Avenue facing south.	9/28/04
13	View of fenced-in parking lot located at the northern portion of the property. Photo taken facing southeast toward Cornelia Street from Albert Avenue.	9/28/04
14	Photo of property adjacent to the north, Block 2448, Lot 29. The property also currently stores Lomma trucks and flatbeds. Photo taken from Albert Avenue facing north	9/28/04

* - Photo numbers correspond to photo numbers delineated in the site logbook (see Reference 4).

Photo log of the former location of the Cellofilm Corporation

Photo 5. Block 2452, Lot 24; the former location of Cellofilm Corporation. Photo taken from Cornelia Street toward the southwest.

Photo 4. View of the central portion of the property. Photo taken from Cornelia Street toward the west.

Photo 6. View of the garage located in the central portion of the property.

Photo 8. View of dumpster located toward the southern portion of the property. Photo taken from Cornelia Street facing southwest.

Photo 9. View of Lomma flatbed trucks currently stored on the property seen in the foreground; garage and truckport seen in the background. Photo taken facing northeast from the fence along the property on Cornelia Street.

Photo 17. View of the grocery store located at Block 2452, Lot 26 adjacent to the south of the former Cellofilm Corporation.

Photo 10. View of the northern portion of the facility along fence line and railroad which borders the properto to the west. Photo taken from Albert Avenue facing south.

Photo 13. View of the fenced in parking lot located at the northern portion of the property. Photo taken facing southeast toward Cornelia Avenue from Albert Street.

Photo 14. Photo of property adjacent to the north, Block 2448, Lot 29. The property also currently stores Lomma trucks and flatbeds. Photo taken from Albert Avenue facing north.

REFERENCES

1. Federal Register, 40 CFR, Part 300, Hazard Ranking System; Final Rule, Volume 55, No. 241, Environmental Protection Agency (EPA), 14 December 1990.

2. EPA, Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database, Cellofilm Corporation, accessed on 22 September 2004, http://cfpub2.epa.gov/supercpad/cursites/csitinfo.cfm?id=0202971.

3. Congressional District Atlas, 103rd Congress of the United States, Volume 2, U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census, February 1993.

4. Region 2 Site Assessment Team (SAT), Field Logbook No. SAT.078.001, Cellofilm Corporation, Off-site Reconnaissances conducted on 14 July 2003 and 28 September 2004.

5. Project Note from Michele Capriglione, Region 2 SAT, to Cellofilm Corporation file, Subject: Site Latitude and Longitude, 15 September 2004.

6. Final Draft Preliminary Assessment Report, Cellofilm Corporation, prepared by NUS Corporation for EPA, 8 June 1989.

7. Project Note from Michele Capriglione, Region 2 SAT, to Cellofilm Corporation File, Subject: Groundwater Population, 1 April 2004; with attachments.

8. Project Note from Michele Capriglione, Region 2 SAT, to Cellofilm Corporation File, Subject: Population Within 4 Miles of the Cellofilm Corporation site, 31 March 2004; with attachments.

9. Letter from John S. Connolly, Reichhold, Inc., to Program Administrator, New Jersey Department of Environmental Protection (NJDEP), 14 January 2000.

10. Herpers, Henry, and Barksdale, Henry C. Special Report 10: Preliminary Report on the Geology and Groundwater of the Newark, New Jersey Area, State of New Jersey, prepared for the Department of Conservation and Economic Development, Division of Water Policy and Supply in cooperation with the U.S. Department of the Interior, Geological Survey, 1951.

11. Project Note from Michele Capriglione, Region 2 SAT, to Cellofilm Corporation File, Subject: Site Geology, 1 April 2003; with attachments.

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13. Compliance Evaluation Inspection (CEI) Cellofilm Corporation (Location Now Occupied by Reichhold Chemicals, Inc.), prepared by CDM Federal Programs Corporation, 10 September 1993.

14. Phone Conversation Record: Conversation between Supervisor, City of Newark Sewer Department, and Michele Capriglione, Region 2 SAT, 23 September 2004.

15. Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years, U.S. Department of Agriculture, Technical Paper No. 40.

16. Federal Emergency Management Agency, National Flood Insurance Program, Flood Insurance Rate Map (FIRM), City of Newark, New Jersey, Essex County, Community-Panel Number: 340189 0005 B, Map Effective 28 March 1980.

17. Project Note from Michele Capriglione, Region 2 SAT, to Cellofilm Corporation File, Subject: Threatened, Endangered, and Fishable Species of the Newark Bay Complex, 6 October 2004; with attachment.

18. Site Location Map for the Cellofilm Corporation site, compiled from USGS 7.5-Minute Series (Topographic) Quadrangle for: "Elizabeth, NJ-NY," 1967, photorevised 1981.

19. Project Note from Dennis Foerter, Region 2 SAT, to Cellofilm Corporation File, Subject: ISRA Investigation at the Former Reichhold Chemical facility (46 Albert Avenue), 24 January 2005.

20. Four-Mile Radius Map for the Cellofilm Corporation site, compiled from USGS 7.5-Minute Series (Topographic) Quadrangles for: "Elizabeth, NJ-NY," 1967, photorevised 1981; Weehawkin, NJ-NY, 1967, photorevised 1981; Orange, NJ 1955, photorevised 1981; and Jersey City, NJ-NY, 1967, photorevised 1981.

21. Fifteen Mile Surface Water Pathway Map for the Cellofilm Corporation site, compiled from USGS 7.5-Minute Series (Topographic) Quadrangles for: "Elizabeth, NJ-NY," 1967, photorevised 1981; Weehawkin, NJ-NY, 1967, photorevised 1981; Orange, NJ 1955, photorevised 1981; and Jersey City, NJ-NY, 1967, photorevised 1981.

22. Phone Conversation Record: Conversation between Ed Apalinski, NJDEP Bureau of Safe Drinking Water, and Michele Capriglione, Region 2 SAT, 25 January 2005.

23. Project Note from Michele Capriglione, Region 2 SAT, to Cellofilm Corporation File, Subject: Wetlands Within a 4-Mile Radius, 15 September 2004.

REFERENCES (continued)

24. Letter from Herbert A. Lord, Data Request Specialist, NJDEP, Division of Parks and forestry, Office of Land Management, Natural Heritage Program, to Michele Capriglione, Weston Solutions, Inc., Re: Cellofilm Corporation, 13 October 2004.

25. Project Note from Michele Capriglione, Region 2 SAT, to Cellofilm Corporation File, Subject: RCRA Search for Lomma Trucking, 6 December 2004.

26. Environmental Data Resources, Inc. (EDR) Radius Map with GeoCheck® Report prepared for Cellofilm, 23 May 2003.

27. Site Map for the Cellofilm Corporation site, Newark, New Jersey, prepared by Weston Solutions, Inc., 4 October 2004.

Reference 1

federal register

Friday
December 14, 1990

Part II

Environmental Protection Agency

40 CFR Part 300
Hazard Ranking System; Final Rule

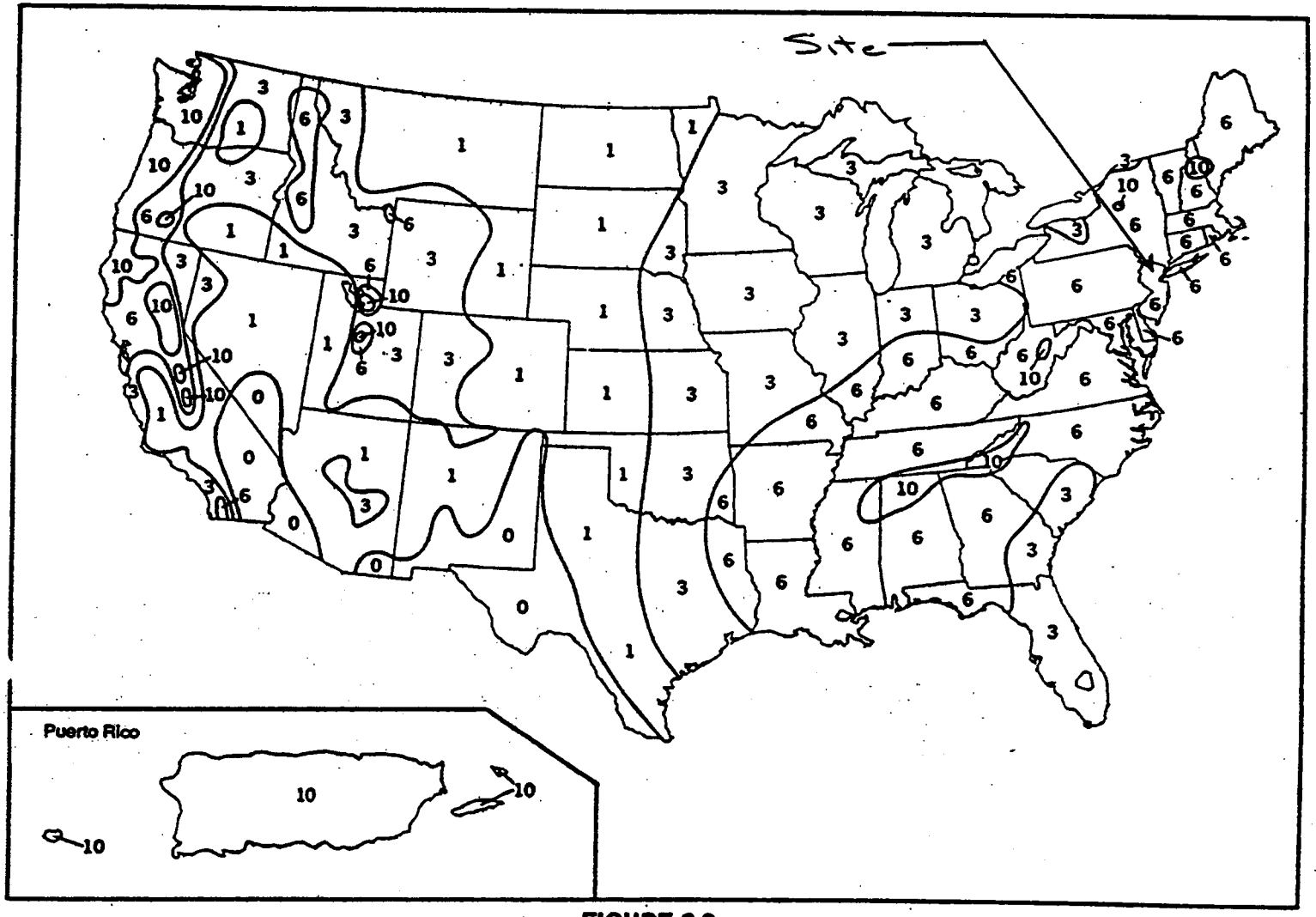

FIGURE 3-2
NET PRECIPITATION FACTOR VALUES

2

–When measured monthly evapotranspiration is not available, calculate monthly potential evapotranspiration (E_i) as follows:

$$E_i = 0.6\, F_i\, (10\, T_i/I)^a$$

where:

E_i = Monthly potential evapotranspiration (inches) for month i.

F_i = Monthly latitude adjusting value for month i.

T_i = Mean monthly temperature (°C) for month i.

$$I = \sum_{i=1}^{12} (T_i/5)^{1.514}$$

$$a = 6.75 \times 10^{-7} I^3 - 7.71 \times 10^{-5} I^2 + 1.79 \times 10^{-2} I + 0.49239$$

Select the latitude adjusting value for each month from Table 3–3. For latitudes lower than 50° North or 20° South, determine the monthly latitude adjusting value by interpolation.

• Calculate monthly net precipitation by subtracting monthly evapotranspiration (or monthly potential evapotranspiration) from monthly precipitation. If evapotranspiration (or potential evapotranspiration) exceeds precipitation for a month, assign that month a net precipitation value of 0.

• Calculate the annual net precipitation by summing the monthly net precipitation values.

• Based on the annual net precipitation, assign a net precipitation factor value from Table 3–4.

Enter the value assigned from Figure 3–2 or from Table 3–4, as appropriate, in Table 3–1.

TABLE 3–3.—MONTHLY LATITUDE ADJUSTING VALUES[a]

Latitude[b] (degrees)	Month											
	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
≥50 N	0.74	0.78	1.02	1.15	1.33	1.36	1.37	1.25	1.06	0.92	0.76	0.70
45 N	0.80	0.81	1.02	1.13	1.28	1.29	1.31	1.21	1.04	0.94	0.79	0.75
40 N	0.84	0.83	1.03	1.11	1.24	1.25	1.27	1.18	1.04	0.96	0.83	0.81
35 N	0.87	0.85	1.03	1.09	1.21	1.21	1.23	1.16	1.03	0.97	0.89	0.85
30 N	0.90	0.87	1.03	1.08	1.18	1.17	1.20	1.14	1.03	0.98	0.89	0.88
20 N	0.95	0.90	1.03	1.05	1.13	1.11	1.14	1.11	1.02	1.00	0.93	0.94
10 N	1.00	0.91	1.03	1.03	1.08	1.06	1.08	1.07	1.02	1.02	0.98	0.99
0	1.04	0.94	1.04	1.01	1.04	1.01	1.04	1.04	1.01	1.04	1.01	1.04
10 S	1.08	0.97	1.05	0.99	1.00	0.96	1.00	1.02	1.00	1.06	1.05	1.09
20 S	1.14	0.99	1.05	0.97	0.96	0.91	0.95	0.99	1.00	1.08	1.09	1.15

[a] Do not round to nearest integer.
[b] For unlisted latitudes lower than 50° North or 20° South, determine the latitude adjusting value by interpolation.

TABLE 3–4.—NET PRECIPITATION FACTOR VALUES

Net precipitation (inches)	Assigned value
0	0
Greater than 0 to 5	1
Greater than 5 to 15	3
Greater than 15 to 30	6
Greater than 30	10

3.1.2.3 *Depth to aquifer.* Evaluate depth to aquifer by determining the depth from the lowest known point of hazardous substances at a site to the top of the aquifer being evaluated, considering all layers in that interval. Measure the depth to an aquifer as the distance from the surface to the top of the aquifer minus the distance from the surface to the lowest known point of hazardous substances eligible to be evaluated for that aquifer. In evaluating depth to aquifer in karst terrain, assign a thickness of 0 feet to a karst aquifer that underlies any portion of the sources at the site. Based on the calculated depth, assign a value from Table 3–5 to the depth to aquifer factor.

Determine the depth to aquifer only at locations within 2 miles of the sources at the site, except: if observed ground water contamination attributable to sources at the site extends more than 2 miles beyond these sources, use any location within the limits of this observed ground water contamination when evaluating the depth to aquifer factor for any aquifer that does not have an observed release. If the necessary geologic information is available at multiple locations, calculate the depth to aquifer at each location. Use the location having the smallest depth to assign the factor value. Enter this value in Table 3–1.

TABLE 3–5.—DEPTH TO AQUIFER FACTOR VALUES

Depth to aquifer[a] (feet)	Assigned value
Less than or equal to 25	5
Greater than 25 to 250	3
Greater than 250	1

[a] Use depth of all layers between the hazardous substances and aquifer. Assign a thickness of 0 feet to any karst aquifer that underlies any portion of the sources at the site.

3.1.2.4 *Travel time.* Evaluate the travel time factor based on the geologic materials in the interval between the lowest known point of hazardous substances at the site and the top of the aquifer being evaluated. Assign a value to the travel time factor as follows:

• If the depth to aquifer (see section 3.1.2.3) is 10 feet or less, assign a value of 35.

• If, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of 35.

• Otherwise:

–Select the lowest hydraulic conductivity layer(s) from within the above interval. Consider only layers at least 3 feet thick. However, do not consider layers or portions of layers within the first 10 feet of the depth to the aquifer.

–Determine hydraulic conductivities for individual layers from Table 3–6 or from in-situ or laboratory tests. Use representative, measured, hydraulic conductivity values whenever available.

–If more than one layer has the same lowest hydraulic conductivity, include all such layers and sum their thicknesses. Assign a thickness of 0 feet to a karst layer that underlies any portion of the sources at the site.

–Assign a value from Table 3–7 to the travel time factor, based on the thickness and hydraulic conductivity of the lowest hydraulic conductivity layer(s).

TABLE 3-6.—HYDRAULIC CONDUCTIVITY OF GEOLOGIC MATERIALS

Type of material	Assigned hydraulic conductivity [a] (cm/sec)
Clay; low permeability till (compact unfractured till); shale; unfractured metamorphic and igneous rocks	10^{-8} 10^{-8}
Silt; loesses; silty clays; sediments that are predominantly silts; moderately permeable till (fine-grained, unconsolidated till, or compact till with some fractures); low permeability limestones and dolomites (no karst); low permeability sandstone; low permeability fractured igneous and metamorphic rocks	10^{-6} 10^{-6}
Sands; sandy silts; sediments that are predominantly sand; highly permeable till (coarse-grained, unconsolidated or compact and highly fractured); peat; moderately permeable limestones and dolomites (no karst); moderately permeable sandstone; moderately permeable fractured igneous and metamorphic rocks	10^{-4} 10^{-4}
Gravel; clean sand; highly permeable fractured igneous and metamorphic rocks; permeable basalt; karst limestones and dolomites	10^{-2} 10^{-2}

[a] Do not round to nearest integer.

TABLE 3-7.—TRAVEL TIME FACTOR VALUES [a]

Hydraulic conductivity (cm/sec)	Thickness of lowest hydraulic conductivity layer(s)[b] (feet)			
	Greater than 3 to 5	Greater than 5 to 100	Greater than 100 to 500	Greater than 500
Greater than or equal to 10^{-3} 10^{-3}	35	35	35	25
Less than 10^{-3} to 10^{-5} $10^{-3} \rightarrow 10^{-5}$	35	25	15	15
Less than 10^{-5} to 10^{-7} 10^{-5} to 10^{-7}	15	15	5	5
Less than 10^{-7} 10^{-7}	5	5	1	1

[a] If depth to aquifer is 10 feet or less or if, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of 35.

[b] Consider only layers at least 3 feet thick. Do not consider layers or portions of layers within the first 10 feet of the depth to the aquifer.

Determine travel time only at locations within 2 miles of the sources at the site, except: if observed ground water contamination attributable to sources at the site extends more than 2 miles beyond these sources, use any location within the limits of this observed ground water contamination when evaluating the travel time factor for any aquifer that does not have an observed release. If the necessary subsurface geologic information is available at multiple locations, evaluate the travel time factor at each location. Use the location having the highest travel time factor value to assign the factor value for the aquifer. Enter this value in Table 3-1.

3.1.2.5 *Calculation of potential to release factor value.* Sum the factor values for net precipitation, depth to aquifer, and travel time, and multiply this sum by the factor value for containment. Assign this product as the potential to release factor value for the aquifer. Enter this value in Table 3-1.

3.1.3 *Calculation of likelihood of release factor category value.* If an observed release is established for an aquifer, assign the observed release factor value of 550 as the likelihood of release factor category value for that aquifer. Otherwise, assign the potential to release factor value for that aquifer as the likelihood of release value. Enter the value assigned in Table 3-1.

3.2 *Waste characteristics.* Evaluate the waste characteristics factor category for an aquifer based on two factors: toxicity/mobility and hazardous waste quantity. Evaluate only those hazardous substances available to migrate from the sources at the site to ground water. Such hazardous substances include:

- Hazardous substances that meet the criteria for an observed release to ground water.
- All hazardous substances associated with a source that has a ground water containment factor value greater than 0 (see sections 2.2.2, 2.2.3, and 3.1.2.1).

3.2.1 *Toxicity/mobility.* For each hazardous substance, assign a toxicity factor value, a mobility factor value, and a combined toxicity/mobility factor value as specified in the following sections. Select the toxicity/mobility factor value for the aquifer being evaluated as specified in section 3.2.1.3.

3.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in Section 2.4.1.1.

3.2.1.2 *Mobility.* Assign a mobility factor value to each hazardous substance for the aquifer being evaluated as follows:

- For any hazardous substance that meets the criteria for an observed release by chemical analysis to one or more aquifers underlying the sources at the site, regardless of the aquifer being evaluated, assign a mobility factor value of 1.
- For any hazardous substance that does not meet the criteria for an observed release by chemical analysis to at least one of the aquifers, assign that hazardous substance a mobility factor value from Table 3-8 for the aquifer being evaluated, based on its water solubility and distribution coefficient (K_d).
- If the hazardous substance cannot be assigned a mobility factor value because data on its water solubility or distribution coefficient are not available, use other hazardous substances for which information is available in evaluating the pathway.

TABLE 3-8.—GROUND WATER MOBILITY FACTOR VALUES [a]

Water solubility (mg/l)	Distribution coefficient (K_d) (ml/g)			
	Karst [c]	≤ 10	>10 to 1,000	>1,000
Present as liquid [b]	1	1	0.01	0.0001
Greater than 100	1	1	0.01	0.0001
Greater than 1 to 100	0.2	0.2	0.002	2×10^{-5}
Greater than 0.01 to 1	0.002	0.002	2×10^{-5}	2×10^{-7}
Less than or equal to 0.01	2×10^{-5}	2×10^{-6}	2×10^{-7}	2×10^{-9}

[a] Do not round to nearest integer.
[b] Use if the hazardous substance is present or deposited as a liquid.
[c] Use if the entire interval from the source to the aquifer being evaluated is karst.

Drainage area. Determine the drainage area for the sources at the site. Include in this drainage area both the source areas and the area upgradient of the sources, but exclude any portion of this drainage area for which runoff is diverted from entering the sources by storm sewers or run-on control and/or runoff management systems. Assign a drainage area value for the watershed from Table 4–3.

Soil group. Based on the predominant soil group within the drainage area described above, assign a soil group designation for the watershed from Table 4–4 as follows:

• Select the predominant soil group as that type which comprises the largest total area within the applicable drainage area.

• If a predominant soil group cannot be delineated, select that soil group in the drainage area that yields the highest value for the runoff factor.

Calculation of runoff factor value. Assign a combined rainfall/runoff value for the watershed from Table 4–5, based on the 2-year, 24-hour rainfall and the soil group designation. Determine the runoff factor value for the watershed from Table 4–6, based on the rainfall/runoff and drainage area values. Enter the runoff factor value in Table 4–1.

TABLE 4–3.—DRAINAGE AREA VALUES

Drainage area (acres)	Assigned value
Less than 50	1
50 to 250	2
Greater than 250 to 1,000	3
Greater than 1,000	4

TABLE 4–4.—SOIL GROUP DESIGNATIONS

Surface soil description	Soil group designation
Coarse-textured soils with high infiltration rates (for example, sands, loamy sands).	A
Medium-textured soils with moderate infiltration rates (for example, sandy loams, loams).	B
Moderately fine-textured soils with low infiltration rates (for example, silty loams, silts, sandy clay loams).	C
Fine-textured soils with very low infiltration rates (for example, clays, sandy clays, silty clay loams, clay loams, silty clays); or impermeable surfaces (for example, pavement).	D

TABLE 4–5.—RAINFALL/RUNOFF VALUES

2-Year, 24-hour rainfall (inches)	Soil group designation			
	A	B	C	D
Less than 1.0	0	0	2	3
1.0 to less than 1.5	0	1	2	3
1.5 to less than 2.0	0	2	3	4
2.0 to less than 2.5	1	2	3	4
2.5 to less than 3.0	2	3	4	4
3.0 to less than 3.5	2	3	4	5
3.5 or greater	3	4	5	6

TABLE 4–6.—RUNOFF FACTOR VALUES

Drainage area value	Rainfall/runoff value						
	0	1	2	3	4	5	6
1	0	0	0	1	1	1	1
2	0	0	1	1	2	3	4
3	0	0	1	3	7	11	15
4	0	1	2	7	17	25	25

4.1.2.1.2.1.3 *Distance to surface water.* Evaluate the distance to surface water as the shortest distance, along the overland segment, from any source with a surface water containment factor value greater than 0 to either the mean high water level for tidal waters or the mean water level for other surface waters. Based on this distance, assign a value from Table 4–7 to the distance to surface water factor for the watershed. Enter this value in Table 4–1.

4.1.2.1.2.1.4 *Calculation of factor value for potential to release by overland flow.* Sum the factor values for runoff and distance to surface water for the watershed and multiply this sum by the factor value for containment. Assign the resulting product as the factor value for potential to release by overland flow for the watershed. Enter this value in Table 4–1.

4.1.2.1.2.2 *Potential to release by flood.* Evaluate potential to release by flood for each watershed as the product of two factors: containment (flood) and flood frequency. Evaluate potential to release by flood separately for each source that is within the watershed. Furthermore, for each source, evaluate potential to release by flood separately for each category of floodplain in which the source lies. (See section 4.1.2.1.2.2.2 for the applicable floodplain categories.) Calculate the value for the potential to release by flood factor as specified in 4.1.2.1.2.2.3.

4.1.2.1.2.2.1 *Containment (flood).* For each source within the watershed, separately evaluate the containment (flood) factor for each category of floodplain in which the source is partially or wholly located. Assign a containment (flood) factor value from Table 4–8 to each floodplain category applicable to that source. Assign a containment (flood) factor value of 0 to each floodplain category in which the source does not lie.

4.1.2.1.2.2.2 *Flood frequency.* For each source within the watershed, separately evaluate the flood frequency factor for each category of floodplain in which the source is partially or wholly located. Assign a flood frequency factor value from Table 4–9 to each floodplain category in which the source is located.

4.1.2.1.2.2.3 *Calculation of factor value for potential to release by flood.* For each source within the watershed and for each category of floodplain in which the source is partially or wholly located, calculate a separate potential to release by flood factor value. Calculate this value as the product of the containment (flood) value and the flood frequency value applicable to the source for the floodplain category. Select the highest value calculated for those sources that meet the minimum size requirement specified in section 4.1.2.1.2.1.1 and assign it as the value for the potential to release by flood factor for the watershed. However, if, for this watershed, no source at the site meets the minimum size requirement, select the highest value calculated for the sources at the site eligible to be evaluated for this watershed and assign it as the value for this factor.

TABLE 4–7.—DISTANCE TO SURFACE WATER FACTOR VALUES

Distance	Assigned value
Less than 100 feet	25
100 feet to 500 feet	20
Greater than 500 feet to 1,000 feet	16
Greater than 1,000 feet to 2,500 feet	9
Greater than 2,500 feet to 1.5 miles	6
Greater than 1.5 miles to 2 miles	3

TABLE 4–8.—CONTAINMENT (FLOOD) FACTOR VALUES

Containment criteria	Assigned value
Documentation that containment at the source is designed, constructed, operated, and maintained to prevent a washout of hazardous substances by the flood being evaluated.	0
Other	10

TABLE 4–9.—FLOOD FREQUENCY FACTOR VALUES

Floodplain category	Assigned value
Source floods annually	50
Source in 10-year floodplain	50
Source in 100-year floodplain	25
Source in 500-year floodplain	7
None of above	0

Enter this highest potential to release by flood factor value for the watershed in Table 4–1, as well as the values for containment (flood) and flood frequency that yield this highest value.

4.1.2.1.2.3 *Calculation of potential to release factor value.* Sum the factor values assigned to the watershed for potential to release by overland flow and potential to release by flood. Assign this sum as the potential to release factor value for the watershed, subject to a maximum value of 500. Enter this value in Table 4–1.

4.1.2.1.3 *Calculation of drinking water threat-likelihood of release factor category value.* If an observed release is established for the watershed, assign the observed release factor value of 550 as the likelihood of release factor category value for that watershed. Otherwise, assign the potential to release factor value for that watershed as the likelihood of release factor category value for that watershed. Enter the value assigned in Table 4–1.

4.1.2.2 *Drinking water threat-waste characteristics.* Evaluate the waste characteristics factor category for each

the hazardous substance with the highest toxicity/persistence factor value for the watershed to assign the toxicity/persistence factor value for the drinking water threat for the watershed. Enter this value in Table 4–1.

4.1.2.2.2 *Hazardous waste quantity.* Assign a hazardous waste quantity factor value for the watershed as specified in section 2.4.2. Enter this value in Table 4–1.

4.1.2.2.3 *Calculation of drinking water threat-waste characteristics factor category value.* Multiply the toxicity/persistence and hazardous waste quantity factor values for the watershed, subject to a maximum product of 1×10^8. Based on this product, assign a value from Table 2–7 (section 2.4.3.1) to the drinking water threat-waste characteristics factor category for the watershed. Enter this value in Table 4–1.

TABLE 4–12.—TOXICITY/PERSISTENCE FACTOR VALUES [a]

Persistence factor value	Toxicity factor value					
	10,000	1,000	100	10	1	0
1.0	10,000	1,000	100	10	1	0
0.4	4,000	400	40	4	0.4	0
0.07	700	70	7	0.7	0.07	0
0.0007	7	0.7	0.07	0.007	0.0007	0

[a] Do not round to nearest integer.

4.1.2.3 *Drinking water threat-targets.* Evaluate the targets factor category for each watershed based on three factors: nearest intake, population, and resources.

To evaluate the nearest intake and population factors, determine whether the target surface water intakes are subject to actual or potential contamination as specified in section 4.1.1.2. Use either an observed release based on direct observation at the intake or the exposure concentrations from samples (or comparable samples) taken at or beyond the intake to make this determination (see section 4.1.2.1.1). The exposure concentrations for a sample (that is, surface water, benthic, or sediment sample) consist of the concentrations of those hazardous substances present that are significantly above background levels and attributable at least in part to the site (that is, those hazardous substance concentrations that meet the criteria for an observed release).

When an intake is subject to actual contamination, evaluate it using Level I concentrations or Level II concentrations. If the actual contamination is based on an observed release by direct observation, use Level II concentrations for that intake. However, if the actual contamination is based on an observed release from samples, determine which level applies for the intake by comparing the exposure concentrations from samples (or comparable samples) to health-based benchmarks as specified in sections 2.5.1 and 2.5.2. Use the health-based benchmarks from Table 3–10 (section 3.3.1) in determining the level of contamination from samples. For contaminated sediments with no identified source, evaluate the actual contamination using Level II concentrations (see section 4.1.1.2).

4.1.2.3.1 *Nearest intake.* Evaluate the nearest intake factor based on the drinking water intakes along the overland/flood hazardous substance migration path for the watershed. Include standby intakes in evaluating this factor only if they are used for supply at least once a year.

Assign the nearest intake factor a value as follows and enter the value in Table 4–1:

- If one or more of these drinking water intakes is subject to Level I concentrations as specified in section 4.1.2.3, assign a factor value of 50.
- If not, but if one or more of these drinking water intakes is subject to Level II concentrations, assign a factor value of 45.
- If none of these drinking water intakes is subject to Level I or Level II concentrations, determine the nearest of these drinking water intakes, as measured from the probable point of entry (or from the point where measurement begins for contaminated sediments with no identified source). Assign a dilution weight from Table 4–13 to this intake, based on the type of surface water body in which it is located. Multiply this dilution weight by 20, round the product to the nearest integer, and assign it as the factor value.

Assign the dilution weight from Table 4–13 as follows:

TABLE 4–13.—SURFACE WATER DILUTION WEIGHTS

Type of surface water body [a]		Assigned dilution weight [b]
Descriptor	Flow characteristics	
Minimal stream	Less than 10 cfs [c]	1
Small to moderate stream	10 to 100 cfs	0.1
Moderate to large stream	Greater than 100 to 1,000 cfs	0.01
Large stream to river	Greater than 1,000 to 10,000 cfs	0.001
Large river	Greater than 10,000 to 100,000 cfs	0.0001
Very large river	Greater than 100,000 cfs	0.00001
Coastal tidal waters [d]	Flow not applicable, depth not applicable	0.0001
Shallow ocean zone [e] or Great Lake	Flow not applicable, depth less than 20 feet	0.0001
Moderate depth ocean zone [e] or Great Lake	Flow not applicable, depth 20 to 200 feet	0.00001
Deep ocean zone [e] or Great Lake	Flow not applicable, depth greater than 200 feet	0.000005
3-mile mixing zone in quiet flowing river	10 cfs or greater	0.5

[a] Treat each lake as a separate type of water body and assign a dilution weight as specified in text.
[b] Do not round to nearest integer.
[c] cfs = cubic feet per second.
[d] Embayments, harbors, sounds, estuaries, back bays, lagoons, wetlands, etc., seaward from mouths of rivers and landward from baseline of Territorial Sea.
[e] Seaward from baseline of Territorial Sea. This baseline represents the generalized U.S. coastline. It is parallel to the seaward limit of the Territorial Sea and other maritime limits such as the inner boundary of the Federal fisheries jurisdiction and the limit of States jurisdiction under the Submerged Lands Act, as amended.

- For a river (that is, surface water body types specified in Table 4–13 as minimal stream through very large river), assign a dilution weight based on the average annual flow in the river at the intake. If available, use the average annual discharge as defined in the U.S. Geological Survey Water Resources Data Annual Report. Otherwise, estimate the average annual flow.
- For a lake, assign a dilution weight as follows:
  - –For a lake that has surface water flow entering the lake, assign a dilution weight based on the sum of the

4.1.4.2.2 *Hazardous waste quantity.* Assign the same factor value for hazardous waste quantity for the watershed as would be assigned in section 4.1.2.2.2 for the drinking water threat. Enter this value in Table 4–1.

4.1.4.2.3 *Calculation of environmental threat-waste characteristics factor category value.* For the hazardous substance selected for the watershed in section 4.1.4.2.1.4, use its ecosystem toxicity/persistence factor value and ecosystem bioaccumulation potential factor value as follows to assign a value to the waste characteristics factor category. First, multiply the ecosystem toxicity/persistence factor value and the hazardous waste quantity factor value for the watershed, subject to a maximum product of 1×10^8. Then multiply this product by the ecosystem bioaccumulation potential factor value for this hazardous substance, subject to a maximum product of 1×10^{12}. Based on this second product, assign a value from Table 2–7 (section 2.4.3.1) to the environmental threat-waste characteristics factor category for the watershed. Enter this value in Table 4–1.

TABLE 4–22.—ECOLOGICAL-BASED BENCHMARKS FOR HAZARDOUS SUBSTANCES IN SURFACE WATER

- Concentration corresponding to EPA Ambient Water Quality Criteria (AWQC) for protection of aquatic life (fresh water or marine).
- Concentration corresponding to EPA Ambient Aquatic Life Advisory Concentrations (AALAC).
- Select the appropriate AWQC and AALAC as follows:
  - –Use chronic value, if available; otherwise use acute value.
  - –If the sensitive environment being evaluated is in fresh water, use fresh water value, except: if no fresh water value is available, use marine value if available.
  - –If the sensitive environment being evaluated is in salt water, use marine value, except: if no marine value is available, use fresh water value if available.
  - –If the sensitive environment being evaluated is in both fresh water and salt water, or is in brackish water, use lower of fresh water or marine values.

TABLE 4–23.—SENSITIVE ENVIRONMENTS RATING VALUES

Sensitive environment	Assigned value
Critical habitat [a] for Federal designated endangered or threatened species Marine Sanctuary National Park Designated Federal Wilderness Area Areas identified under Coastal Zone Management Act [b] Sensitive areas identified under National Estuary Program [c] or Near Coastal Waters Program [d] Critical areas identified under the Clean Lakes Program [e] National Monument [f] National Seashore Recreational Area National Lakeshore Recreational Area	100
Habitat known to be used by Federal designated or proposed endangered or threatened species National Preserve National or State Wildlife Refuge Unit of Coastal Barrier Resources System Coastal Barrier (undeveloped) Federal land designated for protection of natural ecosystems Administratively Proposed Federal Wilderness Area Spawning areas critical [g] for the maintenance of fish/shellfish species within river, lake, or coastal tidal waters Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time Terrestrial areas utilized for breeding by large or dense aggregations of animals [h] National river reach designated as Recreational	75
Habitat known to be used by State designated endangered or threatened species Habitat known to be used by species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federal designated Scenic or Wild River	50
State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	25
State designated areas for protection or maintenance of aquatic life [i]	5

[a] Critical habitat as defined in 50 CFR 424.02.
[b] Areas identified in State Coastal Zone Management plans as requiring protection because of ecological value.
[c] National Estuary Program study areas (subareas within estuaries) identified in Comprehensive Conservation and Management Plans as requiring protection because they support critical life stages of key estuarine species (Section 320 of Clean Water Act, as amended).
[d] Near Coastal Waters as defined in Sections 104(b)(3), 304(1), 319, and 320 of Clean Water Act, as amended.
[e] Clean Lakes Program critical areas (subareas within lakes, or in some cases entire small lakes) identified by State Clean Lake Plans as critical habitat (Section 314 of Clean Water Act, as amended).
[f] Use only for air migration pathway.
[g] Limit to areas described as being used for intense or concentrated spawning by a given species.
[h] For the air migration pathway, limit to terrestrial vertebrate species. For the surface water migration pathway, limit to terrestrial vertebrate species with aquatic or semiaquatic foraging habits.
[i] Areas designated under Section 305(a) of Clean Water Act, as amended.

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Reference 2

U.S. Environmental Protection Agency

Superfund Information Systems

CERCLIS Database
Archived Sites
Record of Decision System (RODS)
Five-Year Reviews Online
Site Assessment Documentation Pilot
Site Spill Identifier List (SPIL)
Data Element Dictionary (DED)
Order Superfund Products
Customer Satisfaction Survey

CERCLIS Database

CELLOFILM CORPORATION

Site Information

Actions | Aliases | Contaminants | Actual Costs | Operable Units | Site Info | RODS
Site Narrative at Listing | NPL Fact Sheet | Five-Year Reviews | Area Map

Site Name: CELLOFILM CORPORATION
Street: 45-5 CORNELIA STREET
City / State / ZIP: NEWARK, NJ 07105

NPL Status: Not on the NPL
Non-NPL Status: SI Ongoing

EPA ID: NJD000813451
EPA Region: 02
County: ESSEX

Federal Facility Flag: Not a Federal Facility

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CELLOFILM CORPORATION

Aliases

Actions | Aliases | Contaminants | Actual Costs | Operable Units | Site Info | RODS
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Alias Name / Street / City / State / ZIP
REICHHOLD CHEMICALS - T ESSEX, NJ

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CELLOFILM CORPORATION

Actions

Actions | Aliases | Contaminants | Actual Costs | Operable Units | Site Info | RODS
Site Narrative at Listing | NPL Fact Sheet | Five-Year Reviews | Area Map

OU	Action Name	Qualifier	Lead	Actual Start	Actual Completion
00	DISCOVERY		F		03/13/1989
00	PRELIMINARY ASSESSMENT	D	F	03/24/1989	06/24/1989

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Reference 3

START II

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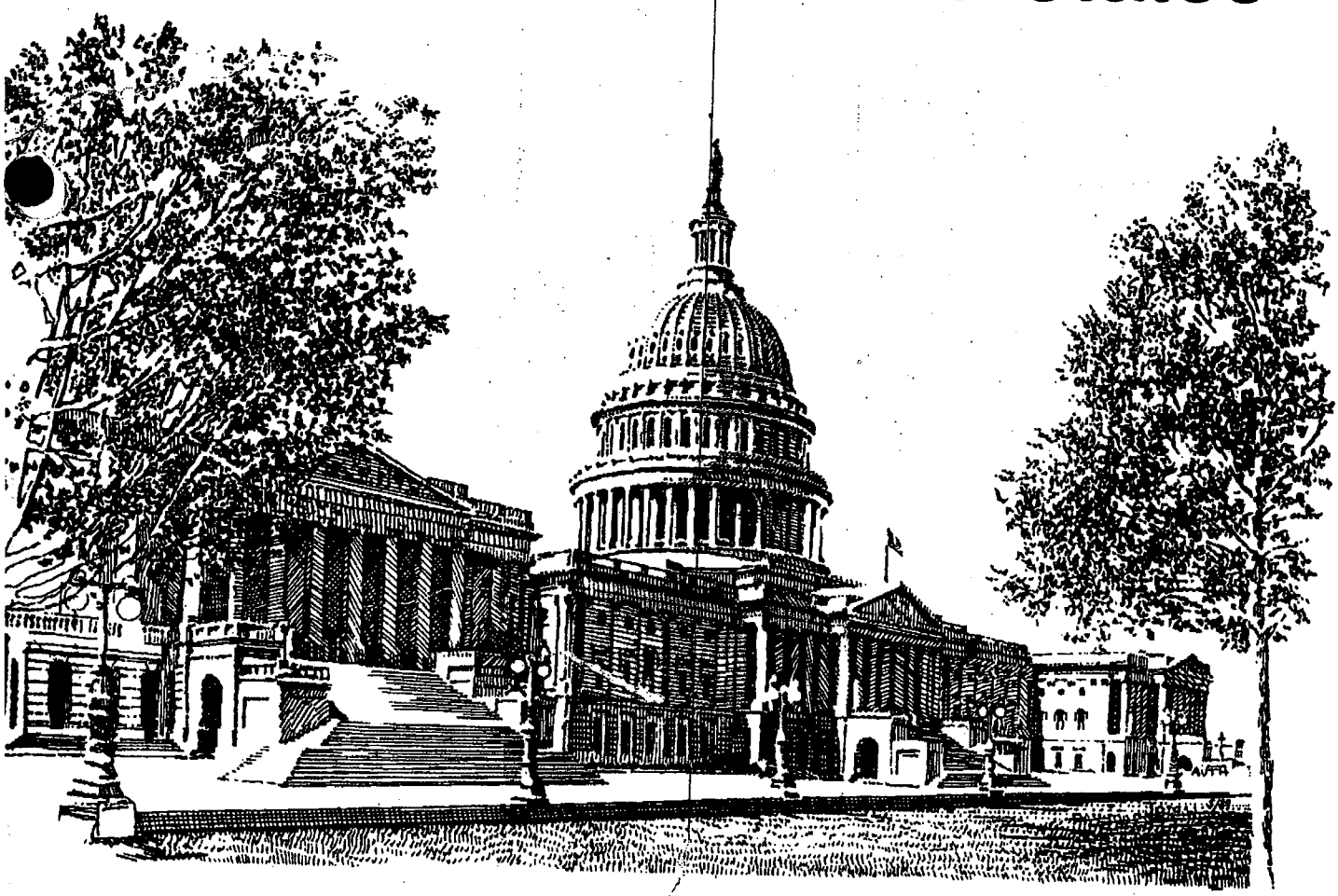
Volume 2

New Jersey - Wyoming,
American Samoa, Guam, Puerto Rico,
and Virgin Islands of the United States

Congressional District Atlas

103rd Congress of the United States



U.S. Department of Commerce
Economics and Statistics Administration
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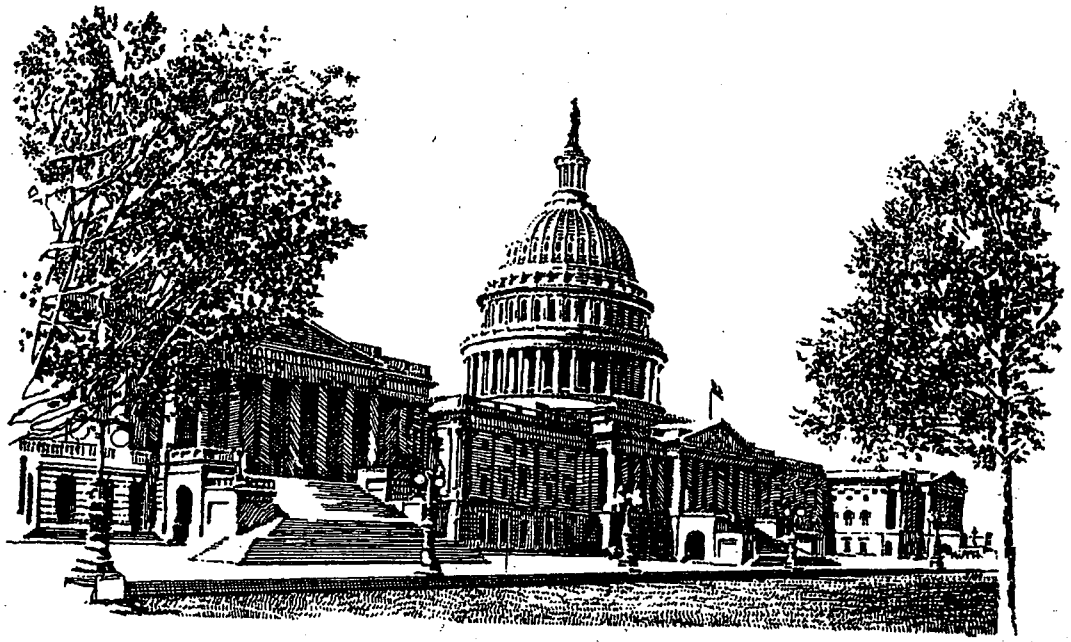
Volume 2
New Jersey - Wyoming,
American Samoa, Guam, Puerto Rico,
and Virgin Islands of the United States

Congressional District Atlas

103rd Congress of the United States

Issued February 1993



U.S. Department of Commerce
Ronald H. Brown, Secretary
John Rollwagen, Deputy Secretary

Economics and Statistics Administration
Jeffrey Mayer, Acting Under Secretary

BUREAU OF THE CENSUS
Harry A. Scarr, Acting Director

(2)

Congressional Districts (13 Districts)

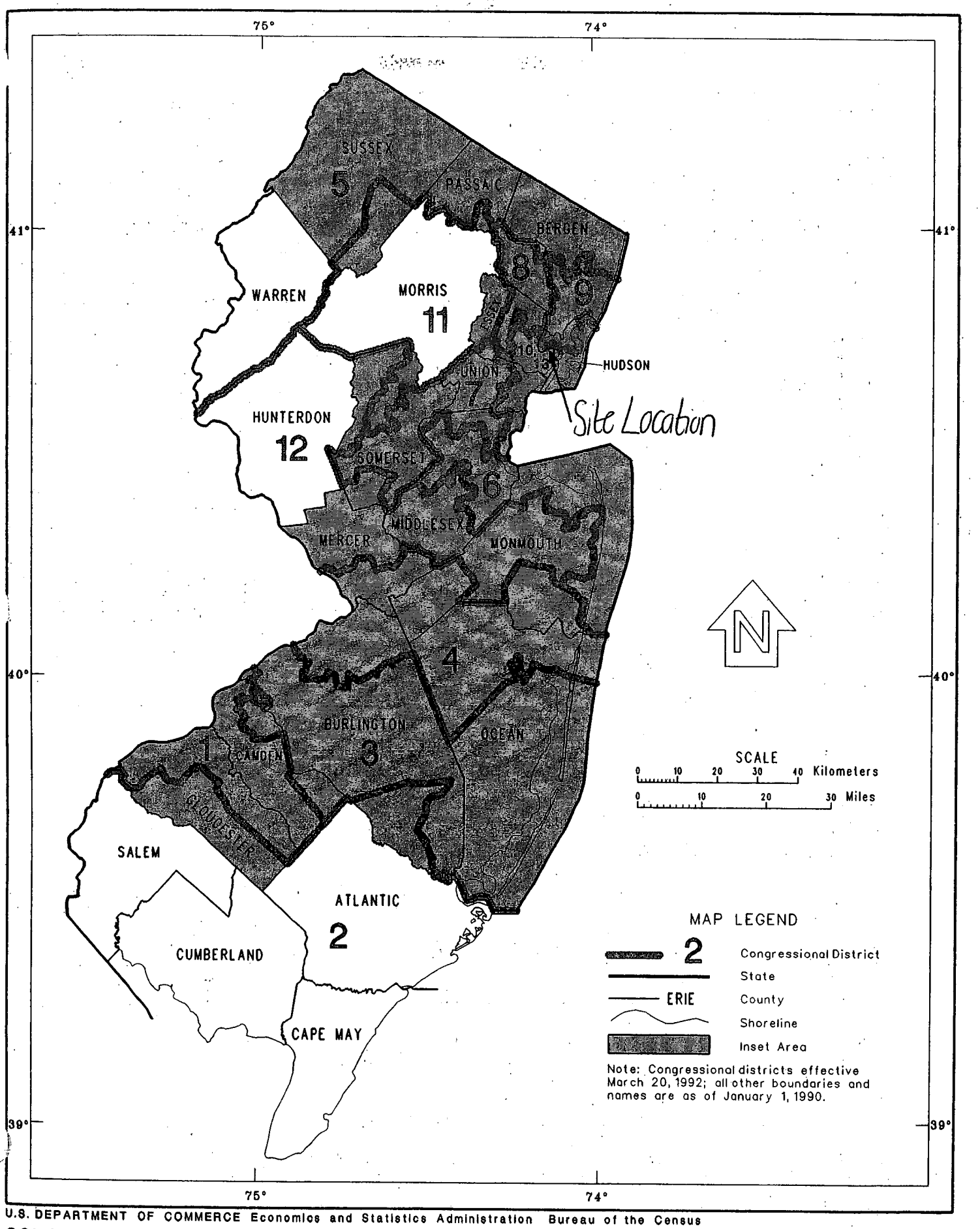


Table 1. **Places**—Con.

Place	County	Congressional district
Kenilworth borough	Union	7
Keyport borough	Monmouth	6
Kingston CDP	Middlesex	12
Kinnelon borough	Morris	11
Lakehurst borough	Ocean	4
Lake Mohawk CDP	Sussex	11
Lake Telemark CDP	Morris	11
Lakewood CDP	Ocean	4
Lambertville city	Hunterdon	12
Laurel Springs borough	Camden	1
Laurence Harbor CDP	Middlesex	6
Lavallette borough	Ocean	3
Lawnside borough	Camden	1
Lawrenceville CDP	Mercer	12
Lebanon borough	Hunterdon	12
Leisure Knoll CDP	Ocean	4
Leisuretowne CDP	Burlington	3
Leisure Village CDP	Ocean	4
Leisure Village East CDP	Ocean	4
Leisure Village West-Pine Lake Park CDP	Ocean	4
Leonardo CDP	Monmouth	6
Leonia borough	Bergen	9
Lincoln Park borough	Morris	11
Lincroft CDP	Monmouth	12
Linden city	Union	7,10,13
Lindenwold borough	Camden	1
Linwood city	Atlantic	2
Little Falls CDP	Passaic	8
Little Ferry borough	Bergen	9
Little Silver borough	Monmouth	12
Livingston CDP	Essex	7,11
Loch Arbour village	Monmouth	6
Lodi borough	Bergen	9
Long Branch city	Monmouth	6
Longport borough	Atlantic	2
Long Valley CDP	Morris	11
Lyndhurst CDP	Bergen	9
McGuire AFB CDP	Burlington	3,4
Madison borough	Morris	11
Madison Park CDP	Middlesex	6
Magnolia borough	Camden	1
Manahawkin CDP	Ocean	3
Manasquan borough	Monmouth	4
Mantoloking borough	Ocean	4
Manville borough	Somerset	7
Maple Shade CDP	Burlington	1
Maplewood CDP	Essex	7,8,10
Margate City city	Atlantic	2
Marlton CDP	Burlington	3
Matawan borough	Monmouth	6
Mays Landing CDP	Atlantic	2
Maywood borough	Bergen	9
Medford Lakes borough	Burlington	3
Mendham borough	Morris	11
Mercerville-Hamilton Square CDP	Mercer	4
Merchantville borough	Camden	3
Metuchen borough	Middlesex	6
Middlesex borough	Middlesex	7
Midland Park borough	Bergen	5
Milford borough	Hunterdon	12
Millburn CDP	Essex	7,11
Millstone borough	Somerset	7
Milltown borough	Middlesex	6
Millville city	Cumberland	2
Monmouth Beach borough	Monmouth	6
Monmouth Junction CDP	Middlesex	12
Montclair CDP	Essex	8,10
Montvale borough	Bergen	5
Moonachie borough	Bergen	9
Moorestown-Lenola CDP	Burlington	3
Morris Plains borough	Morris	11
Morristown town	Morris	11
Mountain Lakes borough	Morris	11
Mountainside borough	Union	7
Mount Arlington borough	Morris	11
Mount Ephraim borough	Camden	1
Mount Holly CDP	Burlington	3
Mullica Hill CDP	Gloucester	2
Mystic Island CDP	Ocean	3
National Park borough	Gloucester	1
Neptune City borough	Monmouth	6
Netcong borough	Morris	11
Newark city	Essex	10,13
New Brunswick city	Middlesex	6
New Egypt CDP	Ocean	4
Newfield borough	Gloucester	2
New Milford borough	Bergen	9
New Providence borough	Union	7
Newton town	Sussex	5
North Arlington borough	Bergen	9
North Beach Haven CDP	Ocean	3
North Bergen CDP	Hudson	9,13
North Brunswick Township CDP	Middlesex	6
North Caldwell CDP	Essex	11
North Cape May CDP	Cape May	2
Northfield city	Atlantic	2
North Haledon borough	Passaic	5,8
North Middletown CDP	Monmouth	6
North Plainfield borough	Somerset	7
Northvale borough	Bergen	5
North Wildwood city	Cape May	2
Norwood borough	Bergen	5
Nutley CDP	Essex	8
Oakhurst CDP	Monmouth	12
Oakland borough	Bergen	5
Oaklyn borough	Camden	1
Oak Valley CDP	Gloucester	1
Ocean Acres CDP	Ocean	3
Ocean City city	Cape May	2
Ocean Gate borough	Ocean	3
Ocean Grove CDP	Monmouth	6
Oceanport borough	Monmouth	12
Ogdensburg borough	Sussex	11
Old Bridge CDP	Middlesex	6
Old Tappan borough	Bergen	5
Olivet CDP	Salem	2
Oradell borough	Bergen	5
Orange CDP	Essex	10
Oxford CDP	Warren	5
Palisades Park borough	Bergen	9
Palmyra borough	Burlington	1
Paramus borough	Bergen	5
Park Ridge borough	Bergen	5
Parsippany-Troy Hills Township CDP	Morris	11
Passaic city	Passaic	8
Paterson city	Passaic	8
Paulsboro borough	Gloucester	1
Peapack and Gladstone borough	Somerset	12
Pemberton borough	Burlington	3
Pemberton Heights CDP	Burlington	3
Pennington borough	Mercer	12
Pennsauken CDP	Camden	1
Penns Grove borough	Salem	2
Pennsville CDP	Salem	2
Pequannock Township CDP	Morris	11
Perth Amboy city	Middlesex	13
Phillipsburg town	Warren	5
Pine Beach borough	Ocean	3
Pine Hill borough	Camden	1
Pine Ridge at Crestwood CDP	Ocean	4
Pine Valley borough	Camden	1
Pitman borough	Gloucester	2
Plainfield city	Union	7
Pleasant Plains CDP	Ocean	3,4
Pleasantville city	Atlantic	2
Point Pleasant borough	Ocean	4
Point Pleasant Beach borough	Ocean	4
Pomona CDP	Atlantic	2
Pompton Lakes borough	Passaic	8
Port Monmouth CDP	Monmouth	6
Port Norris CDP	Cumberland	2
Port Reading CDP	Middlesex	7,13
Port Republic city	Atlantic	2
Presidential Lakes Estates CDP	Burlington	3
Princeton borough	Mercer	12
Princeton Junction CDP	Mercer	12
Princeton North CDP	Mercer	12
Prospect Park borough	Passaic	6
Rahway city	Union	10
Ramblewood CDP	Burlington	3
Ramsey borough	Bergen	5
Raritan borough	Somerset	11
Red Bank borough	Monmouth	6
Ridgefield borough	Bergen	9
Ridgefield Park village	Bergen	9
Ridgewood village	Bergen	5
Ringwood borough	Passaic	5
Rio Grande CDP	Cape May	2
Riverdale borough	Morris	11
River Edge borough	Bergen	9
Riverside CDP	Burlington	3
Riverton borough	Burlington	1
River Vale CDP	Bergen	5
Robertsville CDP	Monmouth	12
Rochelle Park CDP	Bergen	5,9
Rockaway borough	Morris	11
Rockleigh borough	Bergen	5
Rocky Hill borough	Somerset	12
Roosevelt borough	Monmouth	4
Roseland borough	Essex	11
Roselle borough	Union	10
Roselle Park borough	Union	7
Rosenhayn CDP	Cumberland	2
Rossmoor CDP	Middlesex	12
Rumson borough	Monmouth	12
Runnemede borough	Camden	1
Rutherford borough	Bergen	9
Saddle Brook CDP	Bergen	9
Saddle River borough	Bergen	5
Salem city	Salem	2
Sayreville borough	Middlesex	6
Scotch Plains CDP	Union	7
Sea Bright borough	Monmouth	6
Seabrook Farms CDP	Cumberland	2
Sea Girt borough	Monmouth	6
Sea Isle City city	Cape May	2
Seaside Heights borough	Ocean	3
Seaside Park borough	Ocean	3
Secaucus town	Hudson	9
Sewaren CDP	Middlesex	13

Reference 4

LEVEL BOOK

Cellofilm Corporation

20103.001.001.1078.00

SAT 078 001

1

Cellofilm Corporation

45-5 Cornelia Ave
Essex County Newark NJ

Monday July 14 2003

1200 Michele Capnglione of Region II SAT and Ryan Brown of Weston arrive at Cornelia Ave, Newark, NJ. Located along Cornelia Ave are the former location of Reichhold Chemical and Cellofilm Corporation.

Former operations of Cellofilm Corporation were located on the southernmost block along Cornelia St. (see map on next page).

The site which was the former truck washing operations currently

7/14/03 Cellofilm Corporation

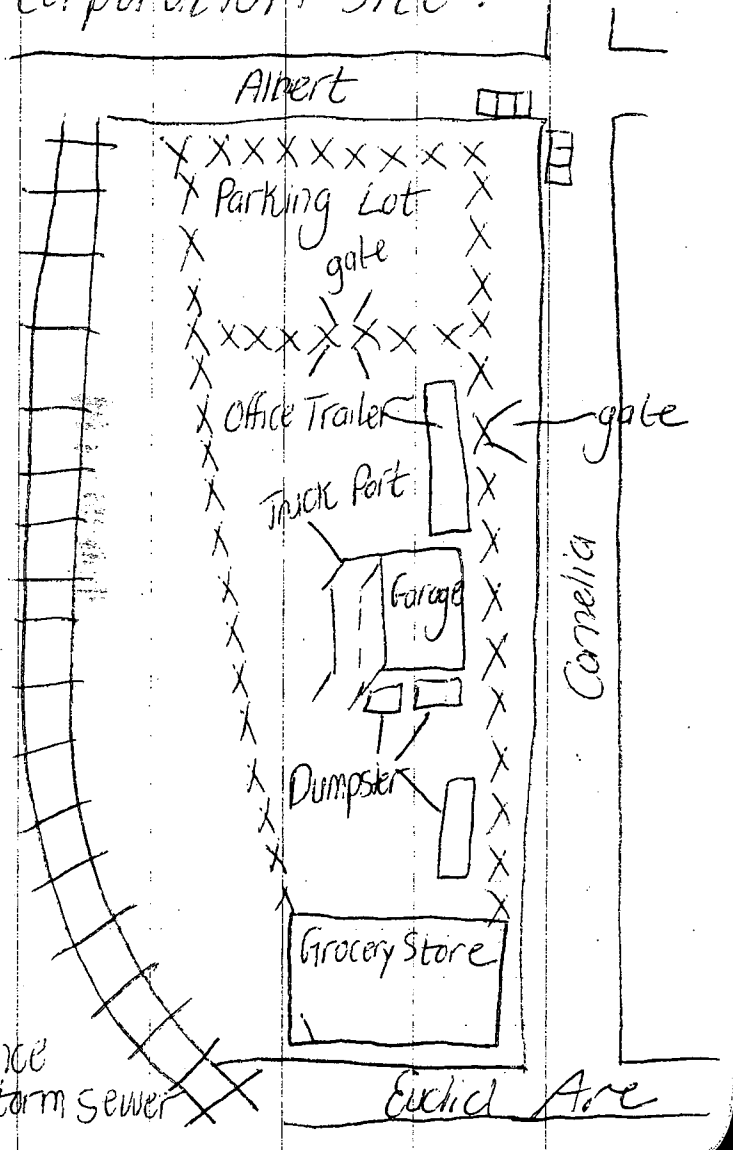
Consists of a partially fenced in lot an office trailer, 3 dumpsters, and a garage. The area appears to be used as a parking lot for Lomma Trucks.

The land use in the area is very industrial and commercial. There are no residences, daycares, recreational areas, or schools within 200 feet of the property.

Surface water runoff will most likely flow into storm sewers located at the corner of Cornelia & Albert Ave.

Cellofilm 7/14/03

Site map of the former Cellofilm Corporation site:



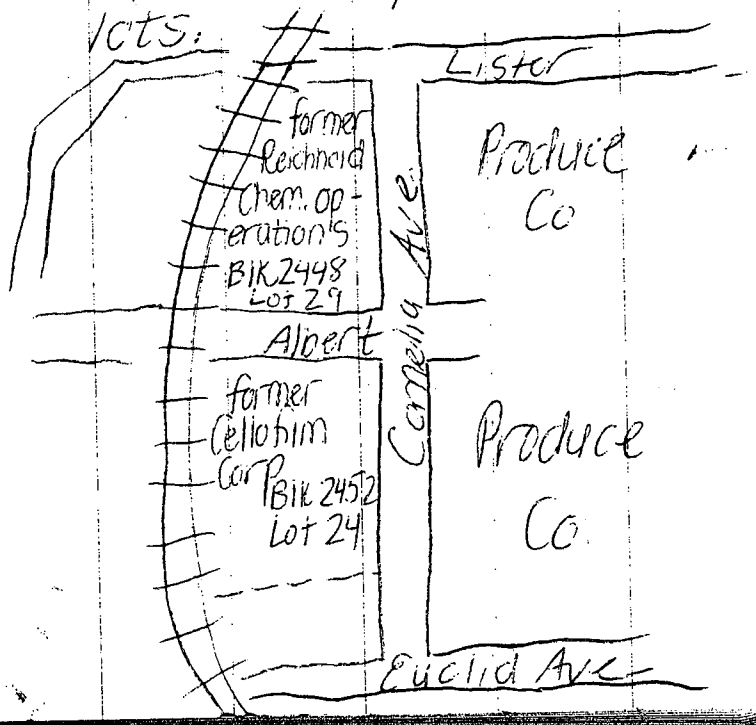
Cellofilm

September 28 2004

Michele Capnglione of Region II SAT arrived at the former location of Cellofilm Corporation to verify site features. The garage & truck port were observed as well as photo documented. While taking photos and confirming the presence of Lamma Trucks at this lot I met people who work at the Lamma Truck lot. They asked if I was with O'Brian & Gere (the consulting firm currently involved in the ISRA investagation for the former Reichhold Corporation facility). I

9/28/04 Cellofilm

said I was representing Weston and briefly explained the Region II SAT contract. They felt as though they should not discuss the facility with me but stated they were interested in purchasing the former Reichhold Chemical Corporation lots.



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9/28/04 Cellofilm

The Cellofilm site is a paved lot. Based on the number of cars in the parking lot (located in the northern portion of the property) of the site - an estimated 10 people work on site. There were about eight cars in the lot and two workers (previously mentioned) driving around the vicinity of the site.

There were no conditions observed on site which would warrant immediate or emergency action.

M. Capriglione

9/28/04 Cellofilm

Photo 1:
Looking West between garage and office trailer.

Photo 2:
Standing on Cornelia Street Looking North-west toward Cello film & Reichhold.

Photo 3:
Standing on Cornelia Street Looking west toward the parking lot

Photo 4:
The Northernmoste entrance into Cellofilm

Photo 5:
the entrance to

Cellofilm 9/28/04

Cellofilm [Note the cars in photo will be used to estimate workers on site 8 cars = 8 workers]

Photo 6:
Standing on Cornelia Street toward Garage

Photo 7:
The southern-most entrance to Cellofilm

Photo 8:
The Southern-most portion of the Cellofilm property looking Southwest.

Photo 9:
Photo taken through fence toward garage

Cellofilm 9/28/04

port. Note Lomma trucks

Photo 10:
Photo taken through fence of Lomma equipment

Photo 11:
Photo of dumpster and garage - taken looking West

Photo 12:
Photo of parking lot in the north of property in the forground and truck port in the background

Photo 13:
Photo of Lomma flatbeds and equipment

Cellofilm 9/28/04

Photo 14:
Photo of Lomma flatbeds and equipment

Photo 15:
Entrance from Camelia Street

Photo 16:
Lomma trucks and equipment

Photo 17:
View of lot adjacent to the southern boundary of Cellofilm

M. Copenhaver
9/28/04

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PROJECT NOTE **REGION II SITE ASSESSMENT TEAM**

To: Cellofilm File **Date:** September 15, 2004 **Page:** 1 of 12

W.O. No.: 20103.001.001.1078.00

From: Michele Capriglione, Region II SAT

Subject: Site Latitude and Longitude

This project note documents the latitude and longitude of the Cellofilm site as calculated using the Standard Operating Procedure To Determine Site Latitude and Longitude Coordinates, USEPA, 1991.

Coordinates are as follows:
Latitude: 40° 44' 12.1"
Longitude: 74° 08' 15.26"

Michele Capriglione
Michele Capriglione

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APPENDIX E

STANDARD OPERATING PROCEDURE TO DETERMINE SITE LATITUDE AND LONGITUDE COORDINATES

HAZARDOUS SITE EVALUATION DIVISION
SITE ASSESSMENT BRANCH
U.S ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

September 1991

2

1. STATEMENT OF PROBLEM

Location information is critical to the site investigation process. This Standard Operating Procedure (SOP) describes the minimum standard to which latitudinal and longitudinal measurements should be recorded and how to obtain measurements from topographic maps. The investigator should complete a worksheet and attach supporting documentation, which record measurements and provide computations for review.

The purpose of this SOP is to provide a method to measure latitude and longitude which is accurate and practical. The procedure uses linear measurement and interpolation, referred to as Linear Interpolation (LI) to measure latitude and longitude. Compared to other techniques, LI:

- Requires only a single ruler or scale
- Requires no extrapolation of tangents or perpendiculars
- Requires no conversions or calculations, when using a scale graduated in seconds
- Is easy to learn
- Can be easily reviewed
- Is accurate to 1 second (± 0.5)

2. SITE REFERENCE POINT

The investigator should determine the site's geographic coordinates of a specified reference point. EPA's June 1989 draft policy simply requires describing the reference point for a site (e.g., northeast corner of site, entrance to facility, point of discharge). The January 1990 revision states: "...latitude and longitude coordinates may be made in reference to <u>any convenient aspect of a site</u>..." The language was intentionally vague due to the potentially infinite range of site spatial characteristics.

Latitude and longitude determination relies on 7.5-minute topographic maps published by the U.S. Geological Survey (USGS). At the scale of these maps (1:24,000), the small black square used to identify a single family dwelling is a little less in width than 1 second of latitude; the latitude and longitude of a house can be accurately determined to 1 second. When the building, facility, site, etc., is larger in width than 1 second, the question becomes, "From where should I take the measurement?" In some cases, the site could encompass hundreds of square miles, and several degrees or minutes of latitude. To specify a pair of geographic coordinates for the site location, a reference point must be determined for each site on a map for the official record.

To specify a single point location, remember that both natural and man-made features can change with time, and contamination can be documented outside a facility boundary. Property lines, water bodies, and buildings are particularly vulnerable to change. Give priority to the following situations when determining site reference points:

- Point representing the approximate center of the area of greatest concern or a major source as chosen by the project officer in the Region most familiar with the site; or
- Location of largest permanent structure, identified to the corner being measured.

On a 7.5-minute topographic map, mark the boundaries of the site, the area encompassing waste sources, with a very sharp pencil. If the site is a single point or building, use that point. If the building is large, select a corner and describe it for later worksheets. If the site is larger than a single building, draw a center line along the long axis (longest part) of the site (curving or segmenting the line so the line is always centered within the site), and designate the midpoint of the line as the center of the site. Mark this spot in pencil keeping the dot or cross-hair as fine as possible.

Choose a permanent site reference point that is accessible to field verification. During the site reconnaissance, verify the point location relative to topographic and physical structures on the map. Coordinates of known point locations (e.g., landfills, impoundments, wells) can also be calculated and recorded.

3. EQUIPMENT

The only equipment required for LI is an original version of the scale template, the Coordinator™ (see attached page), a fine mechanical pencil (0.3 or 0.5 mm), a large flat work surface, and the topographic map(s) containing the site. Mylar films of maps are preferable. Do not use folded or wrinkled field maps.

The accuracy of LI depends on several factors, specifically the accuracy of the map and measuring device, the width of the pencil, and the cartographic ability of the person making the measurements.

The accuracy of maps printed on paper is approximately 50 feet (1 millimeter map distance) due to paper shrinking or swelling in varying humidity, or by creases in the map. This error can be considerable at the 1:24,000 scale, but these problems can be overcome by using Mylar film versions of the USGS maps. Similarly, measuring tools can have different levels of precision. Do not use the Topo-Aid™, a map aid used in the past, which does not provide the 1-second precision now required by EPA.

A second area where precision can be lost is the pencil used to mark reference lines. The smaller the width of the scribe (or line drawn by the pencil), the greater the ability to align measurements to the ruler. If the width of the scribe is broader than the graduation marks on the ruler, precision cannot be greater than the width of the scribe or ruler calibration.

A third critical factor of accuracy is the cartographic ability of the measurer. There are basically two ways to measure latitude and longitude on maps. The first requires extrapolating data from the site reference point out to the map boundaries. This method requires moderate cartographic skill and accurate drafting supplies, and can magnify resulting errors in proportion to the map edge distance from the reference point. The second requires measuring data interpolated within known map reference points, thereby reducing drafting errors.

Methodologies that required drawing tangents from an unknown point on a map to the map boundary using straight-edges or right-triangles are no longer supported by EPA. The ability to align edges parallel to the map boundaries while extrapolating the tangent line is critical to the accuracy of the calculation. A difference of only a few millimeters will create coordinate errors of 1 or more seconds. Error will result from aligning the straight edge directly over the unknown point and not allowing for the width of the scribe while drawing the tangent line. Another way that locational error is introduced is by relying on other features inside the map -- such as straight roads, apparently straight survey lines, and section lines -- to extrapolate tangents.

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4. PROCEDURE

4.1 DEFINING THE GRID

Nine 2.5-minute map grid cells make up a USGS 7.5-minute topographic map (scale 1:24,000). These nine grid cells are defined by 2.5-minute tic marks at the edges of the map and 2.5-minute cross-hairs within the map. Determine which of the nine 2.5-minute grid cells contains the site center or reference point. Depending on the location of the grid, you will be required to draw two, three, or four framing lines. All measurements will be made within this grid. To draw the lines, align a straight edge so the point of the pencil will intersect two of the 2.5-minute cross-hairs. Be sure that the edge is not directly over the cross-hairs or the width of the pencil will be offset and the framing line will not exactly intersect the two cross-hairs (see Figure 4-1).

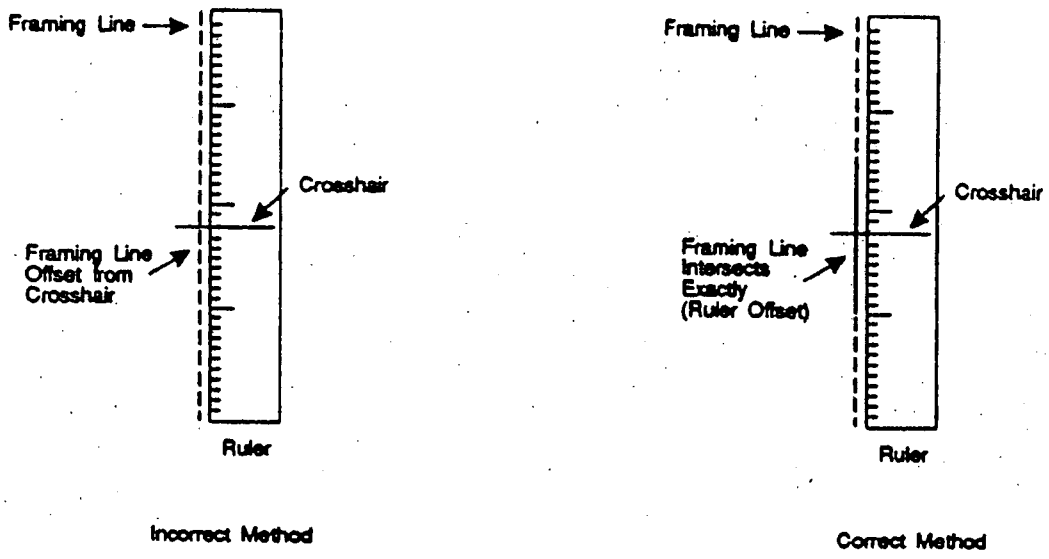

Figure 4-1. Aligning Framing Lines

Lightly draw the framing line, being careful to keep the pencil at an angle less than vertical, between 60 and 80 degrees. Strive to keep the pencil point against the straight edge at all times (see Figure 4-2).

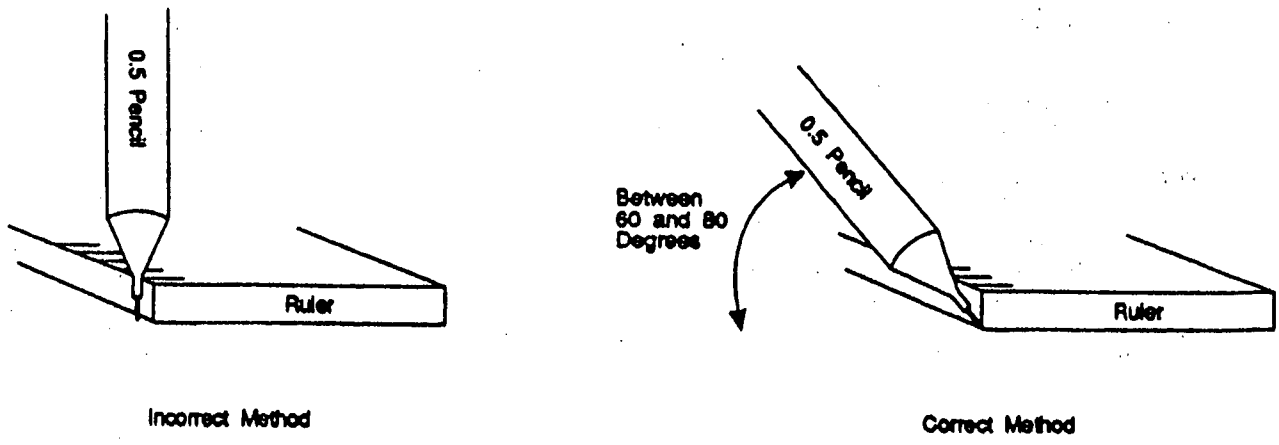

Figure 4-2. Scribing Framing Lines

After completing one of the lines, remove the straight edge and examine the line. If it does not intersect the center of the cross-hairs exactly on each end, erase the line completely and repeat the process.

NOTE: The corners of more recent 7.5 minute topographic maps may have dashed cross-hairs that differ slightly from the corners of the map. Measure from the corners of the map and not the dashed corner cross-hairs, a USGS correction for the 1983 datum. Most maps still rely on the 1927 datum. Consult the lower left legend of the map for more information on geodetic datum.

disregard this section

4.2 LI USING RULER GRADUATED IN SECONDS

The Coordinator™ is a clear template that is essentially eight custom rulers corresponding to the most common map scales. (The Coordinator™ can be obtained from drafting supply stores or 145 Cedar Hill Road, Bedford, NY 10506.) Other custom rulers can be used if the 1-second (or better) level of precision is maintained and documented.

Custom rulers are directly graduated in seconds of latitude. This is possible because map representations of latitude are essentially constant. One scale on the Coordinator™ fits precisely within a 2.5 minute arc of latitude on a 7.5 minute quadrangle map. By laying the scale over the site location precisely between the scribed latitude lines, latitude is read directly off the scale and added to the latitude of the lower line. With scale graduations in seconds, the accuracy of latitude to 1.0 second is ensured through direct measurement and interpolation. Directly measuring seconds prevents errors caused by conversion and ratio calculations.

<u>Measuring Latitude Using a Custom Ruler (Coordinator™)</u>

1. Set out Coordinator™ 1:24,000 scale and map with the site center or reference point identified.

2. Draw 2.5-minute framing lines around the grid with the site center or reference point (see Section 4.1).

3. Fill out background information on latitude/longitude worksheet.

4. Lay the scale on the map so that the bottom of the scale coincides with the bottom framing line and the top of the scale coincides with the top framing line (see Figure 4-3).

5. Move the scale laterally until it intersects the point to be measured. Be very careful to keep the top and bottom edges of the scale on the framing lines.

6. The scale has two sets of incremental designations; the left set begins at 30 seconds and the right set begins at 0 seconds. Use the scale that corresponds to the latitude number of the lower framing line. If it ends in 30 seconds, read along the left side. If it ends in 0 seconds, read along the right side.

7. Read up the scale from the lower framing line to the point to be measured. Note at each 00 second reading on the Coordinator Scale, add 1 minute to the beginning latitude number of the lower framing line. Record that number on the worksheet.

<u>Measuring Longitude Using a Custom Ruler (Coordinator™)</u>

Longitude is calculated using the same principle and scale as for latitude. The difference is that the ground distances of 2.5 minutes of latitude and longitude are not the same. If, however, you use the same scale and align your

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divisions to those of the known longitude lines, the ratios and conversions become a linear measurement. Since the scale is exactly 2.5 minutes long, place each end of the scale on one of the longitude lines. Next, slide the scale up or down until it intersects the reference point. When the edges of the scale are precisely touching the longitude lines and the scale intersects the unknown point, read up the scale from right to left to measure the longitude.

1. Set up longitude framing lines as described in Section 4.1.

2. Lay the 1:24,000 scale on the map so that the bottom of the scale coincides with the right framing line and the top of the scale coincides with the left framing line (see Figure 4-3).

3. Move the scale up or down until it intersects the point to be measured. Be very careful to keep the top and bottom edges of the scale on the framing lines.

4. The scale has two sets of increments: the left set begins at 30 seconds and the right set begins at 0 seconds. Use the scale that corresponds to the longitude number of the right framing line. If it ends in 30 seconds, read along the left side. If it ends in 0 seconds, read along the right side.

5. Read the scale up from the right framing line to the point to be measured. Note at each 00" on the Coordinator™ scale, add 1 minute to the beginning longitude number of the lower framing line. Record that number on the worksheet.

Note: Be sure to identify starting latitude and longitude from the lower right-hand corner of the 2.5 minute grid. If it ends in 30 seconds (30"), read off the 30-second side on the scale; if it ends in 00 seconds (00"), read off the 00 side.

* 4.3 LI USING AN ENGINEER'S SCALE

Alternative equipment to determine latitude and longitude coordinates is an "engineer's scale." An engineer's scale is a multi-sided ruler containing series of graduations per inch corresponding to map scales. For the 1:24,000 topographic maps, use the 60 divisions per inch scale; on this scale 454 divisions equal to 2.5 minutes. Use the 0 as 00" and 454 as 2'30" and follow the alignment process of Section 4.2. Record the number of divisions on the ruler, divide by 454 and multiply the resultant by 150. The number is now in seconds and can be added to the starting latitude or longitude to get the coordinates of the site.

<u>Measuring Latitude and Longitude Using an Engineer's Scale</u>

1. Display the 1/60 engineer's scale and map with the site center or reference point site identified.

2. Draw 2.5-minute framing lines on the grid with the site center or reference point (see Section 4.1).

3. Fill out background information on the latitude/longitude worksheet.

4. For latitude: place the 1/60 scale on the map so that the bottom of the ruler coincides with the bottom framing line and 454 coincides with the top framing line (see Figure 4-3).

   For longitude: place the scale on the map so that the bottom of the ruler coincides with the right framing line and 454 coincides with the left framing line (see Figure 4-3).

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5. Move the scale laterally (for latitude) or vertically (for longitude) until the scale intersects the point to be measured. Be very careful to keep the 0 and 454 edges of the scale on the framing lines.

6. Record the number on the ruler where it intersects the point to be measured on the appropriate worksheet. Divide that number by 454 and multiply the resultant by 150. OR multiply the number by 0.3304. The number is now in seconds and can be added to the starting latitude or longitude of the grid to get the latitude or longitude coordinates of the site. Complete the worksheet.

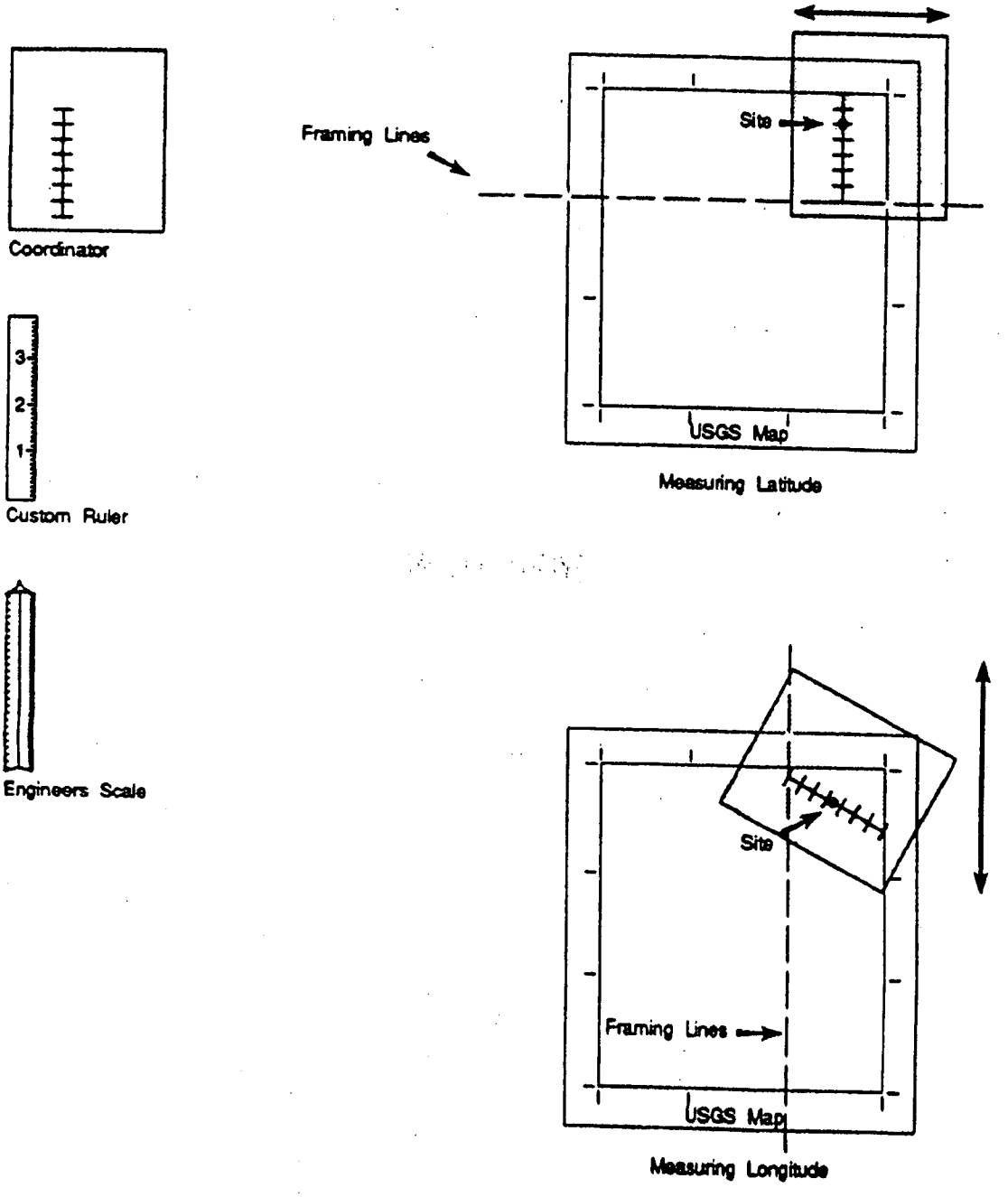

Figure 4-3. Determining Latitude and Longitude Using Linear Interpolation

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5. QUALITY ASSURANCE

For QA purposes, a method must be developed to track how latitude and longitude coordinates have been verified and calculated. A datasheet (worksheet) is part of the required documentation for each PA. A completed worksheet allows a reviewer to follow the original steps and check the calculations. Completing each form is estimated to take approximately 10 minutes. Attach a complete 2.5-minute grid on a separate page with the site center or reference point clearly marked. All four corners of the grid must be clearly visible.

LATITUDE AND LONGITUDE CALCULATION WORKSHEET #1
LI USING CUSTOM RULER OR COORDINATOR™

SITE NAME: _____ CERCLIS #: _____

AKA: _____ SSID: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

SITE REFERENCE POINT: _____

USGS QUAD MAP NAME: _____ TOWNSHIP: ____ N/S RANGE: ____ E/W

SCALE: 1:24,000 MAP DATE: _____ SECTION: ____1/4 ____1/4 ____1/4

MAP DATUM: 1927 1983 (CIRCLE ONE) MERIDIAN: _____

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 7.5' MAP (attach photocopy):

LONGITUDE: ____° ____' ____" LATITUDE: ____° ____' ____"

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 2.5' GRID CELL:

LONGITUDE: ____° ____' ____" LATITUDE: ____° ____' ____"

CALCULATIONS: LATITUDE (7.5' QUADRANGLE MAP)

A) ALIGN THE BOTTOM OF THE SCALE WITH BOTTOM OF GRID. ALIGN THE TOP OF THE SCALE WITH THE TOP OF GRID. POSITION EDGE OF RULER OVER SITE REFERENCE POINT WHILE KEEPING TOP AND BOTTOM ALIGNED.

B) READ TICS ON RULER AT 1- OR 0.5-SECOND INTERVALS (INTERPOLATE).

C) EXPRESS IN MINUTES AND SECONDS (1'= 60"): ____'____.____"

D) ADD TO STARTING LATITUDE: ____°____'____.____" + ____'____.____ =

SITE LATITUDE: ____°____'____.____"

CALCULATIONS: LONGITUDE (7.5' QUADRANGLE MAP)

A) ALIGN THE BOTTOM OF THE SCALE WITH RIGHT SIDE OF GRID. ALIGN THE TOP OF THE SCALE WITH THE LEFT SIDE OF GRID. POSITION EDGE OF RULER OVER SITE REFERENCE POINT WHILE KEEPING TOP AND BOTTOM ALIGNED.

B) READ TICS ON RULER AT 1- or 0.5-SECOND INTERVALS. (INTERPOLATE)

C) EXPRESS IN MINUTES AND SECONDS (1'= 60"): ____'____.____"

D) ADD TO STARTING LONGITUDE: ____°____'____.____" + ____'____.____ =

SITE LONGITUDE: ____°____'____.____"

INVESTIGATOR: _____ DATE: _____

LATITUDE AND LONGITUDE CALCULATION WORKSHEET #2
LI USING ENGINEER'S SCALE (1/60)

SITE NAME: Cellofilm Corporation CERCLIS #: NJD000813451

AKA: _____ SSID: _____

ADDRESS: 45-5 Cornelia St

CITY: Newark STATE: NJ ZIP CODE: _____

SITE REFERENCE POINT: Site Center

USGS QUAD MAP NAME: Elizabeth TOWNSHIP: ___ N/S RANGE: ___ E/W

SCALE: 1:24,000 MAP DATE: 1995 SECTION: ___ 1/4 ___ 1/4 ___ 1/4

MAP DATUM: 1927 1983 (CIRCLE ONE) MERIDIAN: _____

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 7.5' MAP (attach photocopy):

LONGITUDE: 74° 07' 30" LATITUDE: 40° 37' 30"

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 2.5' GRID CELL:

LONGITUDE: 74° 07' 30" LATITUDE: 40° 42' 30"

CALCULATIONS: LATITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM LATITUDE GRID LINE TO SITE REF POINT: 309

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS:

A x 0.3304 = 102.1"

C) EXPRESS IN MINUTES AND SECONDS (1' = 60"): 1' 42.1"

D) ADD TO STARTING LATITUDE: 40° 42' 30.__" + 1' 42.1" =

SITE LATITUDE: 40° 44' 12.1"

CALCULATIONS: LONGITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM RIGHT LONGITUDE LINE TO SITE REF POINT: 137

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS:

A x 0.3304 = 45.26"

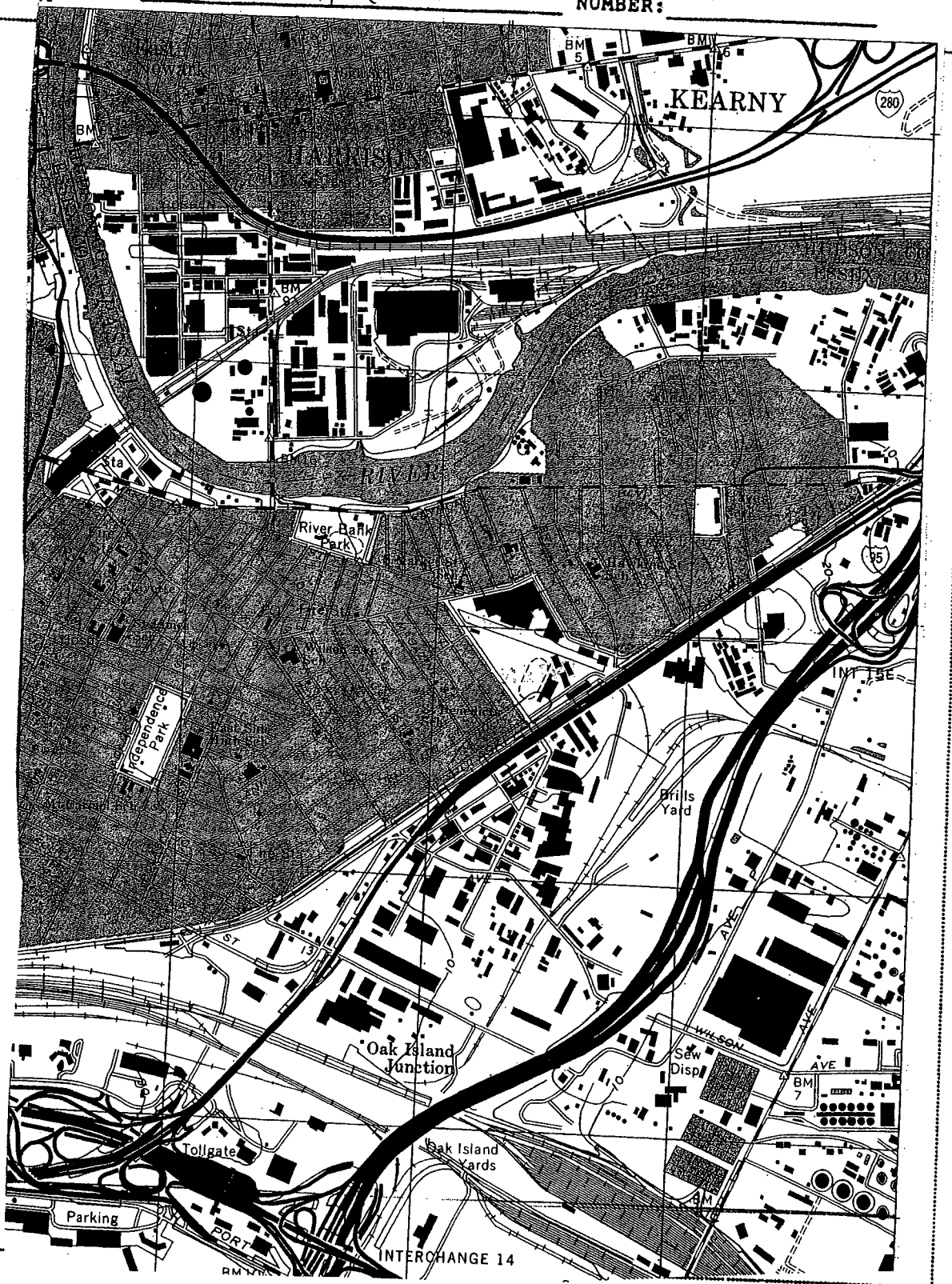
C) EXPRESS IN MINUTES AND SECONDS (1' = 60"): ___' 45.26"

D) ADD TO STARTING LONGITUDE: 74° 07' 30.__" + ___' 45.26" =

SITE LONGITUDE: 74° 08' 15.26"

INVESTIGATOR: [illegible] DATE: 9/15/04

SITE NAME: Cellofilm NUMBER:



TOPOGRAPHIC MAP QUADRANGLE NAME: Elizabeth SCALE: 1:24,000

COORDINATES OF LOWER RIGHT-HAND CORNER OF 2.5-MINUTE GRID:

LATITUDE: 74. 07. 30. LONGITUDE: 40. 42. 30

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Reference 6

NUS CORPORATION
A Halliburton Company

FIELD INVESTIGATION TEAM ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCES FACILITIES — ZONE I

NUS CORPORATION
SUPERFUND DIVISION

1

02-8904-27-PA
REV. NO. 0

FINAL DRAFT
PRELIMINARY ASSESSMENT
CELLOFILM CORPORATION
NEWARK, NEW JERSEY

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-8904-27
CONTRACT NO. 68-01-7346

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

JUNE 8, 1989

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY:

RICHARD FEINBERG
PROJECT MANAGER

EDMUND KNYFD JR.
SITE MANAGER

REVIEWED/APPROVED BY:

RONALD M. NAMAN
FIT OFFICE MANAGER

(2)

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

PART I: SITE INFORMATION

1. Site Name/Alias Cellofilm Corporation

   Street 45-5 Cornelia Street

   City Newark State New Jersey Zip 07105

2. County Essex County Code 013 Cong. Dist. 10

3 EPA ID No. NJD000813451

4. Latitude 40° 44′ 12″ N Longitude 74° 08′ 15″ W

   USGS Quad. Elizabeth, New Jersey

5. Owner Cellofilm Corporation Tel. No. (201) 438-7100

   Street 241 Union Avenue

   City Wood Ridge State NJ Zip 07075

6. Operator Cellofilm Corporation Tel. No. (201) 589-3871

   Street 45-5 Cornelia Street

   City Newark State NJ Zip 07105

7. Type of Ownership

   ☒ Private ☐ Federal ☐ State
   ☐ County ☐ Municipal ☐ Unknown ☐ Other _____

8. Owner/Operator Notification on File

   ☒ RCRA 3010 Date 11/19/80 ☐ CERCLA 103c Date _____
   ☐ None ☐ Unknown

9. Permit Information

Permit	Permit No.	Date Issued	Expiration Date	Comments

10. Site Status

    ☒ Active ☐ Inactive ☐ Unknown

11. Years of Operation 1973 to Present

12. Identify the types of waste units (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Management Areas

Waste Unit No.	Waste Unit Type	Facility Name for Unit
1	55-Gallon Drums	Drum Storage Area

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.

A RCRA inspection performed on 5-27-81 indicated that some 55-gallon drums were rusted, leaking, overfilled, or punctured. Because of the poor condition of the 55-gallon drums on site, the EPA served a complaint and civil penalty against Cellofilm Corporation for violating 40 CFR § 265.171 and 40 CFR § 265.173(b). The suspected hazardous wastes on site include alkyd resins, flammable blanket wash product, and waste oil sludges.

13. Information available from

Contact Amy Brochu Agency U.S. EPA Tel. No. (201) 906-6802

Preparer Edmund Knyfd Jr. Agency NUS Corp. Region 2 FIT Date June 7, 1989

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 1 - 55-Gallon Drums, Drum Storage Area

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   On November 19, 1980, Cellofilm Corporation had applied for classification as a treatment, storage or disposal facility (TSD). On July 7, 1982, Cellofilm Corporation refiled as a generator status facility after review of their operations indicated that they were not operating as a TSD facility. On October 24, 1983, Cellofilm Corporation was officially reclassified from a TSD facility to a generator facility. A RCRA inspection performed on 5-27-81 indicated that some 55-gallon drums were rusted, leaking, overfilled, or punctured. Because of the poor condition of the 55-gallon drums on site, the EPA served a complaint and civil penalty against Cellofilm Corporation for violating 40 CFR § 265.171 and 40 CFR § 265.173 (b).

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The waste unit is essentially the entire fenced-in area that surrounds Cellofilm's offices, and contains many 55-gallon drums of waste.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   During an inspection of the facility by the State of New Jersey Department of Environmental Protection it was noted that eight 55-gallon drums of hazardous substances were present in the drum storage area. During a FIT 2 off-site reconnaissance on April 20, 1989, drums were observed in many locations on the site; however, it is not known whether any or all of these drums contain hazardous waste.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical states of the waste type as disposed of in the waste unit can be categorized as liquids and sludge.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The specific hazardous substances known or suspected to be present in the waste unit include acetone, n-butyl alcohol, di-n-octyl phthalate, ethyl acetate, methanol, methyl ethyl ketone, toluol, methyl isobutyl ketone, xylene, and di-butyl phthalate.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The wastes are stored in 55-gallon drums, some stacked on pavement adjacent to Cornelia Street, and the rest stacked on unpaved ground along the west side of the facility by the railroad tracks. The potential for contaminant migration via surface water appears likely as evidenced by photographs P_3 and P_4 taken during the off-site reconnaissance, which show the stained sidewalk along Cornelia Street and adjacent to the waste drum storage. It is suspected that unknown contents leaking from the waste drums are being transported off site by surface water runoff onto the sidewalk and street. The RCRA inspection performed on 5-27-81 indicated the presence of rusted, leaking, overfilled, or punctured 55-gallon drums on site. Consequently, the EPA served a complaint and civil penalty against Cellofilm Corporation for violating 40 CFR § 265.171 and 40 CFR § 265.173 (b).

The potential for contaminant migration via groundwater may be likely for the waste drum storage along the railroad tracks because the drums are stored directly on the ground. Observations during the off-site reconnaissance indicated waste drums in generally poor condition and the appearance of stains on the gravel area adjacent to the railroad tracks. The poor drum conditions and stains on the sidewalk may indicate that there could be contaminant migration via an air route.

Ref. Nos. 1; 2; 3; 4; 5; 6; 8; 9; 10, pp. 1-6

PART III: HAZARD ASSESSMENT

GROUNDWATER ROUTE

1. **Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

   There has been no observed or alleged release of contaminants to the groundwater attributable to this site. However, the potential for a release of contaminants to the groundwater may exist as evidenced by the appearance of stains on the gravel area adjacent to the railroad tracks. The RCRA inspection performed on 5-27-81 indicated the presence of rusted, leaking, overfilled, or punctured 55-gallon drums which could release contaminants onto the soil and create a potential for groundwater contamination. Observations during the off-site reconnaissance indicated that some drums may be leaking as evidenced by stains on the sidewalk next to the drum storage area. The suspected contaminants on site are acetone, n-butyl alcohol, di-n-octyl phthalate, ethyl acetate, methanol, methyl ethyl ketone, toluol, methyl isobutyl ketone, xylene, and di-butyl phthalate.

   Ref. Nos. 4; 5; 9; 10, pp. 1-6

2. **Describe the aquifer of concern; include information such as depth, thickness, geologic composition, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

   In the Newark area there are two major aquifers of concern: 1) Pleistocene glacial deposits, and 2) Triassic Age Brunswick Formation. Bedrock in the Newark area is overlain by unconsolidated deposits of glacial origin. These deposits consist generally of till, clay, or stratified drift. In places, these surficial deposits are thick and permeable, and are commonly in direct hydraulic connection with the underlying bedrock and adjacent streams, rivers, and lakes. The thickness of these deposits can range from a feather edge in the western Newark area to as much as 300 feet in the eastern Newark area and into Harrison. In the area of the site these deposits are approximately 120 feet in thickness. This also implies that the bedrock is found at a depth of approximately 120 feet. The Newark area is almost entirely underlain by the sedimentary Brunswick Formation. The Triassic Age Brunswick Formation consists of thousands of feet of red shale, with some conglomerate, sandstone, siltstone, basalt, and diabase. Its primary permeability is low, but appreciable amounts of water are found in joints and fractures. However, unless a significant number of these joints and fractures are penetrated by a well, yields can be relatively small. The direction of highest permeability and of the greatest movement of water in response to pumping tends to parallel the strike of the beds, generally southwest to northeast. In general, the principal water-bearing zone of the Triassic rocks ranges from less than 200 feet to 600 feet in depth. High-yield wells tapping this aquifer in Essex County are between 300-400 feet deep.

   Ref. Nos. 11, pp. 1-52; 14, pp. 4, 19-20, 28-29

3. **Is a designated sole source aquifer within 3 miles of the site?**

   No, a sole source aquifer is not within 3 miles of the site.

   Ref. Nos. 12, 13

4. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

   Available information indicates that the water level in the aquifer of concern varies greatly over short distances, and appears to be related to the contour of the underlying bedrock

surface. Based on available information the estimated water level in the area has been recorded at as shallow as 30 feet and as deep as 227 feet. Since waste disposal/storage is at ground level, the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern is estimated to be 30 feet.

Ref. Nos. 14, p. 20; 19; 26, pp. 1-4, 19, 43, 45

5. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?**

The least permeable continuous intervening stratum between the ground surface and the aquifer of concern is the Pleistocene Age glacial deposits. These deposits generally consist of stratified drift, clay, and till. The lithology of these deposits can change drastically within an area of 100 feet, but the highest permeability found in these deposits occurs where they contain coarse sand and gravel. The permeability value of these deposits is in the range of 10^{-3} - 10^{-5} cm/sec.

Ref. Nos. 11, pp. 1-52; 14, pp. 4, 19-20, 28-29; 15, p. 15

6. **What is the net precipitation for the area?**

The net precipitation for the area is approximately 13 inches annually.

Ref. No. 15, pp. 13-14

7. **Identify uses of groundwater within 3 miles of the site (i.e., private drinking source, municipal source, commercial, industrial, irrigation, unusable).**

The use of groundwater within a 3-mile radius of the site is for industrial cooling, air-conditioning, general processing, and sanitary purposes.

Ref. No. 11, p. 9

8. **What is the distance to and depth of the nearest well that is currently used for drinking or irrigation purposes?**

There is a well suspected to be owned by the U.S. Navy located approximately 1 mile southwest of the site; it is believed to be used for industrial purposes. No wells in the city of Newark are believed to be used for public supply drinking or irrigation.

Distance N/A **Depth** N/A

Ref. Nos. 16, 26, 28, 31

9. **Identify the population served by the aquifer of concern within a 3-mile radius of the site.**

No population is served by the aquifer of concern for potable purposes within a 3-mile radius of the site.

Ref. No. 17

SURFACE WATER ROUTE

10. **Describe the likelihood of a release of contaminant(s) to surface water as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminants to the facility.** There is no record of an observed or alleged release of contaminants to surface water. Photographs taken during the off-site reconnaissance showed the stained sidewalk along Cornelia Street, adjacent to the waste drum storage. It is suspected that unknown contents leaking from the waste drums are being transported off site by surface water runoff onto the sidewalk and street. There may be a potential for contaminants to enter surface water via the city storm sewer system and ultimately be discharged into the Passaic River. The suspected contaminants include acetone, n-butyl alcohol, di-n-octyl phthalate, ethyl acetate, methanol, methyl ethyl ketone, toluol, methyl isobutyl ketone, xylene, and di-butyl phthalate.

    Ref. Nos. 4, 9, 18

11. **Identify and locate the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.**

    The nearest downslope surface water would be the Passaic River. It is believed that the possible surface drainage pattern would be off site into the storm sewers located on Cornelia Street and Albert Avenue and eventual discharge into the Passaic River near the New Jersey Turnpike.

    Ref. Nos. 10, pp. 1-6; 19; 29; 30

12. **What is the facility slope in percent? (Facility slope is measured from the highest point of deposited hazardous waste to the most downhill point of the waste area or to where contamination is detected.)**

    The facility slope is estimated to be less than 1 percent.

    Ref. Nos. 10, pp. 1-6; 19

13. **What is the slope of the intervening terrain in percent? (Intervening terrain slope is measured from the most downhill point of the waste area to the probable point of entry to surface water.)**

    The slope of the intervening terrain is estimated to be less than 1 percent.

    Ref. Nos. 10, pp. 1-6; 19

14. **What is the 1-year 24-hour rainfall?**

    The 1-year 24-hour rainfall is estimated to be 2.75 inches.

    Ref. No. 15, p. 33

15. **What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.**

    The distance to the nearest downslope surface water, the Passaic River, would be approximately 1.1 mile. This drainage route would be through the storm sewer system.

    Ref. Nos. 19, 29, 30

16. Identify uses of surface waters within 3 miles downstream of the site (i.e., drinking, irrigation, recreation, commercial, industrial, not used).

The Hackensack River, Hackensack Meadowlands, and Passaic River are all tidal within 3 miles of the site. Surface water uses include maintenance, migration, and propagation of the natural and established biota; migration of diadromous fish; maintenance and migration of fish population; maintenance of wildlife; secondary contact recreation; and any other reasonable uses.

Ref. Nos. 20, pp. 3-5; 21, pp. 5-6, 27; 32

17. Describe any wetlands, greater than 5 acres in area, within 2 miles downstream of the site. Include whether it is a freshwater or coastal wetland.

Within 2 miles downstream of the site, at the south tip of Kearny Point, is a tidal flat which is a coastal wetland.

Ref. Nos. 19, 27

18. Describe any critical habitats of federally listed endangered species within 2 miles of the site along the migration path.

There are no critical habitats of federally listed endangered species within 2 miles of the site along the migration path. However, the Hackensack Meadowlands is a nesting area for herons and ibises; and Newark Bay is a nesting area for least terns. These birds are not federally listed endangered species in the Newark, New Jersey area.

Ref. Nos. 22, 23

19. What is the distance to the nearest sensitive environment along or contiguous to the migration path (if any exist within 2 miles)?

The nearest sensitive environments along or contiguous to the migration path include a tidal flat at the tip of Kearny Point and tidal areas of the southern portion of the Hackensack Meadowlands.

Ref. Nos. 19, 27, 32

20. Identify the population served or acres of food crops irrigated by surface water intakes within 3 miles downstream of the site and the distance to the intake(s).

No surface water intakes exist within a 3-mile radius of the site.

Ref. No. 24

21. What is the state water quality classification of the water body of concern?

The water bodies of concern, the Hackensack River, Passaic River, and the Newark Bay, have state water quality classifications of SE2, SE3, and SE3, respectively.

Ref. Nos. 20, pp. 3-5; 21, pp. 5-6, 27

22. Describe any apparent biota contamination that is attributable to the site.

No apparent biota contamination was noted or observed during the off-site reconnaissance, although numerous stains were observed on soils.

Ref. Nos. 4, 10

AIR ROUTE

23. Describe the likelihood of a release of contaminant(s) to the air as follows: observed, alleged, potential, none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.

No observed or alleged release of contaminants to the air has been documented. It is believed that there is a potential for contaminant migration via an air route. The staining on the sidewalk adjacent to the drum storage area may represent the potential for contaminants to be exposed to air and thereby be susceptible to migration via air currents. The suspected contaminants include acetone, n-butyl alcohol, di-n-octyl phthalate, ethyl acetate, methanol, methyl ethyl ketone, toluol, methyl isobutyl ketone, xylene, and di-butyl phthalate.

Ref. Nos. 4; 5; 10, pp. 1-6

24. What is the population within a 4-mile radius of the site?

Within a 4-mile radius of the site the population is 480,200.

Ref. No. 25

FIRE AND EXPLOSION

25. Describe the potential for a fire or explosion to occur with respect to the hazardous substance(s) known or suspected to be present on site. Identify the hazardous substance(s) and the method of storage or containment associated with each.

There is a potential for fire or explosion to occur with respect to the hazardous substances on site as the substances are ignitable, corrosive, and toxic. These substances are flammable blanket wash material in 1-gallon cans and flammable alkyd resins and solvents in 55-gallon drums. These 1-gallon cans are reportedly rusted through and 55-gallon drums have been leaking in the past. The suspected hazardous substances on site include acetone, n-butyl alcohol, di-n-octyl phthalate, ethyl acetate, methanol, methyl ethyl ketone, toluol, methyl isobutyl ketone, xylene, and di-butyl phthalate.

Ref. Nos. 1, 9

26. What is the population within a 2-mile radius of the hazardous substance(s) at the facility?

The population within a 2-mile radius of the hazardous substances at the facility is 77,200.

Ref. No. 25

DIRECT CONTACT/ON-SITE EXPOSURE

27. Describe the potential for direct contact with hazardous substance(s) stored in any of the waste units on site or deposited in on-site soils. Identify the hazardous substance(s) and the accessibility of the waste unit.

There is a potential for direct contact with hazardous substances stored in 55-gallon drums on site as evidenced by apparent leaking onto, and staining of the ground and sidewalk adjacent to the site. The waste unit is accessible via a gate that is usually open during working hours. The suspected hazardous substances on site include acetone, n-butyl alcohol, di-n-octyl phthalate, ethyl acetate, methanol, methyl ethyl ketone, toluol, methyl isobutyl ketone, xylene, and di-butyl phthalate.

Ref. Nos. 9; 10, pp. 1-6

28. How many residents live on a property whose boundaries encompass any part of an area contaminated by the site?

No residents live on a property whose boundaries encompass any part of an area known to be contaminated by the site.

Ref. No. 19

29. What is the population within a 1-mile radius of the site?

The population within a 1-mile radius of the site is 12,600.

Ref. No. 25

PART IV: SITE SUMMARY AND RECOMMENDATIONS

The Cellofilm Corporation is a privately owned active site, approximately 1.45 acres in size, located 1500 feet south of the Passaic River in the city of Newark, Essex County, New Jersey. The site is located in an industrial area bounded by Lister Avenue to the north, Cornelia Street to the east, Albert Avenue to the south, and an industrial building and railroad tracks to the west.

This facility is operated by a trucking firm which transports finished products from a facility that manufactures industrial resins and coatings. Small quantities of hazardous waste are generated when tank truck compartments are washed with xylene, toluol, and/or n-butyl alcohol to avoid cross-contamination between the various products being transported. To maintain compliance with the RCRA Generator permit, hazardous wastes are removed from the site within 90 days of their generation by an authorized waste hauler for proper disposal. The washings of the tank truck compartments are discharged into the city sewer system, treated in the regional sewage treatment plant, and eventually discharged a couple of miles out into Newark Bay.

On May 27, 1981, the New Jersey Department of Environmental Protection performed an inspection at the facility, and it was noted that a number of containers were rusted and some were leaking hazardous wastes onto the ground. These leaking wastes included alkyd resins and flammable blanket wash material. It was also noted that some containers were overfilled with waste resins which were leaking onto the soil. As a consequence of this inspection, on September 29, 1981, the U.S. EPA Region II filed a "Complaint, compliance order, and notice of opportunity for hearing" against Cellofilm Corporation. An off-site reconnaissance conducted by NUS Corp. on April 20, 1989 found stains on the sidewalk adjacent to the hazardous waste drum storage area. These stains could represent the potential for direct contact with hazardous substances. The stains also represent potential for contaminant migration via surface water and air routes. Contaminants could migrate via surface water runoff into the city storm sewer system and potentially discharge into the Passaic River. Groundwater and surface water in the area is not used for potable purposes, but the potential threat of contamination could negatively affect the biota dependent on groundwater and surface water in the area. Contaminants that may have leaked from drums onto the adjacent sidewalk represent the potential for exposure to air and thereby may become susceptible to migration via air currents. The potential for a fire or explosion to occur does exist because ignitable, corrosive, and toxic substances are contained on site as flammable blanket wash material in 1-gallon cans and flammable alkyd resins and solvents in 55-gallon drums..

Based on the past facility inspection which found 55-gallon drums in poor and leaking condition, and the recent off-site reconnaissance which found staining on the sidewalk adjacent to the drum storage area, this site is recommended for a **MEDIUM PRIORITY** site inspection. During the

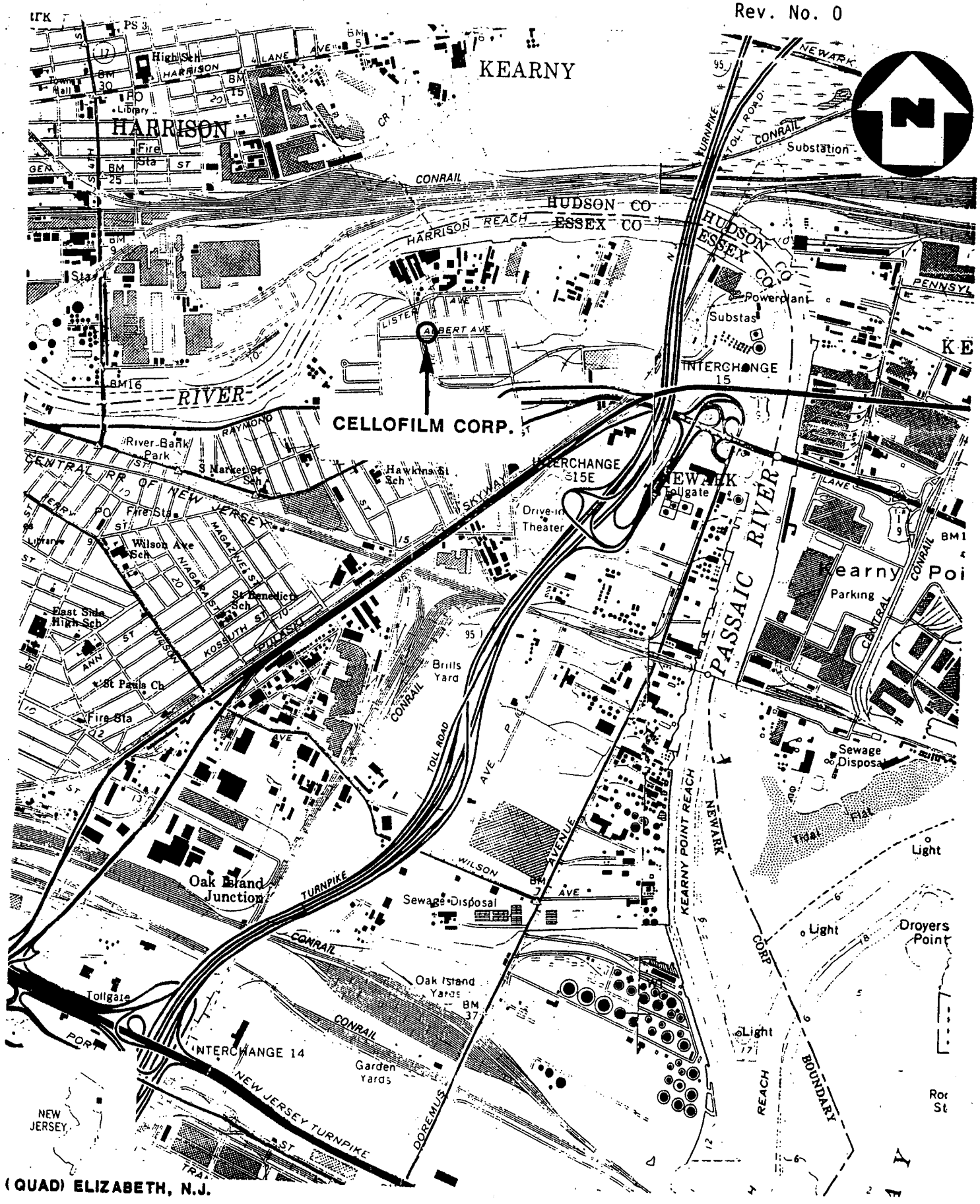
inspection it should be determined whether or not the 55-gallon drums are leaking. The 55-gallon drums containing flammable alkyd resins and solvents, and 1-gallon cans containing flammable blanket wash material should be sampled to determine the exact hazardous substances present in them. Soil sampling should be performed to determine whether the soil has been contaminated, and air sampling should be performed around the perimeter of the site to determine if contaminants are migrating off site via an air route.

ATTACHMENT 1

CELLOFILM CORPORATION
45-5 CORNELIA STREET, NEWARK, NEW JERSEY

CONTENTS

Figure 1: Site Location Map
Figure 2: Site Map
Exhibit A: Photograph Log



(QUAD) ELIZABETH, N.J.

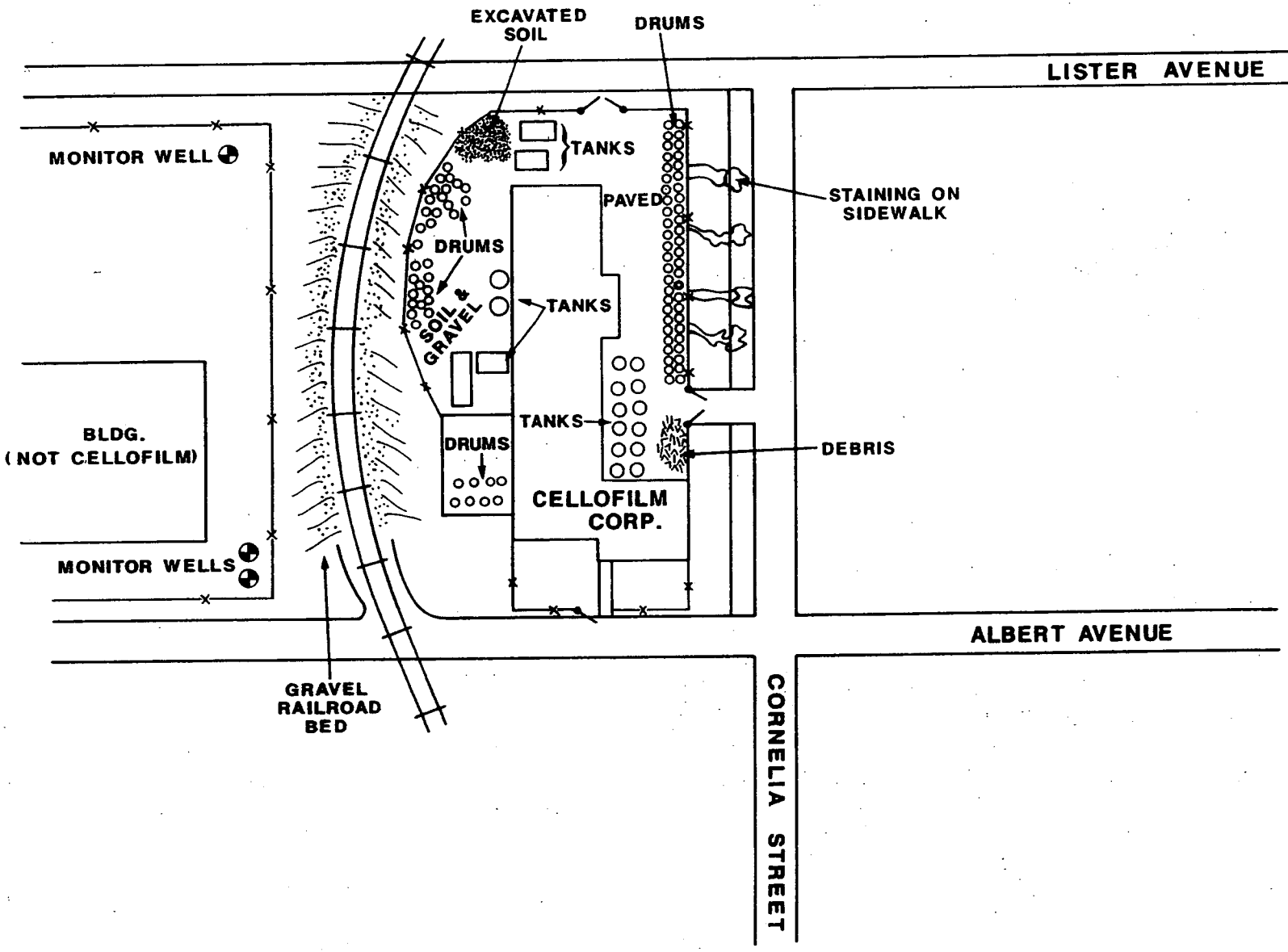
SITE LOCATION MAP

CELLOFILM CORP., NEWARK, N.J.

SCALE: 1"= 2000'

FIGURE 1

NUS CORPORATION



(18)

Rev. No. 0

FIGURE 2

SITE MAP

CELLOFILM CORP., NEWARK, N.J.

(NOT TO SCALE)

NUS CORPORATION

EXHIBIT A

PHOTOGRAPH LOG

CELLOFILM CORPORATION
45-5 CORNELIA STREET, NEWARK, NEW JERSEY

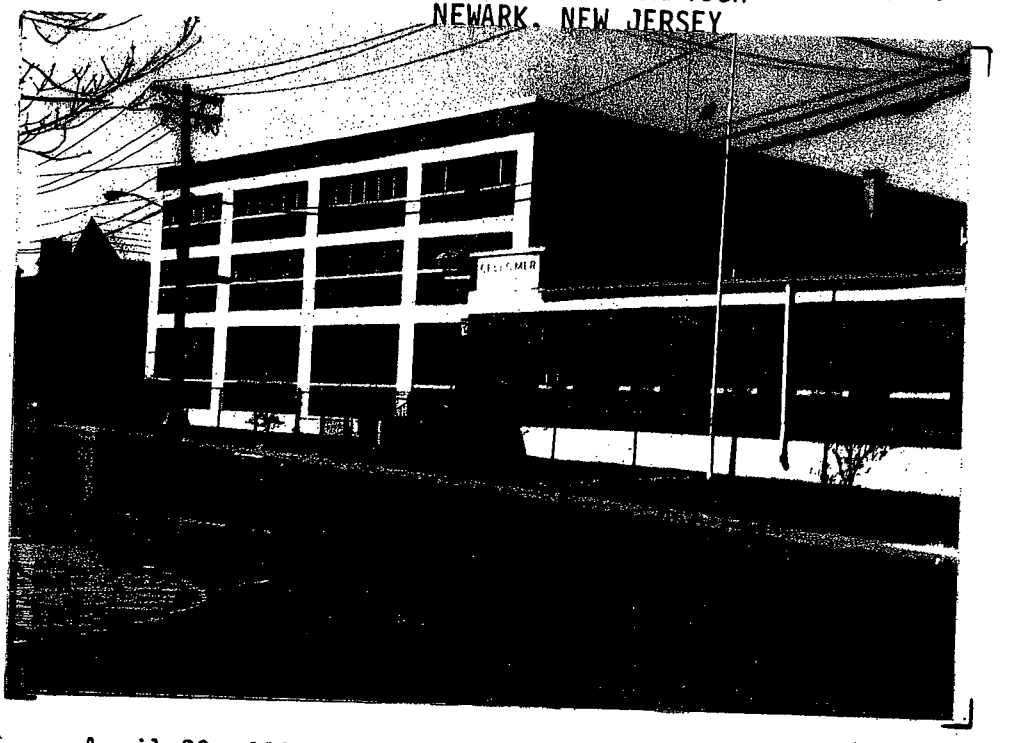
OFF-SITE RECONNAISSANCE: APRIL 20, 1989

CELLOFILM CORPORATION
45-5 CORNELIA STREET, NEWARK, NEW JERSEY
APRIL 20, 1989

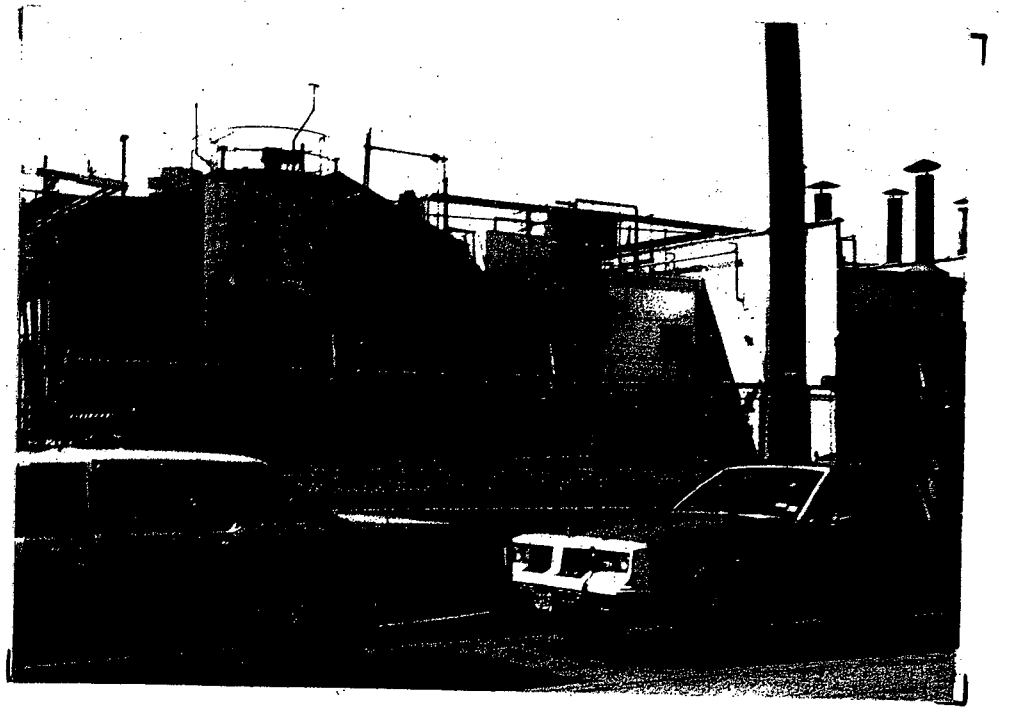
PHOTOGRAPH INDEX

ALL PHOTOGRAPHS TAKEN BY JOHN HARRISON

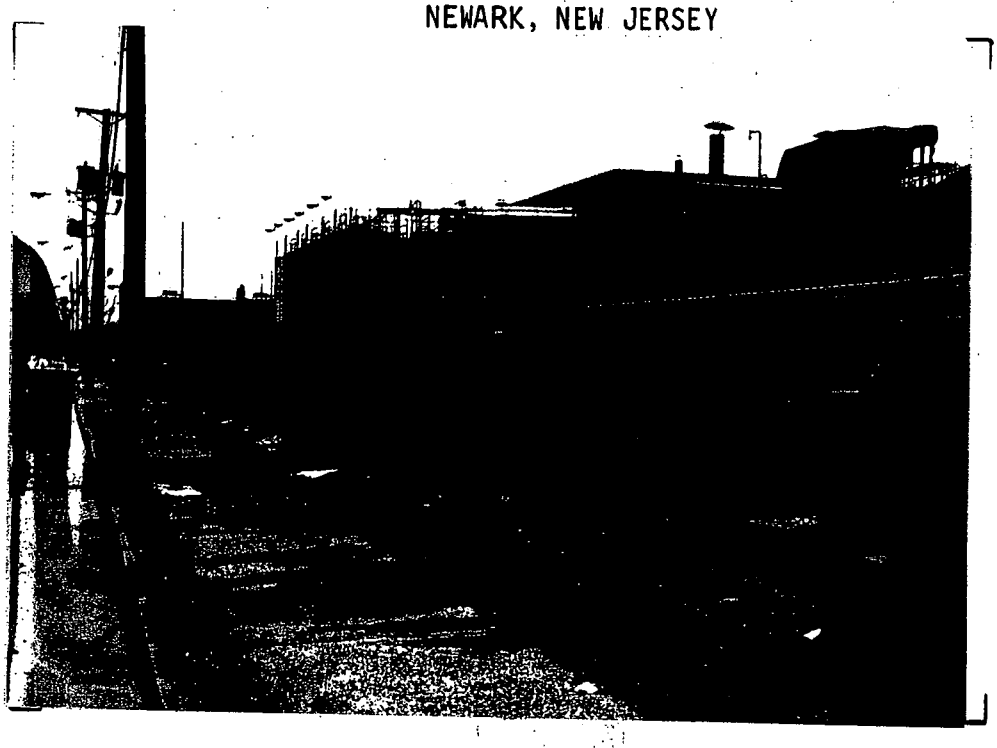
Photo Number	Description	Time
R3 P1 S1	Front of office looking NW from corner of Cornelia and Albert Streets.	1355
R3 P2 S2	Looking west at side and back of office, process building and tanks.	1359
R3 P3 S3	Looking south along Cornelia Street at drum storage and stained sidewalk.	1402
R3 P4 S4	Looking north along Cornelia Street at drum storage and stained sidewalk.	1404
R3 P5 S5	Looking SE from Lister Ave. at drum storage and excavated soil.	1407
R3 P6 S6	Looking SE from Lister Ave. at drum storage, process tanks, and railroad tracks.	1410
R3 P7 S7	Looking at west side of office at indoor drum storage from Cornelia Street.	1415



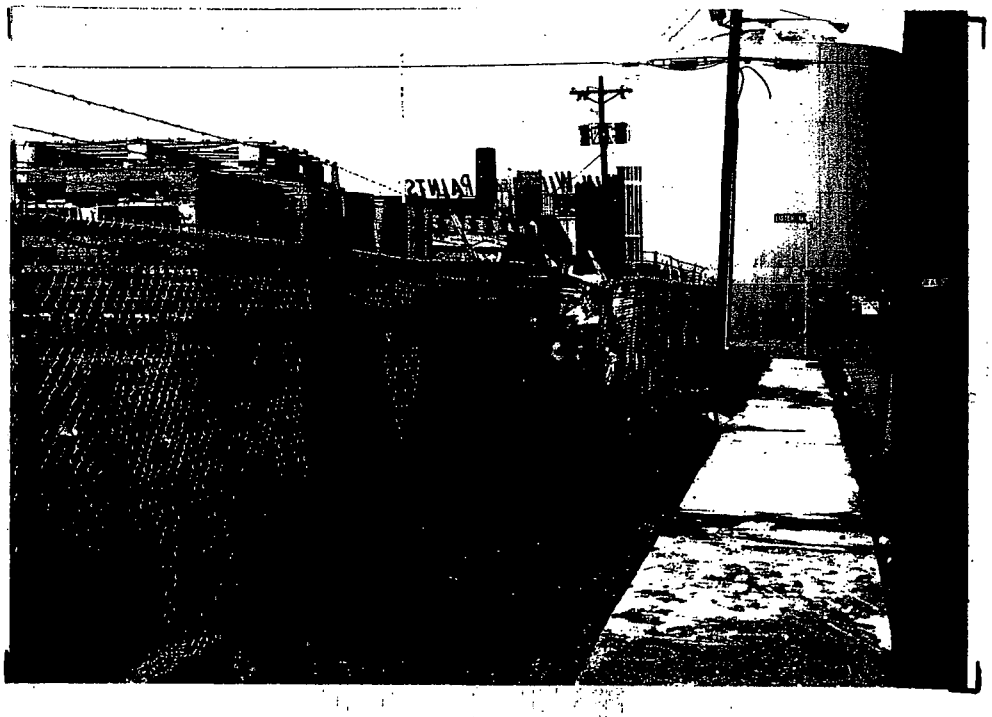
R3 P1 S1 April 20, 1989 1355
Front of office looking NW from corner of Cornelia and Albert Streets.



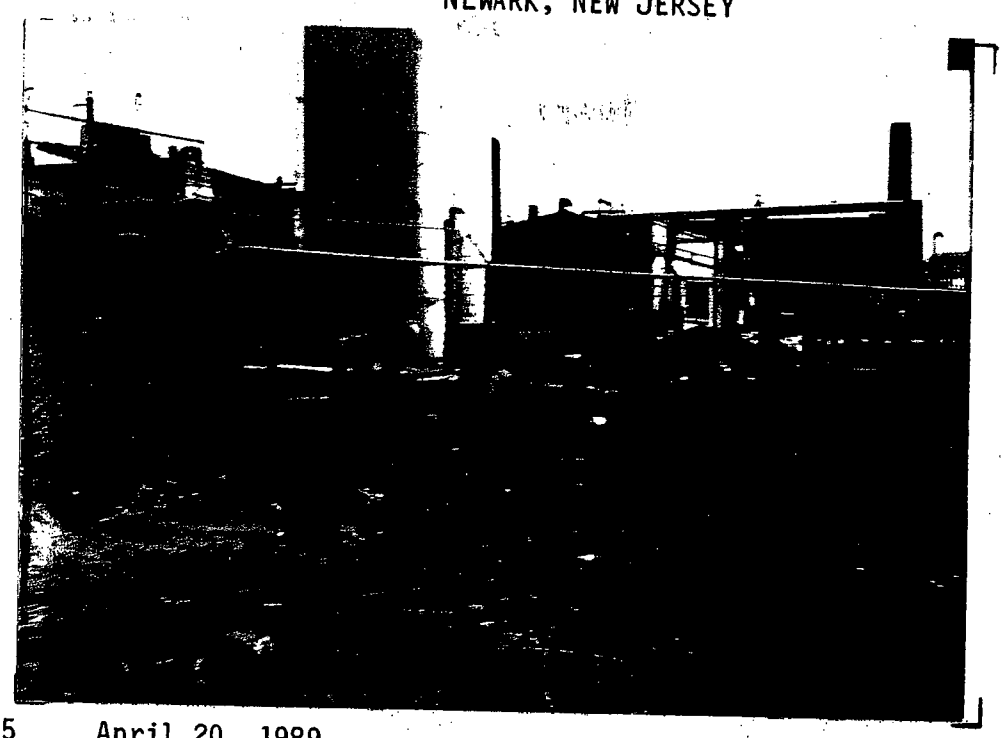
R3 P2 S2 April 20, 1989 1359
Looking west at side and back of office, process building and tanks.



R3 P3 S3 April 20, 1989 1402
Looking south along Cornelia Street at drum storage and stained sidewalk.

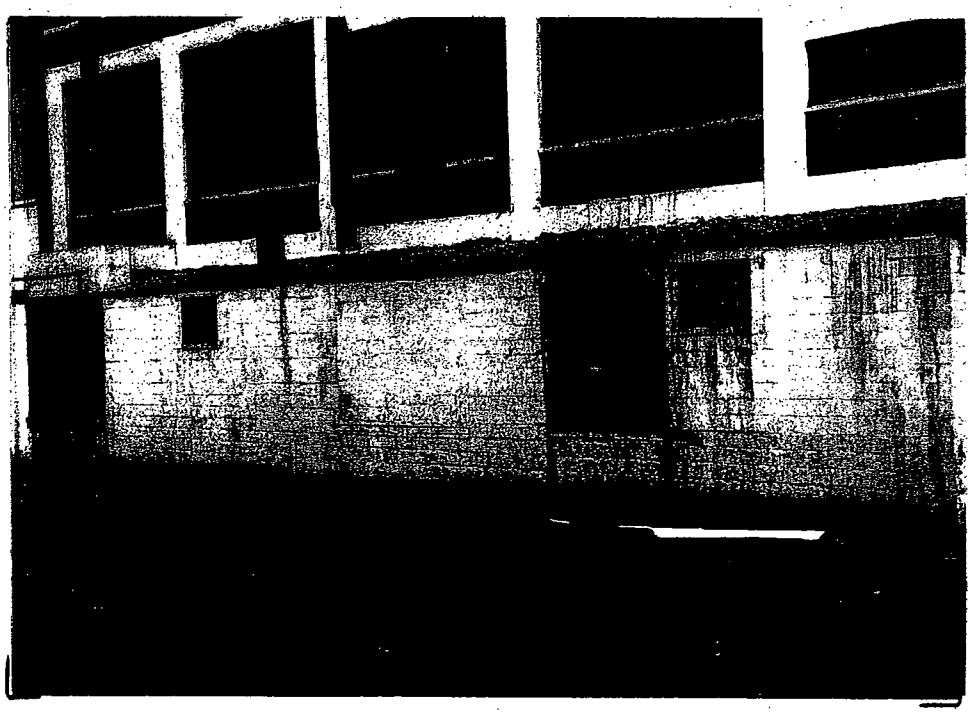


R3 P4 S4 April 20, 1989 1404
Looking north along Cornelia Street at drum storage and stained sidewalk.



R3 P5 S5 April 20, 1989 1407
Looking SE from Lister Ave. at drum storage and excavated soil.

R3 P6 S6 April 20, 1989 1410
Looking SE from Lister Ave. at drum storage, process tanks, and railroad tracks.



R3 P7 S7 April 20, 1989 1415
Looking at west side of office at indoor storage from Cornelia Street.

ATTACHMENT 2

REFERENCES

1. United States Environmental Protection Agency, Notification of Hazardous Waste Activity, August 20, 1980.

2. Unites States Environmental Protection Agency, General Information, General Form 1, August 20, 1980.

3. United States Environmental Protection Agency, Hazardous Waste Permit Application, November 17, 1989.

4. New Jersey Department of Environmental Protection, RCRA Generator Inspection Form, May 27, 1981.

5. New Jersey Department of Environmental Protection, RCRA Treatment, Storage, and Disposal Facility Inspection Form, May 27, 1981.

6. United States Environmental Protection Agency, Region II; Complaint, Compliance Order, and Notice of Opportunity for Hearing; Docket No. II RCRA-81-0114; Cellofilm Corporation, September 29, 1981.

7. United States Environmental Protection Agency, refilings of EPA Forms 8700-12 (6-80) and 3510-1(6-80), Cellofilm Corporation, Newark, New Jersey, July 7, 1982.

8. Letter from Frank Coolick, Chief, Bureau of Hazardous Waste Engineering, to Mr. Robert Rossomando, Vice President, Cellofilm Corporation, October 24, 1983.

9. Letter from Robert Rossomando, Vice President, Cellofilm Corporation, to Mr. Bruce Adler, Attorney General Enforcement Branch, Enforcement Division, U.S. Environmental Protection Agency, Region II, March 2, 1981.

10. Off-Site Reconnaissance Information Reporting Form, NUS Corp. Region 2 FIT, April 20, 1989, TDD No. 02-8904-27.

11. Herpers, H. and H.C. Barksdale. Preliminary Report on the Geology and Ground-Water Supply of the Newark, New Jersey Area. Special Report 10. State of New Jersey Department of Conservation and Economic Development, Division of Water Policy and Supply, 1951.

12. Telecon Note: Conversation between Drew Baris, U.S. Environmental Protection Agency Region 2, Office of Groundwater Management, and Edmund Knyfd Jr., NUS Corp., May 15, 1989.

13. The Hydrogeology of the Buried Valley Aquifer System, Passaic River Coalition, 246 Madisonville Road, Basking Ridge, New Jersey, 1983.

14. Miller, D. W. The New Jersey Ground-Water Situation. A Geraghty and Miller Special Report. Geraghty and Miller Inc., Groundwater Consultants, Hackensack, New Jersey, August 1979.

15. Uncontrolled hazardous waste site ranking system, A user's manual, 40 CFR, Part 300, Appendix A, 1986.

16. Telecon Note: Conversation between Mr. Melito, engineer, Essex County Department of Public Works, and Richard Pagano, NUS Corp., January 20, 1988.

REFERENCES (cont'd)

17. Telecon Note: Conversation between Ms. James, Newark City Water Department, and David Heim, NUS Corp., February 27, 1989.

18. Telecon Note: Conversation between Harold Carscadden, Plant Technician, Passaic Valley Sewerage Commission, and Edmund Knyfd Jr., NUS Corp., May 4, 1989.

19. Three-Mile Vicinity Map based on U.S. Department of the Interior, Geological Survey Topographic Maps, 7.5 minute series, "Elizabeth, NJ-NY", 1967, photorevised 1981; "Jersey City, NJ-NY", 1967, photorevised 1981; "Weehawken, NJ-NY", 1967, photorevised 1981; "Orange, NJ", 1955, photorevised 1981.

20. State of New Jersey Department of Environmental Protection, Division of Water Resources, Surface Water Quality Standards, N.J.A.C. 7:9-4, Index D-Surface Water Classifications of the Passaic, Hackensack and N.Y. Harbor Complex Basin, July 1985.

21. New Jersey Department of Environmental Protection, Division of Water Resources, Surface Water Quality Standards, N.J. A.C. 7:9-4.1 et. seq., May 1985.

22. U.S. Department of the Interior, U.S.Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12, April 10, 1987.

23. U.S. Department of the Interior, U.S. Fish and Wildlife Service, Atlantic Coast Ecological Inventory, Newark NJ-NY-PA, 1980.

24. State of New Jersey Department of Environmental Protection, Water Supply Overlay, Sheet 26, August 1975.

25. General Sciences Corporation, Graphical Exposure Modeling Systems (GEMS). Landover, Maryland, 1986.

26. United States Department of the Interior, Geological Survey, State of New Jersey Department of Conservation and Economic Development, Division of Water Policy and Supply, Special Report No. 28. Groundwater Resources of Essex County, New Jersey, 1968.

27. Atlas of National Wetlands Inventory Maps for New Jersey, United States Department of the Interior, Fish and Wildlife Service, Habitat Resources, Newton Corner, Massachusetts, 1984.

28. Telecon Note: Conversation between Mr. Al Ronaldson, Construction Officer, U.S. Navy, Brooklyn, NY, and Edmund Knyfd Jr., NUS Corp., May 16, 1989.

29. Telecon Note: Conversation between Mr. Ed Tideman, Engineer, Passaic Valley Sewerage Commission, and Edmund Knyfd Jr., NUS Corp., May 16, 1989.

30. Telecon Note: Conversation between Mr. Zafar, Engineer, City of Newark Sewer Division, and Edmund Knyfd Jr., NUS Corp., May 16, 1989.

31. Project Note: To Cellofilm Corporation file, TDD No. 02-8904-27, from Edmund Knyfd Jr., NUS Corp., subject: potential for public supply well contamination, May 16, 1989.

32. Bragin, A.B. Hackensack River Symposium II, Fishes of the lower Hackensack River, Fairleigh Dickinson University - Teaneck, NJ, September 13, 1988.

REFERENCE NO. 1

Please print or type with ELITE type *(12 characters/inch)* in the unshaded areas only.

Form Approved OMB No. 158-S79016
GSA No. 0246-EPA-OT

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTIFICATION OF HAZARDOUS WASTE ACTIVITY

INSTALLATION'S EPA I.D. NO.	PLEASE PLACE LABEL IN THIS SPACE
I. NAME OF INSTALLATION	
II. INSTALLATION MAILING ADDRESS	
III. LOCATION OF INSTALLATION	

INSTRUCTIONS: If you received a preprinted label, affix it in the space at left. If any of the information on the label is incorrect, draw a line through it and supply the correct information in the appropriate section below. If the label is complete and correct, leave Items I, II, and III below blank. If you did not receive a preprinted label, complete all items. "Installation" means a single site where hazardous waste is generated, treated, stored and/or disposed of, or a transporter's principal place of business. Please refer to the INSTRUCTIONS FOR FILING NOTIFICATION before completing this form. The information requested herein is required by law *(Section 3010 of the Resource Conservation and Recovery Act).*

DETACH

FOR OFFICIAL USE ONLY

COMMENTS: C

INSTALLATION'S EPA I.D. NUMBER: F NJD000813451 (T/A: 2, C: 1)

APPROVED:

DATE RECEIVED (yr., mo., & day): 800818

I. NAME OF INSTALLATION

Cellofilm Corporation

II. INSTALLATION MAILING ADDRESS

STREET OR P.O. BOX: 3 241 Union Ave

CITY OR TOWN: 4 WoodRidge — ST.: NJ — ZIP CODE: 07075

III. LOCATION OF INSTALLATION

STREET OR ROUTE NUMBER: 5 45-5 Cornelia St

CITY OR TOWN: 6 Newark — ST.: NJ — ZIP CODE: 07105

IV. INSTALLATION CONTACT

NAME AND TITLE *(last, first, & job title)*: 2 Rossomando Robert Vice Pres

PHONE NO. *(area code & no.)*: 201 438 7100

V. OWNERSHIP

DETACH

A. NAME OF INSTALLATION'S LEGAL OWNER: 8 Cellofilm Corp 241 Union Ave WoodRidgeNJ

B. TYPE OF OWNERSHIP *(enter the appropriate letter into box)*

F = FEDERAL
M = NON-FEDERAL

M

VI. TYPE OF HAZARDOUS WASTE ACTIVITY *(enter "X" in the appropriate box(es))*

- [X] A. GENERATION
- [X] B. TRANSPORTATION *(complete item VII)*
- [X] C. TREAT/STORE/DISPOSE
- [ ] D. UNDERGROUND INJECTION

VII. MODE OF TRANSPORTATION *(transporters only – enter "X" in the appropriate box(es))*

- [ ] A. AIR
- [ ] B. RAIL
- [X] C. HIGHWAY
- [ ] D. WATER
- [ ] E. OTHER *(specify)*:

VIII. FIRST OR SUBSEQUENT NOTIFICATION

Mark "X" in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your Installation's EPA I.D. Number in the space provided below.

- [X] A. FIRST NOTIFICATION
- [ ] B. SUBSEQUENT NOTIFICATION *(complete item C)*

C. INSTALLATION'S EPA I.D. NO.

IX. DESCRIPTION OF HAZARDOUS WASTES

Please go to the reverse of this form and provide the requested information.

EPA Form 8700-12 (6-80)

(29)

CONTINUE ON REVERSE

I.D. – FOR OFFICIAL USE ONLY

S															Y/A	C
W	N	S	D	0	0	0	8	1	3	4	5	1			2	1
1	2												13	14		15

IX. DESCRIPTION OF HAZARDOUS WASTES *(continued from front)*

A. HAZARDOUS WASTES FROM NON–SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.31 for each listed hazardous waste from non–specific sources your installation handles. Use additional sheets if necessary.

1	2	3	4	5	6
F003	F005				
7	**8**	**9**	**10**	**11**	**12**

B. HAZARDOUS WASTES FROM SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.32 for each listed hazardous waste from specific industrial sources your installation handles. Use additional sheets if necessary.

13	14	15	16	17	18
K079					
19	**20**	**21**	**22**	**23**	**24**
25	**26**	**27**	**28**	**29**	**30**

C. COMMERCIAL CHEMICAL PRODUCT HAZARDOUS WASTES. Enter the four–digit number from 40 CFR Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

31	32	33	34	35	36
U002	U031	U112	U140	U154	U159
37	**38**	**39**	**40**	**41**	**42**
U161	U220	U239			
43	**44**	**45**	**46**	**47**	**48**

D. LISTED INFECTIOUS WASTES. Enter the four–digit number from 40 CFR Part 261.34 for each listed hazardous waste from hospitals, veterinary hospitals, medical and research laboratories your installation handles. Use additional sheets if necessary.

49	50	51	52	53	54

E. CHARACTERISTICS OF NON–LISTED HAZARDOUS WASTES. Mark "X" in the boxes corresponding to the characteristics of non–listed hazardous wastes your installation handles. *(See 40 CFR Parts 261.21 – 261.24.)*

- [X] 1. IGNITABLE (D001)
- [X] 2. CORROSIVE (D002)
- [ ] 3. REACTIVE (D003)
- [ ] 4. TOXIC (D000)

X. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this 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 penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE	NAME & OFFICIAL TITLE *(type or print)*	DATE SIGNED
Robert Rossomando	Robert Rossomando Vice President	8/20/80

EPA Form 8700-12 (6-80) REVERSE

ap

REFERENCE NO. 2

(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F D0 0 0 8 1 3 4 5 1

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provid[illegible] it in the designated space. Review th[illegible] ation carefully; if any of it is incor[illegible] through it and enter the correct de[illegible] appropriate fill—in area below. Also, if any [illegible] the preprinted data is absent *(the area to t[illegible] left of the label space lists the informati[illegible] that should appear)*, please provide it in t[illegible] proper fill—in area(s) below. If the label [illegible] complete and correct, you need not comple[illegible] Items I, III, V, and VI *(except VI-B whi[illegible] must be completed regardless)*. Complete [illegible] items if no label has been provided. Refer [illegible] the instructions for detailed item descri[illegible] tions and for the legal authorizations und[illegible] which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

SPECIFIC QUESTIONS	MARK "X" YES	MARK "X" NO	MARK "X" FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X	
B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X	
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	
J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 Cellofilm Corporation

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title): Rossomando Robert Vice Pres.

B. PHONE (area code & no.): 201 438 7100

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX: 241 Union Avenue

B. CITY OR TOWN: Wood-Ridge

C. STATE: NJ

D. ZIP CODE: 07075

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER: 45-5 Cornelia Street

B. COUNTY NAME: Essex

C. CITY OR TOWN: Newark

D. STATE: NJ

E. ZIP CODE: 07105

F. COUNTY CODE (if known):

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
C 7 2869 (specify) Industrial Organic Chemicals	C 7 (specify)
C. THIRD	**D. FOURTH**
C 2851 (specify) Paints and Varnishes	C 7 (specify)

VIII. OPERATOR INFORMATION

A. NAME: C Cellofilm Corporation

B. Is the name listed in Item VIII-A also the owner? [X] YES [ ] NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)
P (specify)

D. PHONE (area code & no.): C A 201 589 3871

E. STREET OR P.O. BOX: 45-5 Cornelia Street

F. CITY OR TOWN: C B Newark

G. STATE: NJ

H. ZIP CODE: 07105

IX. INDIAN LAND

Is the facility located on Indian lands? [ ] YES [X] NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): C T I 9 N	**D. PSD** (Air Emissions from Proposed Sources): C T I 9 P
B. UIC (Underground Injection of Fluids): C T I 9 U	**E. OTHER** (specify): C T I 9 (specify)
C. RCRA (Hazardous Wastes): C T I 9 R	**E. OTHER** (specify): C T I 9 (specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements. F9: A/50

XII. NATURE OF BUSINESS (provide a brief description)

Transporter of Industrial Resins and Coatings

F9: A/51

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Robert Rossomando Vice President		

COMMENTS FOR OFFICIAL USE ONLY

C

REFERENCE NO. 3

FORM 3 RCRA

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

Form Approved OMB No. 158-S80004

I. EPA I.D. NUMBER

F C O O 8 1 5

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS
	8 0 1 1 1 9	

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

X 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

C	YR.	MO.	DAY
8	7 3	0 3	0 1

☐ 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

YR.	MO.	DAY

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

☐ 1. FACILITY HAS INTERIM STATUS

☐ 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code*(s)* in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U

UNIT OF MEASURE	UNIT OF MEASURE CODE
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H

UNIT OF MEASURE	UNIT OF MEASURE CODE
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C D U P 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G	
X-2	T 0 3	20	E	
1	S 0 1	7,000 000	G	
2	S 0 2	12,500 000	G	
3				
4				
5				
6				
7				
8				
9				
10				

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CONTINUE ON REVERSE

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES *(code "T04")*. FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

A. **EPA HAZARDOUS WASTE NUMBER** – Enter the four–digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four–digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. **ESTIMATED ANNUAL QUANTITY** – For each **listed waste** entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each **characteristic** or **toxic contaminant** entered in column A estimate the total annual quantity of all the non–listed waste*(s)* that will be handled which possess that characteristic or contaminant.

C. **UNIT OF MEASURE** – For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. **PROCESSES**

1. PROCESS CODES:
   For listed hazardous waste: For each **listed** hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non–listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate **all** the processes that will be used to store, treat, and/or dispose of all the non–listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER – Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* – A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non–listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

CONTINUE ON PAGE 3

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

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EPA I.D. NUMBER (enter from page 1): W [illegible] T/A 3 C 1

FOR OFFICIAL USE ONLY: W DUP T/A 3 C 2 DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	U002	6000000	P	S01	D80			
2	U031	6000000	P	S01	D80			
3	U112	6000000	P	S01	D80			
4	U140	6000000	P	S01	D80			
5	U154	6000000	P	S01	D80			
6	U159	6000000	P	S01	D80			
7	U161	6000000	P	S01	D80			
8	U220	6000000	P	S01	D80			
9	U239	6000000	D	S01	D80			
10								Included with above
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

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CONTINUE ON REVERSE

(enter "A", "B", "C", etc. behind the "3" to identify photocopied pages)

V. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

F6 : A/55 F6 : A/56

EPA I.D. NO. *(enter from page 1)* T/A 3 C 6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground–level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail).*

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
40 44 116	074 08 152

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
	C G		

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this 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 penalties for submitting false information, including the possibility of fine and imprisonment.

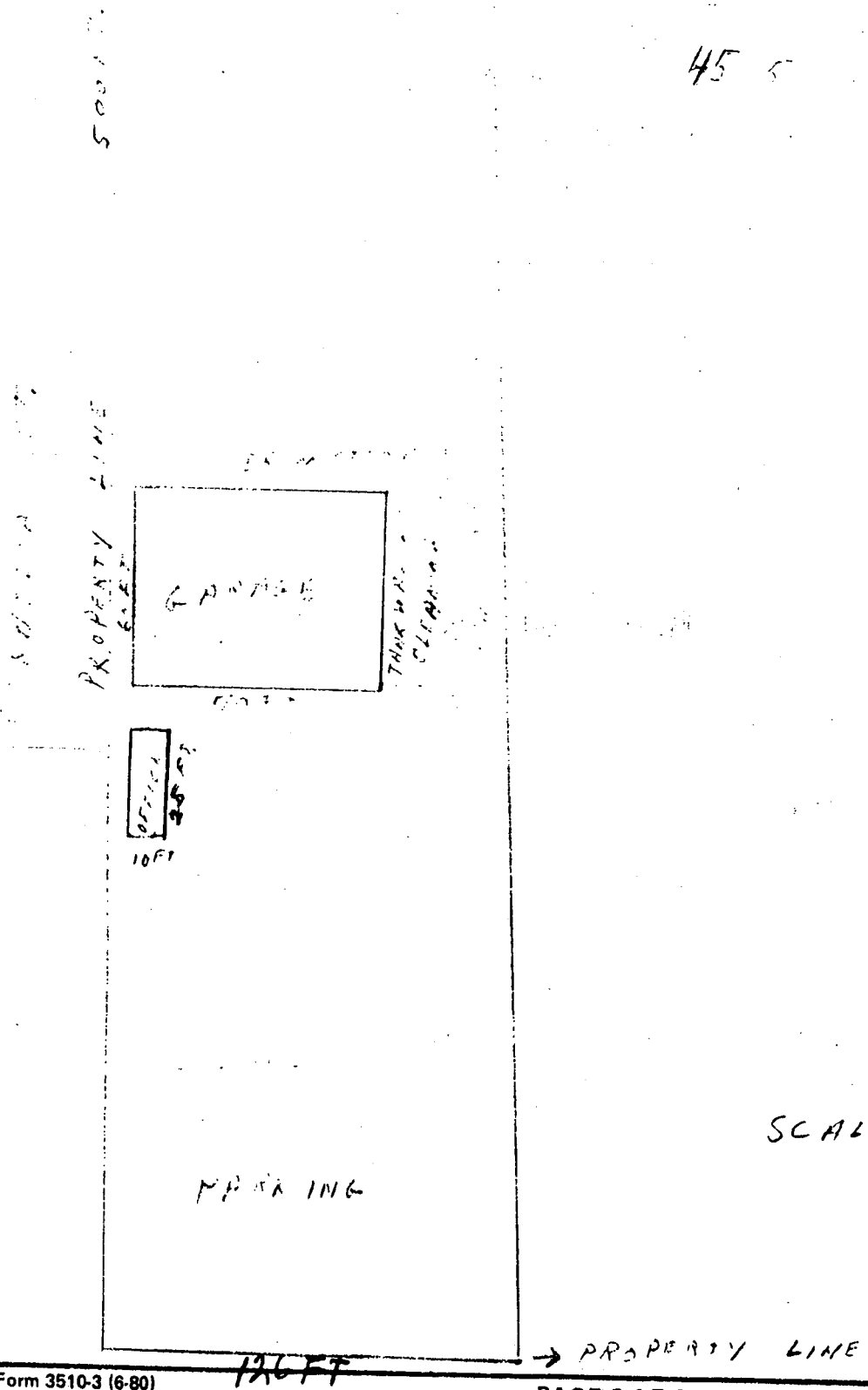
A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Robert Rossomando Vice President		

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this 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 penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED

Form Approved OMB No. 158-S80004



SCALE: 1MM = 2FT.

REFERENCE NO. 4

RCRA GENERATOR INSPECTION FORM

COMPANY NAME: Cello Film Corp.

EPA I.D. NUMBER: NJD000813451

COMPANY ADDRESS: 45-5 Cornelia st. Newark, N.J.

COMPANY CONTACT OR OFFICIAL: 1) Mr. Watychawiz, 2) Mr. Eftaxes

INSPECTOR'S NAME: Alphonse Iannuzzi

TITLE: 1) Plant superintendent, 2) Transportation manager

BRANCH/ORGANIZATION: NJ DEP

CHECK IF FACILITY IS ALSO A TSD FACILITY [X]

DATE OF INSPECTION: 5-27-81

	YES	NO	DON'T KNOW
(1) Is there reason to believe that the facility has hazardous waste on site?	X		

a. If yes, what leads you to believe it is hazardous waste? Check appropriate box:

[X] Company admits that its waste is hazardous during the inspection.

[ ] Company admitted the waste is hazardous in its RCRA notification and/or Part A Permit Application.

[ ] The waste material is listed in the regulations as a hazardous waste from a nonspecific source (§261.31)

[ ] The waste material is listed in the regulations as a hazardous waste from a specific source (§261.32)

[ ] The material or product is listed in the regulations as a discarded commercial chemical product (§261.33)

[ ] EPA testing has shown characteristics of ignitability, corrosivity, reactivity or extraction procedure toxicity, or has revealed hazardous constituents (please attach analysis report)

[ ] Company is unsure but there is reason to believe that waste materials are hazardous. (Explain)

Waste material is cellomers finished goods that are cleaned out of cello Films tank wagoons and drumed. All materials are alkyd resins mixed together consisting of flammable and non-flammable material.

	YES	NO	DON'T KNOW
b. Is there reason to believe that there are hazardous wastes on-site which the company claims are merely products or raw materials?	X		

Please explain:
approximatly 25 one gallon containers of flammable material some rusted through container and 16 drums (55 gal.) rusted containing wax material. Facility states that material will be rewed.

c. Identify the hazardous wastes that are on-site, and estimate approximate quantities of each.

6 partially full drums (55 gallon) of mixed Alkyd resins consisting of flammable and combustible material.

d. Describe the activities that result in the generation of hazardous waste.

cleaning and draining of tank wagons.

(2) Is hazardous waste stored on site?	X		
a. What is the longest period that it has been accumulated? more than 1 year.			
b. Is the date when drums were placed in storage marked on each drum?		X	
(3) Has hazardous waste been shipped from this facility since November 19, 1980?		X	
a. If "yes," approximately how many shipments were made?			
(4) Approximately how many hazardous waste shipments off site have been made since November 19, 1980? none			
a. Does it appear from the available information that there is a manifest copy available for each hazardous waste shipment that has been made?			X

Facility claims that hazardous waste never was sent of site, therefore, facility has no manifest records.

b. If "no" or "don't know," please elaborate.

	YES	NO	DON'T KNOW
c. Does each manifest (or a representative sample) have the following information? N/A			
- a manifest document number no manifests because waste was not transported to site			
- the generator's name, mailing address, telephone number, and EPA identification number	___	___	___
- the name, and EPA identification number of each transporter	___	___	___
- the name, address and EPA identification number of the designated facility and an alternate facility, if any:	___	___	___
- a description of the wastes (DOT)	___	___	___
- the total quantity of each hazardous waste by units of weight or volume, and the type and number of containers as loaded into or onto the transport vehicle	___	___	___
- a certification that the materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation under regulations of the Department of Transportation and the EPA	___	___	___
(5) Were there any hazardous wastes stored on site at the time of the inspection?	X	___	___
a. If "yes," do they appear properly packaged (if in containers) or, if in tanks, are the tanks secure?	___	X	___
b. If not properly packaged or in secure tanks, please explain. containers rusted and leaking			
c. Are containers clearly marked and labelled?	___	X	___
d. Do any containers appear to be leaking?	X	___	___
e. If "yes," approximately how many? 1 container was punctured and leaking and 2 containers were over filled with resins.			

*(6) Has the generator submitted an annual report to EPA covering the previous calendar year? N/A

a. How do you know?

(7) Has the generator received signed copies (from the TSD facility) of all manifests for wastes shipped off site more than 35 days ago? N/A

a. If "no," have Exception Reports been submitted to EPA covering these shipments?

(8) General comments.

Cello Film Corp. is a trucking outfit for Poly Chrome, Yonkers, NY which is a parent company of Cello Film Woodridge, NJ and Cellomer Albert ave. Newark, NJ. Cello Film transports finished products for Poly chrome, nitrocellulose for Cellofilm-woodridge-, and alkyd resins for Cellomer. Cello film does not haul hazardous waste.

Tank wagoons containing resins are rinced out and material is drummed and stored in trailer lot. Tank wagoons are also washed out with caustic solution (7.5% NaOH), rinced with water which is neutralized and discharged to the sewer (Passaic Valley Sewage Authority). Caustic wash solution is also neutralized and discharged to sewer when it is spent. The 3 tanks used in the tank wash system were all in good condition. This wash system was implemented approximatly 1 year ago.

* The effective date for this requirement is March 1, 1982.

Observations and/or Other Comments

A drum(55gal) of waste oil from Cello Film vehicles (crank case oil) was noted on site. Cello Film gives this material to a garbage truck to use as hydrolic fluid in the truck. Mr. EFtaxes stated that the company was Shubert of Newark but was not sure of the exact company name. Cello Film was informed that their waste oil must be removed by a registered special waste hauler to a registered facility.

Inspection of lot revealed that some spilled resins (approx. 10'x 5') and waste oil sludges on soil and gravel were noted. A rusted bottom section of a drum containing hardened resin type material was also noted. Eight (8) drums of flammable and non-flammable alkyd resins were noted. One drum was leaking because it was punctured and 2 other drums were over filled and leaked resins onto the soil.

Sixteen drums on a flat bed truck were noted in the lot. Some drums were leaking and were in poor condition (i.e. rusted). Mr. EFtaxes stated that this material was wax that will be brought to the Cello Film corp. in Woodridge, NJ. for use. Spilled material did appear to be wax.

A box trailer on site contained approximatly 25 one gallon cans of flammable blanket wash product. Some cans were rusted through. Mr. EFtaxes stated that this trailer was only on site for 2 months and these containers came from a division of Polychrome. The

Inspector's Signature

Alphonse Lamuggio

Facility Operator's Signature

Observations and/or Other Comments

exact facility was not known by Mr. EF taxes. This material will either be reused or packed into drums as hazardous waste.

Cello Film stated that they will achieve the following in order to comply with existing state and Federal regulations:

1). repack all leaking drums and those in poor condition within 1 week of inspection,

2). cleanup and drum all spilled sludges and resins within 1 week of inspection,

3). Label and date all waste materials in containers, and.

4) Send a letter to NJ DEP indicating disposal or reuse of 1 gallon cans within 1 week of inspection.

Mr. Watychawiz was informed that Cello Film cannot store waste from Newark facility at Woodridge facility unless Woodridge is registered as a transfer station with the NJ. DEP. Mr. Watychawiz indicated that this will not be done and S&W Waste Inc. so, Kearny, NJ will be contacted to remove waste drums presently on site that have been stored for more than 6 months.

Inspector's Signature

Alphonse Iannuzzi Jr.

Facility Operator's Signature

REFERENCE NO. 5

RCRA TREATMENT, STORAGE AND DISPOSAL FACILITY INSPECTION FORM
FOR TSD FACILITIES ONLY

COMPANY NAME: [illegible] EPA I.D. Number: [illegible]

COMPANY ADDRESS: [illegible]

COMPANY CONTACT OR OFFICIAL: Mr. Watychowiz

TITLE: Plant Superintendent

OTHER ENVIRONMENTAL PERMITS HELD BY FACILITY: ☐ NPDES none ☐ AIR ☐ OTHER

INSPECTOR'S NAME: Alphonse Iannazzo DATE OF INSPECTION: 5-27-91

BRANCH/ORGANIZATION: NJ DEP TIME OF DAY INSPECTION TOOK PLACE: 1307

(1) Is there reason to believe that the facility has hazardous waste on site?

a. If yes, what leads you to believe it is hazardous waste? Check appropriate box:

☒ Company admits that its waste is hazardous during the inspection.

☐ Company admitted the waste is hazardous in its RCRA notification and/or Part A Permit Application.

☐ The waste material is listed in the regulations as a hazardous waste from a nonspecific source (§261.31)

☐ The waste material is listed in the regulations as a hazardous waste from a specific source (§261.32)

☐ The material or product is listed in the regulations as a discarded commercial chemical product (§261.33)

☐ EPA testing has shown characteristics of ignitability, corrosivity, reactivity or extraction procedure toxicity, or has revealed hazardous constituents (please attach analysis report)

☐ Company is unsure but there is reason to believe that waste materials are hazardous. (Explain)

	YES	NO	DON'T KNOW
b. Is there reason to believe that there are hazardous wastes on-site which the company claims are merely products or raw materials?		X	

Please explain:

c. Identify the hazardous wastes that are on-site, and estimate approximate quantities of each. eight (8) full 55 gal drums of combined flammable and combustible alkyd resins.

(2) Does the facility generate hazardous waste?	X		
(3) Does the facility transport hazardous waste?		X	
(4) Does the facility treat, store or dispose of hazardous waste?	X		

VISUAL OBSERVATIONS

(5) SITE SECURITY (§265.14)

	YES	NO	DON'T KNOW
a. Is there a 24-hour surveillance system? Operate 24 hr. during week and have guards during weekends		X	
b. Is there a suitable barrier which completely surrounds the active portion of the facility?	X		
c. Are there "Danger-Unauthorized Personnel Keep Out" signs posted at each entrance to the facility?		X	

(6) Are there ignitable, reactive or incompatible wastes on site? (§265.27) X

a. If "YES", what are the approximate quantities? eight (8) drums

b. If "YES", have precautions been taken to prevent accidential ignition or reaction of ignitable or reactive waste? X

c. If "YES", explain

d. In your opinion, are proper precautions taken so that these wastes do not:

- generate extreme heat or pressure, fire or explosion, or violent reaction?		X	
- produce uncontrolled toxic mists, fumes, dusts, or gases in sufficent quantities to threaten human health?	X		
- produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions?		X	no fire extinguishers present
- damage the structural integrity of the device or facility containing the waste?	X		
- threaten human health or the environment? Spilled material threaten environment.		X	

Please explain your answers, and comment if necessary.

e. Are there any additional precautions which you would recommend to improve hazardous waste handling procedures at the facility? Storage of waste in more sound containers on pallets.

(7) Does the facility comply with preparedness and prevention requirements including maintaining: (§265.32)

	YES	NO	DON'T KNOW
- an internal communications or alarm system? intercom system	X		
- a telephone or other device to summon emergency assistance from local authorities?	X		
- portable fire equipment? inside building but not in waste area	X		
- adequate aisle space?	X		
- in your opinion, do the types of wastes on site require all of the above procedures, or are some not needed? Explain.	X		

Adequate aisle space is not needed due to small quantity of drums handled.

In your opinion, do the types of wastes on site require all of the above procedures, or are some not needed? Explain.

See above comment, all other procedures are needed.

*(8) Have you inspected to verify that the groundwater monitoring wells (if any) mentioned in the facility's groundwater monitoring plan (see no. 19 below) are properly installed? no wells on site		X	
If you have, please comment, as appropriate.			
(9) a. Is there any reason to believe that groundwater contamination already exists from this facility? If "YES", explain. Posibility of groundwater contamination due to spillage depending on amount of spillage in past.			X
b. Do you believe that operation of this facility may affect groundwater quality?	X		
c. If "YES", explain. If proper precautions are not taken to contain spillage groundwater quality could be effected.			

RECORDS INSPECTION

(10) Has the facility received hazardous waste from an off-site source since Nov. 19, 1980 (effective date of the regulations)? Haz waste never received from an off site source.		X	
a. If "YES", does it appear that the facility has a copy of a manifest for each hazardous waste load received?			
b. How many post-November 19 manifests does it have? (If the number is large, you may estimate) None			
c. Does each manifest (or a representative sample) have the following information? N/A			
- a manifest document number			

* This requirement applies only after November 19, 1981.

	YES	NO	KNOW
- the generator's name, mailing address, telephone number, and EPA identification number			
- the name, and EPA identification number of each transporter			
- the name, address and EPA identification number of the designated facility and an alternate facility, if any;			
- a DOT description of the wastes			
- the total quantity of each hazardous waste by units of weight or volume, and the type and number of containers as loaded into or onto the transport vehicle			
- a certification that the materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation under regulations of the Department of Transportation and the EPA			
d. Are there any indications that unmanifested hazardous wastes have been received since November 19, 1980? If YES, explain.			

N/A

(11) Does the facility have a written waste analysis plan specifying test methods, sampling methods and sampling frequency? (§265.13)		X	
a. Does the character of wastes handled at the facility change from day to day, week to week, etc., thus requiring frequent testing? (You may check more than one) Waste characteristics vary ____ All wastes are basically the same ____ Company treats all waste as hazardous ____ Don't Know ____			
b. Does hazardous waste come to this facility from off-site sources?		X	
c. If waste comes from an off-site source, are there procedures in the plan to insure that wastes received conform to the accompanying manifest? N/A			
(12) INSPECTIONS (§265.15)			
a. Does the facility have a written inspection schedule?		X	
b. Does the schedule identify the types of problems to be looked for and the frequency for inspections?		X	
c. Does the owner/operator record inspections in a log?		X	
d. Is there evidence that problems reported in the inspection log have not been remedied? If "YES," please explain. N/A			

(13) PERSONNEL TRAINING (§265.16)

a. Is there written documentation of the following:

- job title for each position at the facility related to hazardous waste management and the name of the employee filling each job? ___ X ___
- type and amount of training to be given to personnel in jobs related to hazardous waste management? ___ X ___ Do have safety meetings occasionally
- actual training or experience received by personnel? ___ X ___

(14) Does the facility have a written contingency plan for emergency procedures designed to deal with fires, explosion or any unplanned release of hazardous waste? (§265.51) ___ X ___

a. Does the plan describe arrangements made with local authorities? ___ ___ ___

b. Has the contingency plan been submitted to local authorities? ___ ___ ___

How do you know?

c. Does the plan list names, addresses, and phone numbers of Emergency Coordinators? ___ ___ ___

d. Does the plan have a list of what emergency equipment is available? ___ ___ ___

e. Is there a provision for evacuating facility personnel? ___ ___ ___

f. Was an Emergency Coordinator present or on call at the time of the inspection? ___ ___ ___

N/A no contingency plan

(15) Does the owner/operator keep a written operating record with: (§265.73)

- a description of wastes received with methods and dates of treatment, storage or disposal? N/A no wastes received ___ ___ ___
- location and quantity of each waste? ___ X ___
- detailed records and results of waste analysis and treatability tests performed on wastes coming into the facility? ___ X ___
- detailed operating summary reports and description of all emergency incidents that required the implementation of the facility contingency plan? ___ X ___

*(16) Does the facility have written closure and post-closure plans? (§265.110) ___ X ___

a. Does the written closure plan include: N/A

- a description of how and when the facility will be partially (if applicable) and ultimately closed? ___ ___ ___

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* Effective date for this requirement is May 19, 1981.

- an estimate of the maximum inventory of wastes in storage or treatment at any time during the life of the facility? ___ ___ ___

- a description of the steps necessary to decontaminate facility equipment during closure? ___ ___ ___

- a schedule for final closure including the anticipated date when wastes will no longer be received and when final closure will be completed? ___ ___ ___

b. What is the anticipated date for final closure? ___ ___ ___

†c. Does the owner/operator have a written post-closure plan identifying the activities which will be carried on after closure and the frequency of these activities? ___ ___ ___

d. Does the written post-closure plan include:

- a description of planned groundwater monitoring activities and their frequencies during post-closure? ___ ___ ___

- a description of planned maintenance activities and frequencies to ensure integrity of final cover during post-closure? ___ ___ ___

- the name, address and phone number of a person or office to contact during post-closure? ___ ___ ___

*(17) Does the owner/operator have a written estimate of the cost of closing the facility? (§265.142) What is it? ___ ___ ___

*(18) Does the owner/operator have a written estimate of the cost for post-closure monitoring and maintenance? What is it? (§265.144) ___ ___ ___

*(19) Has a groundwater monitoring plan been submitted to the Regional Administrator for facilities containing a surface impoundment, landfill or land treatment process? (This requirement does not apply to recycling facilities.) (§265.90) ___ ___ ___ no ground water monitoring plan

a. Does the plan indicate that at least one monitoring well has been installed hydraulically upgradient from the limit of the waste mangement area? ___ ___ ___

b. Does the plan indicate that there are at least three monitoring wells installed hydraulically downgradient at the limit of the waste management area? ___ ___ ___

N/A no closure plan

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† This section applies only to disposal facilities.

* Effective date for this requirement is May 19, 1981.

SITE-SPECIFIC

Please circle all appropriate activities and answer questions on indicated pages for all activities circled. When you submit your report, include only those site-specific pages that you have used.

STORAGE	TREATMENT	DISPOSAL
Waste Pile p. 9	Tank p. 8	Landfill pp. 10-11
Surface Impoundment p. 8	Surface Impoundment pp. 8-9	Land Treatment pp. 9, 10
Container p. 7	Incineration pp. 12-13	Surface Impoundment p. 8
Tank, above ground p. 8	Thermal Treatment pp. 12-13	Other _____
Tank, below ground p. 8	Land Treatment pp. 9-10	
Other _____	Chemical, Physical p. 13 and Biological Treatment (other than in tanks, surface impoundment or land treatment facilities)	
	Other _____	

CONTAINERS (§265.170)

	YES	NO	DON'T KNOW	
1. Are there any leaking containers? If "YES", explain. A punctured container was leaking and 2 over filled drums leaked material onto soil.	X			
2. Are there any containers which appear in danger of leaking? If "YES", explain. rusted drums may leak if they are not repacked.	X			
3. Do wastes appear compatible with container materials?	X			
4. Are all containers closed except those in use?	X			
5. Do containers appear to be opened, handled or stored in a manner which may rupture the containers or cause them to leak?	X			containers over filled.
6. How often does the plant manager claim to inspect container storage areas? daily				
7. Does it appear that incompatible wastes are being stored in close proximity to one another? If "YES", explain.		X		
8. Are containers holding ignitable or reactive wastes located at least 15 meters (50 feet) from the facility's property line?		X		will relocate drums within 1 week.

9. What is the approximate number and size of containers with hazardous wastes?
8 drums of 55 gallon capacity,

REFERENCE NO. 6

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

In the Matter of CELLOFILM CORPORATION NJD000813451 Respondent. Proceeding Under Section 3008 of the Solid Waste Disposal Act, as amended.	COMPLAINT, COMPLIANCE ORDER, AND NOTICE OF OPPORTUNITY FOR HEARING Docket No. II RCRA-81-0114

COMPLAINT

This administrative proceeding is instituted pursuant to Section 3008 of the Solid Waste Disposal Act, as amended, 42 U.S.C. §6901 et seq. ("the Act"). [Note: Among the statutes amending the Act is the Resource Conservation and Recovery Act, 90 Stat. 2795, P.L. 94-580 (1976).]

The Director of the Enforcement Division of the U.S. Environmental Protection Agency ("EPA"), Region II, Complainant in this proceeding, has determined that Respondent, Cellofilm Corporation has violated Section 3004 of the Act, 42 U.S.C. §6924 and the regulations promulgated thereunder, as hereinafter specified:

1. Respondent owns and operates a facility located at 45-5 Cornelia Street, Newark, New Jersey 07105 ("the facility").

2. By notification dated August 18, 1980, Respondent informed EPA that it conducts activities at the facility involving "hazardous waste," as that term is defined in Section 1004(5) of the Act, 42 U.S.C. §6904(5) and in 40 CFR §261.3. By application dated November 17, 1980, Respondent requested a permit to conduct its hazardous waste activities.

3. On or about May 27, 1981, an inspection of the facility was conducted by duly-designated employees of EPA pursuant to Section 3007 of the Act, 42 U.S.C. §6927. Said inspection was conducted for the purpose of enforcing the EPA regulations for hazardous waste management, 40 CFR Parts 260 through 265 (published in 45 Fed. Reg. 33063 et seq., May 19, 1980 and as amended), promulgated pursuant to Subtitle C of the Act, 42 U.S.C. §6921 et seq.

4. The above-referenced inspection revealed that Respondent's facility was being used for the generation and storage of hazardous waste. The wastes on-site included alkyd resins, flammable blanket wash product and waste oil sludges.

5. 40 CFR Part 265 sets standards for all hazardous waste treatment, storage and disposal facilities.

6. 40 CFR §265.171 provides that if a container holding hazardous waste is not in good condition, or if it begins to leak, the owner or operator of the hazardous waste facility must transfer the hazardous waste from this container to a container that is in good condition, or manage the waste in some other way that complies with the requirements of 40 CFR Part 265. At the time of the May 27 inspection, a number of containers were rusted and some were leaking hazardous wastes onto the ground. These leaking wastes included alkyd resins and flammable blanket wash material. Respondent failed to transfer the wastes in these drums to other drums which were in good condition, and failed to manage these drums in any other appropriate manner. Respondent is therefore in violation of 40 CFR §265.171.

7. 40 CFR §265.173(b) requires that containers holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak. At the time of the May 27 inspection, at least two containers were observed to be overfilled with waste resins which were leaking onto the soil. Respondent is therefore in violation of 40 CFR §265.173(b).

PROPOSED CIVIL PENALTY

In view of the above-cited violations, and pursuant to the authority of Section 3008 of the Act, Complainant herewith proposes the assessment of a civil penalty in the amount of fourteen thousand dollars ($14,000.00) against Cellofilm Corporation for the violations specified hereinabove as follows:

For the violation of 40 CFR §265.171	-	$ 7,000
For the violation of 40 CFR §265.173(b)	-	$ 7,000
TOTAL PENALTY	-	$14,000

COMPLIANCE ORDER

Based upon the foregoing, and pursuant to the authority of Section 3008 of the Act, Complainant herewith issues the following Compliance Order against Respondent herein:

1. Respondent shall, by no later than sixty (60) days after the date of this Compliance Order, transfer all hazardous wastes presently stored in containers which are in poor condition to containers which are in good condition; or otherwise dispose of such wastes in accordance with the Act and the regulations promulgated thereunder.

2. Respondent shall, by no later than sixty (60) days after the date of this Compliance Order, insure that containers which house hazardous waste are not filled to a level which would cause them to leak or overflow onto the soil.

3. Respondent shall, within sixty (60) days of the effective date of this Order, identify and remove any soil which has been contaminated by the release of hazardous waste at the facility.

NOTICE OF LIABILITY FOR ADDITIONAL CIVIL PENALTIES

Pursuant to the terms of Section 3008(a)(3) of the Act, a violator failing to take corrective action within the time specified in a Final Compliance Order is liable for a civil penalty of up to $25,000 for each day of continued noncompliance. Such continued noncompliance may also result in suspension or revocation of any permits issued to the violator pursuant to the authority of the Act.

NOTICE OF OPPORTUNITY TO REQUEST A HEARING

As provided in Section 3008(b) of the Act, and in accordance with EPA's Consolidated Rules of Practices Governing the Administrative Assessment of Civil Penalties and the Revocation or Suspension of Permits, 40 CFR Part 22, 45 Fed. Reg. 24360 (April 9, 1980) (a copy of which accompanies this Complaint, Compliance Order, and Notice of Opportunity for Hearing), you have the right to request a hearing to contest any material fact set out in the Complaint, or to contest the appropriateness of the proposed penalty, or the terms of the Compliance Order. (Consistent with the provisions of Section 3008(b) of the Act, the hearing provided will be noticed and open to the general public, should you specifically request such a public hearing. In the absence of such a specific request, however, public notice of a scheduled hearing will not be published.)

To avoid being found in default, and having the proposed civil penalty assessed and the Compliance Order confirmed without further proceedings, you must file a written answer to the Complaint, which may include a request for

a hearing. Your answer (if any) must be addressed to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region II, 26 Federal Plaza, New York, New York, 10278, and must be filed within thirty (30) days of your receipt of this Complaint, Compliance Order, and Notice of Opportunity for Hearing. Your answer must clearly and directly admit, deny or explain each of the factual allegations contained in the Complaint, and should contain (1) a clear statement of the facts which constitute the grounds of your defense, and (2) a concise statement of the contentions which you intend to place in issue at the hearing.

The denial of any material fact, or the raising of any affirmative defense, will be construed as a request for a hearing. Failure to deny any of the factual allegations in the Complaint will be deemed to constitute an admission of the undenied allegations. Your failure to file a written answer within thirty (30) days of receipt of this instrument will be deemed to represent your admission of all facts alleged in the Complaint, and a waiver of your right to a formal hearing to contest any of the facts alleged by the Complainant. Your default will result in the final issuance of the Compliance Order, and assessment of the proposed civil penalty, without further proceedings.

INFORMAL SETTLEMENT CONFERENCE

Whether or not you request a hearing, the EPA encourages settlement of this proceeding consistent with the provisions of the Act. At an informal conference with a representative of the Complainant you may comment on the charges and provide whatever additional information you feel is relevant to the disposition of this matter, including any actions you have taken to correct the violation, and any other special circumstances you care to raise. The Complainant has the authority to modify the amount of the proposed penalty, where appropriate, to reflect any settlement agreement reached with you in such conference, or to recommend that any or all of the charges be dismissed, if the circumstances so warrant. Your request for an informal conference and other questions that you may have regarding this Complaint, Compliance Order, and Notice of Opportunity for Hearing should be directed to Jodi Lee Alper, Attorney, General Enforcement Branch, U.S. Environmental Protection Agency, Region II, 26 Federal Plaza, New York, New York, 10278, telephone (212) 264-1196.

Please note that a request for an informal settlement conference does not extend the thirty (30) day period during which a written answer and request for a hearing must be submitted. The informal conference procedure may be pursued as an alternative to or simultaneously with the adjudicatory hearing procedure. However, no penalty reduction will be made simply because such a conference is held. Any settlement which may be reached as a result of such conference will be embodied in a written Consent Agreement and Final Compliance Order to be issued by the Regional Administrator of EPA, Region II, and signed by you or

your representative. Your signing of such Consent Agreement would constitute a waiver of your right to request a hearing on any matter stipulated to therei

RESOLUTION OF THIS PROCEEDING WITHOUT HEARING OR CONFERENCE

Instead of filing an answer requesting a hearing or requesting an informal settlement conference, you may choose to comply with the terms of the Compliance Order, and to pay the proposed penalty. In that case, payment should be made by sending to the Regional Hearing Clerk, EPA, Region II, a cashier's or certified check in the amount of the penalty specified in the "Proposed Civil Penalty" section of this instrument. Your check must be made payable to the United States of America.

DATED: New York, New York

September 29, 1981

COMPLAINANT:

Michael P. Gruchowsky FOR:

Julio Morales-Sanchez
Director
Enforcement Division
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, New York 10278

TO: Mr. Raymond Watychowicz
Plant Superintendent
Cellofilm Corporation
241 Union Avenue
Wood-Ridge, New Jersey 07075

cc: George Tyler, Esq.
Assistant Commissioner for
Environmental Management
New Jersey Department of Environmental
Protection

bcc: Douglas Farnsworth (WH-537-M)
Gail Karlsson, (WH-537-M)
Tom Taccone, 2PM-PA
Margaret Randol, 2EP-PA

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CERTIFICATE OF SERVICE

This is to certify that on the 2nd day of October, 1981 I served a true and correct copy of the foregoing Complaint by certified mail to Mr. Raymond Watychowicz, Plant Superintendent, Cellofilm Corporation, 241 Union Avenue, Wood-Ridge, New Jersey, 07075. I handcarried the original foregoing Complaint to the Regional Hearing Clerk.

Ellen P. Palmisano

ELLEN P. PALMISANO
Clerk Stenographer

REFERENCE NO. 7

STRAUBING & RUBIN
CONSULTING ENGINEERS

6 SOUTH ORANGE AVENUE
SOUTH ORANGE, N. J. 07079

(201) 762-5950
TELEX NO. 138196

July 7, 1982

Dr. Richard Baker
Permits Administration Branch
Room 432
U.S. Environmental Protection Abency
26 Federal Plaza
New York, New York 10007

PERMITS
Jul 7 4 59 PM '82
ENVIRONMENTAL PROTECTION AGENCY
NEW YORK, N.Y. 10007

Re: 1. Cellofilm Corporation, Newark, New Jersey
EPA Id. Nbr. NJD000813451

2. Cellofilm Corporation, Wood-Ridge, New Jersey
EPA Id. Nbr. NJD001394303

Our Project No. C-1688

9/24/82

Dear Dr. Baker:

Attached are refilings of EPA Form 8700-12 (6-80) and EPA Form 3510-1 (6-80) for our client, Cellofilm Corporation. These forms apply to their facilities located at 45-5 Cornelia Street, Newark, New Jersey, and 241 Union Avenue, Wood-Ridge, New Jersey. In essence, these two facilities are refiling as only generators of hazardous waste. After further review of Cellofilm's operations, it was determined that neither facility is a T/S/D facility, nor do they transport hazardous waste as was stated on the original applications.

If there are any questions regarding the above, please contact the undersigned.

Very truly yours,

STRAUBING & RUBIN

Kenneth C Friis
Kenneth C. Friis

KCF:bmc
Attachments:

cc: Mr. S. Eysmann
Mr. P. Sullivan
Mr. R. Rossomando

Please print or type with ELITE type *(12 characters/inch)* in the unshaded areas only.

Form Approved OMB No. 158-3750
GSA No. 0246-EPA-OT

EPA — U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTIFICATION OF HAZARDOUS WASTE ACTIVITY

INSTALLATION'S EPA I.D. NO.	PLEASE PLACE LABEL IN THIS SPACE
I. NAME OF INSTALLATION	
II. INSTALLATION MAILING ADDRESS	
III. LOCATION OF INSTALLATION	

INSTRUCTIONS: If you received a preprinted label, affix it in the space at left. If any of the information on the label is incorrect, draw a line through it and supply the correct information in the appropriate section below. If the label is complete and correct, leave Items I, II, and III below blank. If you did not receive a preprinted label, complete all items. "Installation" means a single site where hazardous waste is generated, treated, stored and/or disposed of, or a transporter's principal place of business. Please refer to the INSTRUCTIONS FOR FILING NOTIFICATION before completing this form. The information requested herein is required by law *(Section 3010 of the Resource Conservation and Recovery Act).*

DETACH

FOR OFFICIAL USE ONLY

COMMENTS: C

INSTALLATION'S EPA I.D. NUMBER: F 1 | APPROVED | DATE RECEIVED (yr., mo., & day)

I. NAME OF INSTALLATION

CELLOFILM CORPORATION

II. INSTALLATION MAILING ADDRESS

STREET OR P.O. BOX: 3245 UNION AVENUE

CITY OR TOWN: 4 WOOD-RIDGE | ST.: NJ | ZIP CODE: 07075

III. LOCATION OF INSTALLATION

STREET OR ROUTE NUMBER: 5 45-5 CORNELIA STREET

CITY OR TOWN: 6 NEWARK | ST.: NJ | ZIP CODE: 07105

IV. INSTALLATION CONTACT

NAME AND TITLE *(last, first, & job title)*: 2 ROSSOMANDO, ROBERT VICE PRES | PHONE NO. *(area code & no.)*: 201-438-7100

V. OWNERSHIP

A. NAME OF INSTALLATION'S LEGAL OWNER: 8 CELLOFILM CORPORATION

B. TYPE OF OWNERSHIP *(enter the appropriate letter into box)*

F = FEDERAL
M = NON-FEDERAL

M

VI. TYPE OF HAZARDOUS WASTE ACTIVITY *(enter "X" in the appropriate box(es))*

- [X] A. GENERATION
- [ ] B. TRANSPORTATION *(complete Item VII)*
- [ ] C. TREAT/STORE/DISPOSE
- [ ] D. UNDERGROUND INJECTION

VII. MODE OF TRANSPORTATION *(transporters only – enter "X" in the appropriate box(es))*

- [ ] A. AIR
- [ ] B. RAIL
- [ ] C. HIGHWAY
- [ ] D. WATER
- [ ] E. OTHER *(specify)*:

VIII. FIRST OR SUBSEQUENT NOTIFICATION

Mark "X" in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your Installation's EPA I.D. Number in the space provided below.

- [ ] A. FIRST NOTIFICATION
- [X] B. SUBSEQUENT NOTIFICATION *(complete Item C)*

C. INSTALLATION'S EPA I.D. NO.: NJD000813451

IX. DESCRIPTION OF HAZARDOUS WASTES

Please go to the reverse of this form and provide the requested information.

EPA Form 8700-12 (6-80)

CONTINUE ON REVERSE

I.D. – FOR OFFICIAL USE ONLY

W

IX. DESCRIPTION OF HAZARDOUS WASTES *(continued from front)*

A. HAZARDOUS WASTES FROM NON–SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.31 for each listed hazardous waste from non–specific sources your installation handles. Use additional sheets if necessary.

1 F003	2 F005	3	4	5	6
7	8	9	10	11	12

B. HAZARDOUS WASTES FROM SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.32 for each listed hazardous waste from specific industrial sources your installation handles. Use additional sheets if necessary.

13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

C. COMMERCIAL CHEMICAL PRODUCT HAZARDOUS WASTES. Enter the four–digit number from 40 CFR Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

31 U031	32 U239	33 U220	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48

D. LISTED INFECTIOUS WASTES. Enter the four–digit number from 40 CFR Part 261.34 for each listed hazardous waste from hospitals, veterinary hospitals, medical and research laboratories your installation handles. Use additional sheets if necessary.

49	50	51	52	53	54

E. CHARACTERISTICS OF NON–LISTED HAZARDOUS WASTES. Mark "X" in the boxes corresponding to the characteristics of non–listed hazardous wastes your installation handles. *(See 40 CFR Parts 261.21 – 261.24.)*

☐ 1. IGNITABLE (D001) ☐ 2. CORROSIVE (D002) ☐ 3. REACTIVE (D003) ☐ 4. TOXIC (D000)

X. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this 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 penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE	NAME & OFFICIAL TITLE *(type or print)*	DATE SIGNED
Robert Rossomando	Robert Rossomando Vice President	6/25/82

EPA Form 8700-12 (6-80) REVERSE

ATTACH A

ATTACH A

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R01

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F N J D 0 0 0 8 1 3 4 5 1

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete items I, III, V, and VI. Except for the items that must be completed regardless of the items if no label has been provided, refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	MARK 'X' NO	MARK 'X' FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X	
B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X	
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)		X	
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	
J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP CELLOFILM CORPORATION

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 ROSSOMANDO ROBERT VICE PRES	201 438 7100

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 241 UNION AVENUE

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 WOOD-RIDGE	NJ	07079

PAB
EPA
[illegible]

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 45-5 CORNELIA STREET

B. COUNTY NAME

ESSEX

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 NEWARK	NJ	07105	

EPA Form 3510-1 (6-80)

CONTINUE ON REVER

66

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
7 2 8 6 9 (specify) INDUSTRIAL ORGANIC CHEMICALS	7 (specify)
C. THIRD	**D. FOURTH**
7 2 8 5 1 (specify) PAINTS AND VARNISHES	7 (specify)

VIII. OPERATOR INFORMATION

A. NAME: 8 CELLOFILM CORPORATION

B. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.): F = FEDERAL, S = STATE, P = PRIVATE, M = PUBLIC (other than federal or state), O = OTHER (specify): P (specify)

D. PHONE (area code & number): A 201 589 3871

E. STREET OR P.O. BOX: 45-5 CORNELIA STREET

F. CITY OR TOWN: B NEWARK

G. STATE: NJ

H. ZIP CODE: 07105

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ■ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): 9 N	D. PSD (Air Emissions from Proposed Sources): 9 P
B. UIC (Underground Injection of Fluids): 9 U	E. OTHER (specify): 9 (specify)
C. RCRA (Hazardous Wastes): 9 R	E. OTHER (specify): 9 (specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

This facility transports finished products from a facility that manufactures industrial resins and coatings. Small quantities of hazardous waste are generated when tank truck compartments are washed with Xylene, Toluene, and/or N-Butyl Alcohol to avoid cross-contamination between the various products being transported. Hazardous wastes are removed from the site within 90 day of their generation by an authorized waste hauler for proper disposal.

XIII. CERTIFICATION (see instructions)

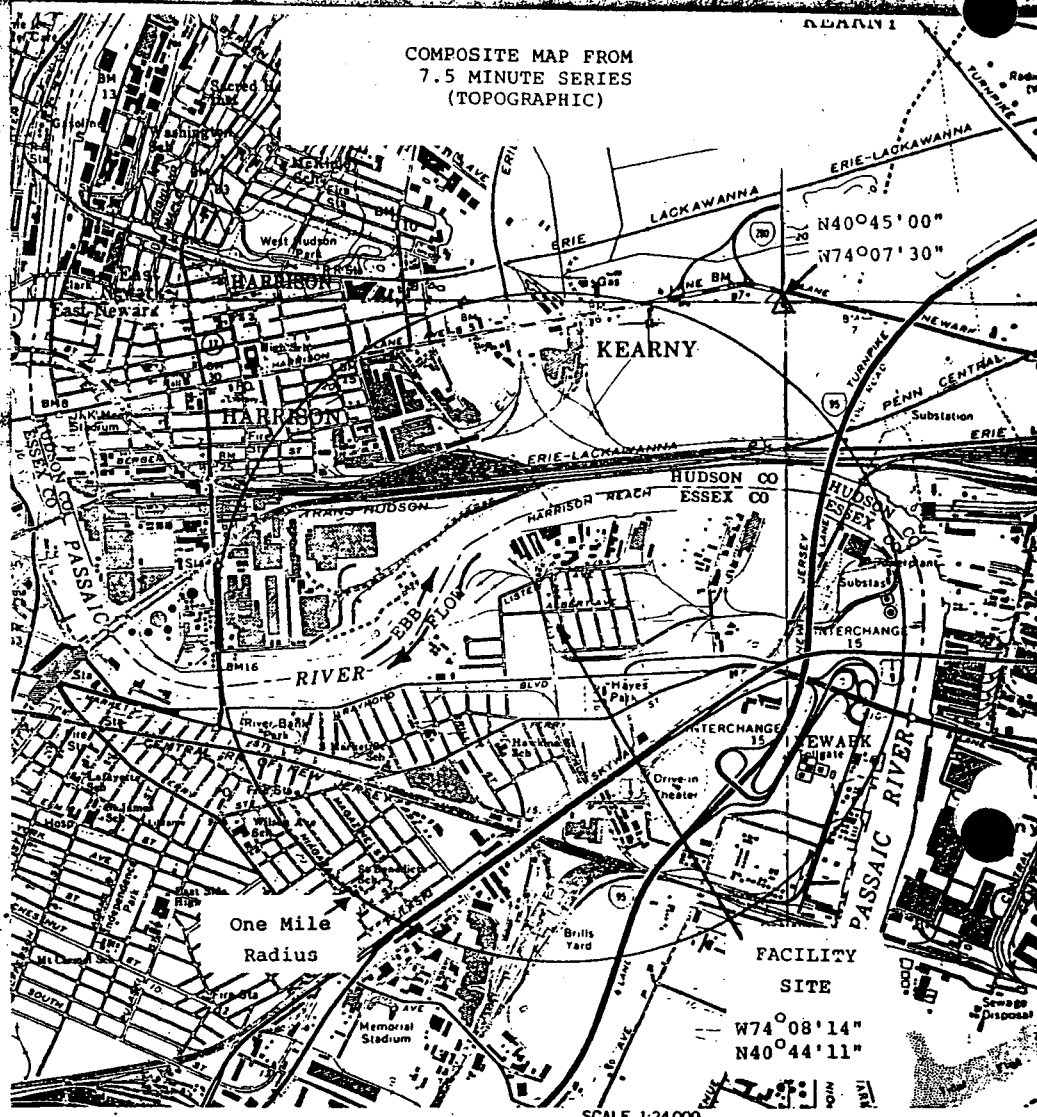
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Robert Rossomando Vice-President	Robert Rossomando	6/28/82

COMMENTS FOR OFFICIAL USE ONLY

C

EPA Form 3510-1 (8-80) REVERSE



SCALE 1:24000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

MN GN

11° 196 MILS

0°32' 9 MILS

UTM GRID AND 1967 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 4.8 FEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

REFERENCE NO. 8

TSD

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
32 E. Hanover St., CN 027, Trenton, N.J. 08625

Dr. Marwan M. Sadat
DIRECTOR

LINO F. PEREIRA
DEPUTY DIRECTOR

October 24, 1983

Mr. Robert Rossomando, Vice President
Cellofilm Corporation
241 Union Avenue
Wood-Ridge, New Jersey 07075

RE: Operating Status of Cellofilm Corporation, Newark Plant
EPA ID NO. NJD000813451

Dear Mr. Rossomando:

The Bureau of Hazardous Waste Engineering (the Bureau) is in receipt of a letter from Straubing & Rubin dated September 13, 1983 clarifying that the storage tank as delineated in your company's Part A application is an error and no such tank exists at this facility. The Bureau also received a letter from Straubing & Rubin dated July 7, 1983 requesting that the referenced facility be reclassified from a hazardous waste treatment, storage or disposal (TSD) facility to "generator only" status. According to your company's consultant's correspondence, it is the Bureau's understanding that the referenced facility accumulates on-site generated wastes in containers only for periods of 90 days or less.

Therefore, on the basis of this information, the Bureau classifies your facility solely as a generator provided all such waste is accumulated on-site and the following requirements of N.J.A.C. 7:26-9.3 and 40 CFR 262.34 are complied with:

1) All such waste is, within 90 days or less, shipped off-site to an authorized facility or placed in an on-site authorized facility, as defined at N.J.A.C. 7:26-1.4.

2) The waste is placed in containers which meet the standards of N.J.A.C. 7:26-7.2 and are managed in accordance with N.J.A.C. 7:26-9.4(d).

3) The date upon which each period of accumulation begins is clearly marked and visible for inspection on each container.

4) The generator complies with the requirements for owners and operators of N.J.A.C. 7:26-9.6 and 9.7 concerning preparedness and prevention, contingency plans and emergency procedures as well as N.J.A.C. 7:26-9.4(g) concerning personnel training.

New Jersey Is An Equal Opportunity Employer

This written acknowledgement of the delisting of the above identified facility from TSD facility status to generator status, is based expressly on the review of the aforementioned correspondence. This letter makes no claim as to the extent and physical condition of the actual hazardous waste activities occurring at the site mentioned above.

Your company's hazardous waste facility above is no longer included in DEP's list of "existing facilities" (see N.J.A.C. 7:26-1.4 and 12.3) and therefore does not need to conform with the interim operating requirements of N.J.A.C. 7:26-1 et seq. for "existing facilities". It is the company's responsibility to operate within the conditions listed above. To operate a hazardous waste facility without prior approval from the DEP is a violation of the Solid Waste Management Act N.J.S.A. 13:1E-1 et seq.

If you have any questions on this matter, please call my office at (609) 292-9880.

Very truly yours,

Frank Coolick

Frank Coolick, Chief
Bureau of Hazardous Waste Engineering

EP11/jb

c: Joel Golumbek
USEPA, Region II

Dave Leu, Ph. D.
NJDEP, DWM, BHWCM

REFERENCE NO. 9

CELLOFILM CORPORATIO
241 UNION AVENUE • WOOD-RIDGE, NEW JERSEY 07075 • (201) 438-7100 • N.Y. (212) 564-20

March 2, 1981

Mr. Bruce Adler, Attorney General Enforcement Branch
Enforcement Division
U.S. Environmental Protection Agency, Region II
26 Federal Plaza, Room 437
New York, N.Y. 10278

Dear Sir:

In answer to your letter of February 22, 1981, I am enclosing the following information:

Question I - Hazardous wastes:

Acetone
N. Butyl Alcohol
Di N Octyl phthalate
Ethyl Acetate
Methanol
Methyl Ethyl Ketone
Toluol
Methyl Iso Butyl Ketone
Xylene
Di Butly phthalate

Mixtures of all or some of the above are generated at the rate of approximately 100 gallons per week.

Question II -

No wastes have been removed in this period.

Question III -

E.P.A. identification number as a hazardous waste storage facility:

NJD000813451

Very truly yours,

CELLOFILM CORPORATION

RR.

Robert Rossomando
Vice President

RR/mb

REFERENCE NO. 10

PRELIMINARY ASSESSMENT
OFF SITE RECONNAISSANCE
INFORMATION REPORTING FORM

Date: 4-20-89

Site Name: CELLOFILM CORP. TDD: 02-8904-27-~~[illegible]~~ (EK)

Site Address: 45-5 CORNELIA STREET
Street, Box, etc.

NEWARK
Town

ESSEX
County

NEW JERSEY
State

NUS Personnel:

Name	Discipline
John Harrison	Field Tech
Ed Knyfd	Geologist

Weather Conditions (clear, cloudy, rain, snow, etc.):

~~55°~~ Clear

Estimated wind direction and wind speed: 5-10 mph S

Estimated temperature: 55°

Signature: [signature] Date: 4-20-89

Countersigned: [signature] Date: 4/20/89

PRELIMINARY ASSESSMENT

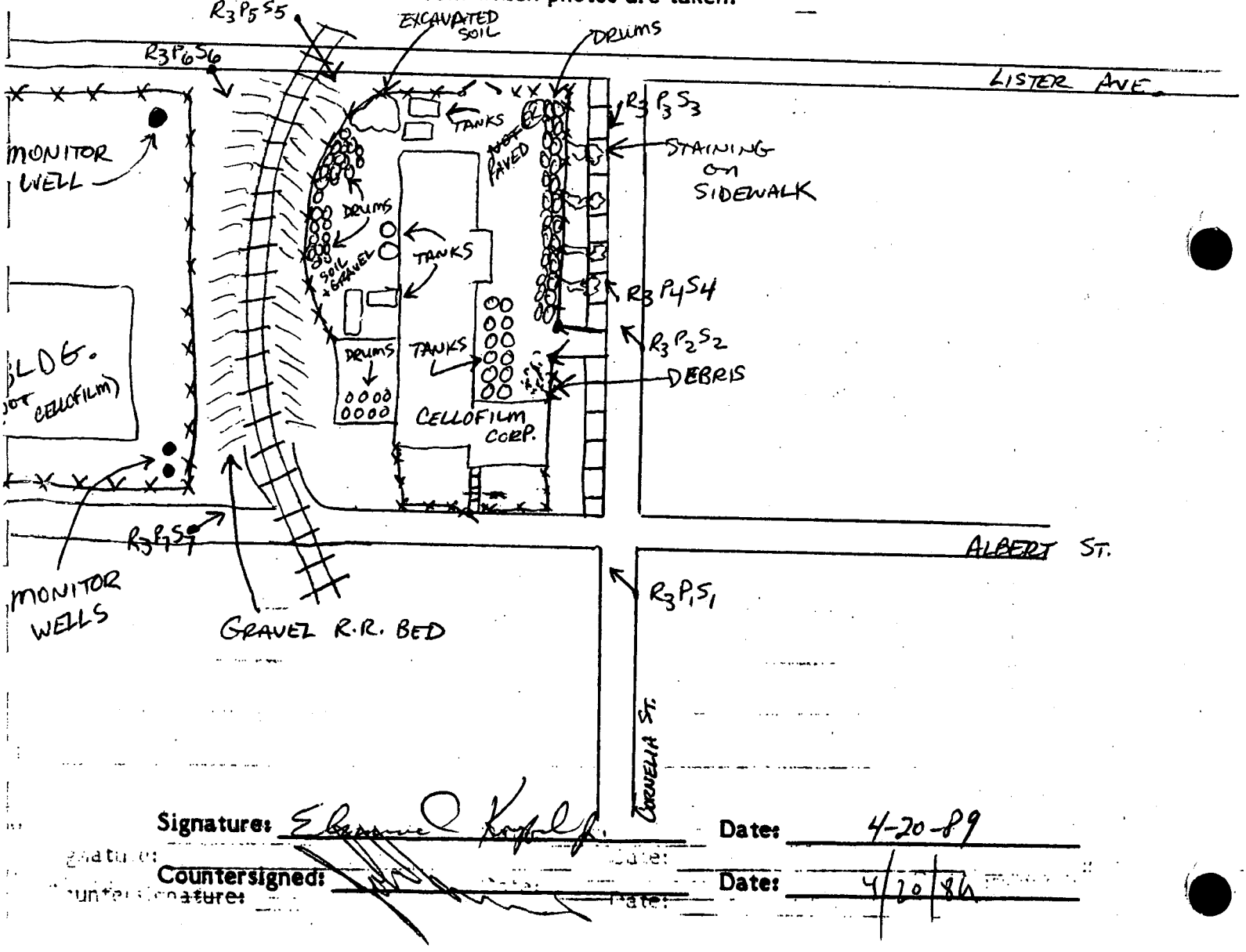
INFORMATION REPORTING FORM

Date: 4-20-89

Site Name: CELLOFILM CORP. TDD: 02-8904-~~06~~ 27 EX

Site Sketch:

Indicate relative landmark locations (streets, buildings, streams, etc.). Provide locations from which photos are taken.



Signature: [signature] Date: 4-20-89

Countersigned: [signature] Date: 4/20/89

PRELIMINARY ASSESSMENT

INFORMATION REPORTING FORM

Date: ~~14~~ (EX) 4-20-89

Site Name: CELLOFILM CORP. TDD: 02-8904-27 (EX)

Notes (Periodically indicate time of entries in military time):

Arrived at site at 1355. Facility is active. Facility slope is less than 1%. There is a large number of drums stored outside and behind the office; some are stacked on pavement and some are lying on the ground. There appeared to be some staining coming from the drum storage along Cornelia Ave onto the sidewalk next to the facility. Some drums were not filled and in poor condition (stored along the RR.). Most drums were in good condition.

Signature: [signature] Date: 4-20-89

Countersignature: [signature] Date: 4/20/89

PRELIMINARY ASSESSMENT

INFORMATION REPORTING FORM

Date: 4-20-89

Site Name: CELLOFILM CORP. TDD: 02-8904-27

Photolog:

Frame/Photo Number	Date	Time	Photographer	Description
R3 P1 S1	4-20-89	1355	JOHN HARRISON	Front of office from corner of Cornelia + Albert looking NW
R3 P2 S2	4-20-89	1359	JOHN HARRISON	side and back of office at process building and tanks
R3 P3 S3	4-20-89	1402	JOHN HARRISON	photo of drum storage along Cornelia street, south.
R3 P4 S4	4-20-89	1404	JOHN HARRISON	drum storage north along Cornelia street.
R3 P5 S5	4-20-89	1407	JOHN HARRISON	looking SE at drums and excavated soil, from Lister ave
R3 P6 S6	4-20-89	1410	JOHN HARRISON	looking SE at drums next to fence and RR tracks
R3 P7 S7	4-20-89	1415	JOHN HARRISON	view on W side of office at indoor drum storage.

Attach additional sheets if necessary. Provide site name, TDD number, signature, and countersignature on each.

Signature: Edward Kupfel Jr. Date: 4-20-89

Countersignature: [illegible] Date: 4/20/89

REFERENCE NO. 11

STATE OF NEW JERSEY

DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT

CHARLES R. ERDMAN, JR., COMMISSIONER

DIVISION OF WATER POLICY AND SUPPLY

HOWARD T. CRITCHLOW, DIRECTOR AND CHIEF ENGINEER

SPECIAL REPORT 10

PRELIMINARY REPORT ON THE GEOLOGY AND GROUND-WATER SUPPLY OF THE NEWARK, NEW JERSEY, AREA

By

Henry Herpers

and

Henry C. Barksdale

1951

Prepared in cooperation with the
United States Department of the Interior
Geological Survey

LETTER OF TRANSMITTAL

Honorable Charles R. Erdman, Jr., Commissioner
Dept. of Conservation & Economic Development

Dear Sir:

I am transmitting herewith a report on the ground-water supplies of the Newark, New Jersey, area prepared by Henry Herpers of the State Geologic & Topographic Survey, and Henry C. Barksdale, District Engineer of the United States Geological Survey. This report has been prepared in cooperation with the United States Geological Survey as a part of the cooperative investigation of the ground water resources of the State.

The report describes the geology and ground-water conditions in the City of Newark and its vicinity. It defines the limits of a gravel-filled preglacial channel, the existence of which has only been inferred heretofore. It describes the critical lowering of the water levels in the eastern part of Newark, and the rather general intrusion of salt water into the water-bearing formations in that area. The report points out that the safe yield of the water-bearing formations in parts of the area may have been exceeded, and that further large developments in other parts of the area should be made with great caution, if at all.

I, therefore, recommend that this report be published as a Special Report of the Division of Water Policy & Supply, in order that the information contained therein may be made available to the people of the State.

Respectfully submitted,

H. T. CRITCHLOW
Director & Chief Engineer

Encl.

October 22, 1951

DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY AND SUPPLY
520 EAST STATE STREET, TRENTON 9, N. J.

WATER POLICY AND SUPPLY COUNCIL

Thurlow C. Nelson, *Chairman*.....Highland Par

Max Grossman.....Atlantic Cit

Kenneth H. Murray.....Sea Gir

Joseph H. Palmer.....Tuckerto

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Roswell M. Roper.....East Orange

Herbert K. Salmon.....Stanhope

August C. Schultes.....Woodbury

Lillian M. Schwartz.....Paterso

John Wyack, *Secretary*

Howard T. Critchlow, *Director and Chief Engineer*

Charles R. Erdman, Jr., *Commissioner of Conservation and Economic Development*

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PRELIMINARY REPORT ON THE GEOLOGY AND GROUND-WATER SUPPLY OF THE NEWARK, NEW JERSEY, AREA

By Henry Herpers and Henry C. Barksdale

ABSTRACT

In the Newark area, ground water is used chiefly for industrial cooling, air-conditioning, general processing, and for sanitary purposes. A small amount is used in the manufacture of beverages. Total ground-water pumpage in Newark isestimated at not less than 20,000,000 gallons daily.

The Newark area is underlain by formations of Recent, Pleistocene and Triassic age, and the geology and hydrologic properties of these formations are discussed. Attention is called to the important influence of a buried valley in the rock floor beneath the Newark area on the yield of wells located within it. Data on the fluctuation of the water levels and the variation in pumpage are presented, and their significance discussed. The results of a pumping test made during the investigation were inconclusive. The beneficial results of artificially recharging the aquifers in one part of the area are described.

The intrusion of salt water into certain parts of the ground-water body is described and graphically portrayed by a map showing the chloride concentration of the ground water in various parts of the City. Insofar as available data permit, the chemical quality of the ground water is discussed and records are given of the ground-water temperatures in various parts of the City.

There has been marked lowering of the water table in the eastern part of the area, accompanied by salt water intrusion, indicating that the safe yield of the formations in this part of Newark has probably been exceeded. It is recommended that the study of the ground-water resources of this area be continued, and that artificial recharging of the aquifers be increased [illegible] as wide an area as possible.

INTRODUCTION

Purpose and scope of investigation

In the Newark area, the chief uses of ground water are for cooling by industries, for air-conditioning, and for general processing and sanitary purposes. Several beverage manufacturers use ground water as an ingredient in their products, and the water from a few wells is used for drinking. As one result of a recently completed survey of all known wells, it is estimated that not less than 20 million gallons of ground water is used in this area per day. In summer an estimated one to one and a half million gallons of ground water is used for air-conditioning alone.

Records kept by various well owners and by State and Federal agencies have shown a marked lowering of the water level in many Newark wells, as well as a diminution in the yield of some. They have also shown that the ground water in certain parts of the area has become brackish because of heavy pumpage and the infiltration of salt water from surface sources. These conditions are particularly severe in the eastern part of Newark, in what is known locally as the "Ironbound District." In order to give some conception of the seriousness of these conditions, it may be mentioned that in the year 1879 the water level in wells in eastern Newark ranged from a few feet above to 25 feet below the surface of the ground, and several 8-inch wells yielded as much as 500 gallons per minute when pumped by direct suction. Analyses of the water from these wells showed that it contained only 10 to 25 parts per million of chloride.[1]

1/Annual report of the State Geologist, p. 126 ff., 1879.

Analyses made by the City Chemist of Newark showed chloride contents ranging from 250 to 2,500 parts per million in water taken from wells in 1942, in this same area. Moreover, in 1947 the general water level ranged from 125 to 200 feet beneath the land surface, and pumping levels in wells ranged from 135 to 290 feet, depending upon the amount of water pumped and the season of the year. In view of these facts, it was decided to make an intensive study of the geology and ground water of the Newark area, and to publish a report on the findings, in order to summarize and make generally available our knowledge of the quantity and quality of ground-water resources of the area, and to facilitate the planning of ground-water pumpage in the future.

The area included in the present study and referred to herein as the Newark area is shown on figure 1. It lies principally in Essex County, but includes small parts of Hudson and Union Counties. It includes all of the city of Newark, except the extreme western part; the greater part of Harrison; and parts of Kearny, Irvington, East Orange, Bloomfield, and Elizabeth.

The Newark area lies wholly within the physiographic province known as the Piedmont Plain. The southeastern part of the area is a lowland with considerable tidal marsh, and the balance of the area is characterized chiefly by low ridges trending in a northeasterly direction. The average annual rainfall at Newark is approximately 47 inches, and the mean annual temperature is about 53°F.

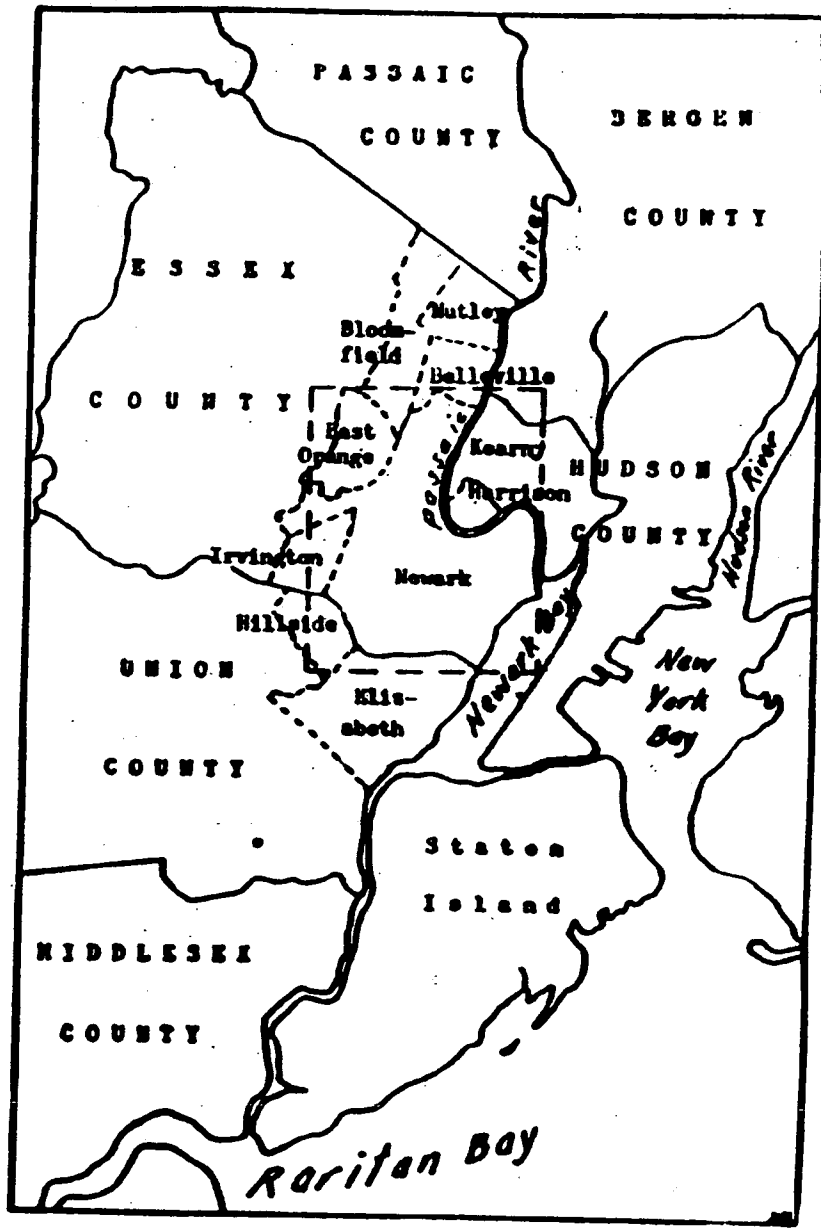

Figure 1.-Map of northeastern New Jersey, showing location of the Newark area.

Acknowledgments

This report is the result of cooperative work by the Geologic and Topographic Survey and the Division of Water Policy and Supply, both of the New Jersey Department of Conservation and Economic Development, and by the United States Geological Survey. M. E. Johnson, State Geologist, H. T. Critchlow, Director of the Division of Water Policy and Supply, and A. N. Sayre, Geologist in Charge, Ground Water Branch, U. S. Geological Survey, have exercised general supervision over the work since its beginning. Mr. Johnson and Henry C. Barksdale, District Engineer of the Ground Water Branch, U. S. Geological Survey, have shared local responsibility for the progress and details of the work. The gathering of the data necessary for the preparation of this report has been largely in the hands of Henry Herpers of the Geologic and Topographic Survey and Jerome M. Ludlow of the U. S. Geological Survey. The greater part of this report was written by Mr. Herpers. The sections on the hydrology of the various formations were written by Mr. Barksdale.

Needing the help of the citizens and industries of Newark, and believing that they would gladly cooperate if they knew the facts, the Newark Chamber of Commerce was advised of the proposed survey and report, and a story giving the reasons for the work and indicating its importance was given the press early 1947. It is now the authors' pleasure to express their sincere appreciation of the help given the project by almost everyone approached. The work of gathering data was materially facilitated by the assistance of the following well contractors: Artesian Well and Equipment Co., C. W. Lauman & Co., Layne-New York Co., Parkhurst Well and Pump Co., Rinbrand Well Drilling Co., Samuel Stothoff Co., and William Stothoff Co. Especially valuable data on the operating characteristics of their wells, and other aid, were freely given by Mr. B. H. Bishop and other engineering personnel of P. Ballantine & Sons and by Mr. Wm. E. Helmstaedter, Mechanical Engineer, and others of the Celanese Corporation of America. Particular acknowledgment is made of the assistance rendered by P. Ballantine & Sons in making their well field available for pumping tests and altering their plant routine to meet the requirements of the test. The Division of Water and the Department of Health of the City of Newark have assisted materially in locating wells and in furnishing records of analyses of well water.

OUTLINE OF GEOLOGY

The Newark area lies wholly within the section of New Jersey underlain by the Newark group of rocks of Triassic age. These rocks form a belt extending from the Hudson River across central New Jersey, Pennsylvania, and Maryland, and into Virginia. They consist of shale, sandstone, argillite, and conglomerate with included sheets, sills, and dikes of trap rock (basalt and diabase).

In New Jersey, the sedimentary rocks of the Newark group have been divided on the basis of their lithology into three units. The lowest is chiefly red, buff, or gray arkosic sandstone and is called the Stockton formation; the middle unit, called the Lockatong formation, is composed largely of gray, purplish-gray, or dull-red argillite; and the uppermost unit, the Brunswick formation; consists chiefly of soft red shale and red sandstone. The Brunswick formation is the bedrock throughout the Newark area. In general, the strata have been tilted northwestward and locally they have been warped into gentle flexures with occasional faulting. The harder beds form ridges, most of which trend northeastward.

The northern part of the belt of Triassic rocks was glaciated in late geologic time, so that much of the surface is covered with a mantle of glacial drift, which in many places is thick enough to conceal the bedrock surface. Although the bedrock crops out in only a few places, it accounts for the relief in the western part of the Newark area. There the covering of glacial drift is thin. In the eastern section the bedrock is concealed by thick deposits of silt and clay with

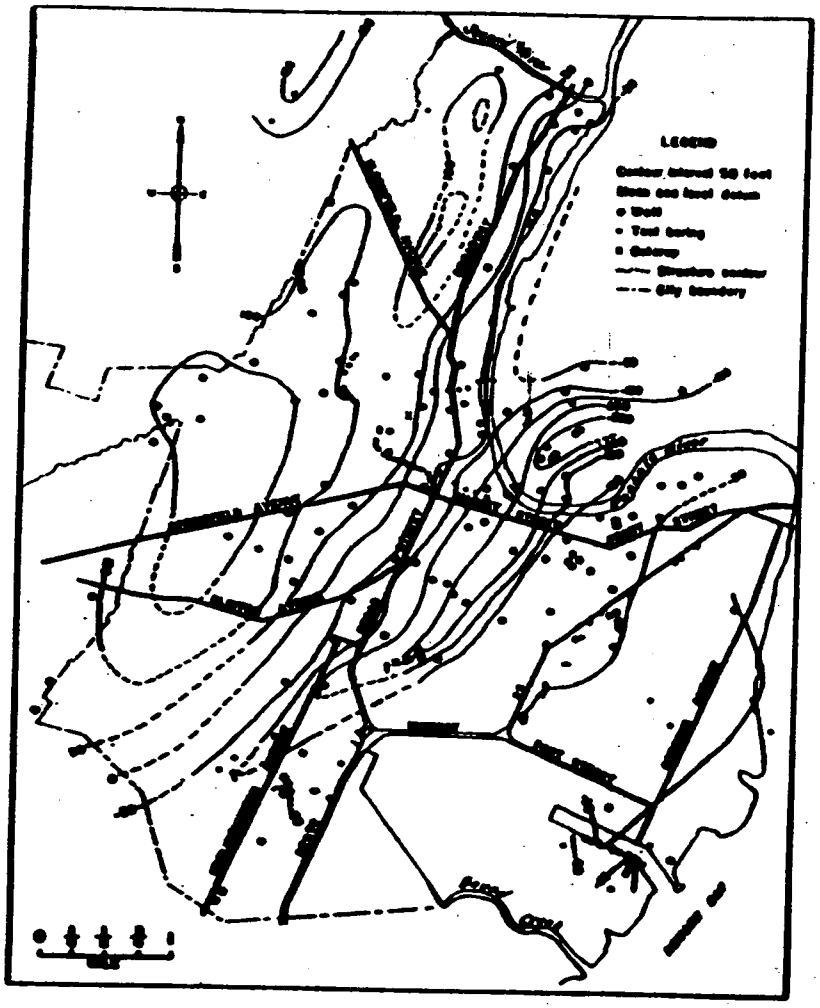

Figure 2.--Map showing elevation and configuration of bedrock beneath Newark, N. J., and vicinity.

thinner beds of sand and gravel, and, although topo graphically this region is a plain, borings have show that the surface of the underlying bedrock does no conform with the ground surface. (See figure 2) The valleys of many of the streams in the glaciate area contain terraces of sand and gravel of glacia origin.

The geologic history of the area since the beginnin of Triassic time is relatively simple. During Triassi time, sands and muds were deposited in an arid basin Near the end of Triassic time the beds were faulted an tilted toward the northwest. Later erosion reduced th surface to a plain, over which the sea then advanced a indeterminate distance to the northwest. Sands an clays, such as those found in the coastal plain, wer deposited in this sea. Still later, the sea withdre and the forces of erosion removed the sediments of th coastal plain and then etched out the larger topographi features that we see today. During the Pleistocen epoch the details of the topography were altered by th ice. Hills were smoothed somewhat and much drift wa deposited. The drift in some places filled valley existing prior to glaciation and effected importan changes in drainage. A general rise of sea level at th close of the Pleistocene epoch flooded low areas ad jacent to the coast, forming Newark Bay at the junctio of the Hackensack and Passaic Rivers. Since then th meadows have been formed by stream deposits, an very, very recently -- in terms of the geologic calenda -- much meadowland has been reclaimed by suitable drain- age and by filling. A typical example of such "made land is the area upon which Newark Airport has been buil

The succession of formations in the Newark area arranged in normal sequence (i.e., youngest formatio at top) is shown in the following table:

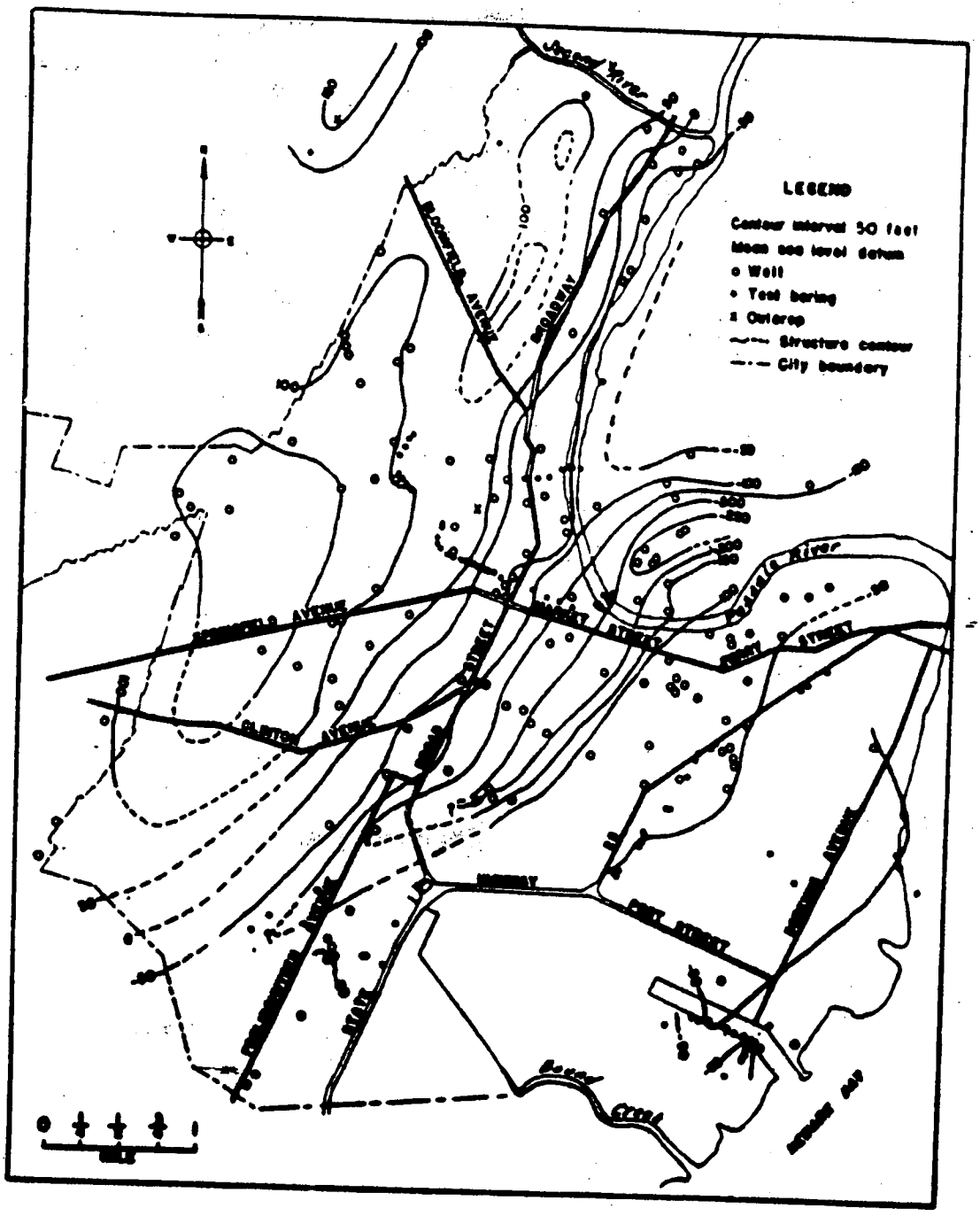

Figure 2.-Map showing elevation and configuration of bedrock beneath Newark, N. J., and vicinity.

Table 1.--Stratigraphic table in the Newark area

Cenozoic era
- Quaternary system
  - Recent series
    - Alluvium and meadow muck
  - Pleistocene series
    - Glacial till and stratified deposits of glacial origin

UNCONFORMITY

Mesozoic era
- Triassic system
  - Newark group
    - Brunswick formation

UNCONFORMITY

Older rocks[2]

2/The deepest well drilled in Newark failed to pass through the red shale and sandstone at 2,538 feet. It cannot, therefore, be stated with certainty what sort of rock lies below the city at great depths. From the general geology of the Triassic rocks, presumably the Palisade diabase would be found at great depth, and more rocks of the Newark group below the diabase. Below the Triassic rocks lie crystalline rocks of very great age which extend to an undetermined depth.

HYDROLOGY AND GEOLOGY OF THE ROCK FORMATIONS

Recent deposits

Recent deposits are found mainly in the eastern part of the Newark area where they occur in the tidal marshes or meadow lands along Passaic River and bordering Newark Bay. They consist largely of unconsolidated mud and silt with inclusions of peat and other organic materials and occasional lenses of sand and gravel. They have been deposited on top of the Pleistocene sediments, or perhaps in places directly on the Triassic rocks, by the Passaic and Hackensack Rivers and by smaller streams flowing across the area and discharging into those rivers, or into Newark Bay. The Recent deposits range in thickness from a feather edge to 35 feet.

Hydrologically, the Recent deposits are of relatively little importance except as they may transmit water to the underlying rocks or exclude it from them. Their permeability is relatively low and they occur in the parts of the area that are exposed to salt water. Therefore their action as a barrier in retarding the percolation of salt water into the underlying rocks is perhaps their most important function. In this respect they perform imperfectly because there probably are breaks in the cover that they provide at critical points, such as the ship channels in the river and in the bay.

Pleistocene deposits

The Pleistocene deposits in the Newark area are all of glacial origin. They consist of till--an unconsolidated, unstratified, heterogeneous mixture of clay, boulders, and sand--and stratified glacial drift, which is composed of sand and gravel that have been more or less sorted and stratified by the action of glacial waters. The deposits of glacial origin overlie the bedrock throughout practically all the Newark area, the bedrock cropping out only in a few more or less isolated spots. The thickness of the Pleistocene deposits varies greatly. In the western part of the area they are only a few feet thick, forming a thin veneer [illegible] the underlying bedrock, but in the eastern part of the area they

are so thick that they mask entirely the topography of the underlying rock. The map of the elevation and configuration of the bedrock beneath Newark, N. J., and vicinity (figure 2) shows that, in the area east of Broad Street, there is a large deep valley cut in the bedrock, which is entirely covered by glacial drift. At the surface this area presents the aspect of a plain. The depth to rock in the buried valley ranges from 125 feet to more than 190 feet in Newark, and to as much as 300 feet in Harrison. Farther east in the Newark area, bedrock lies at lesser depths. The buried valley extends northeastward across the city from its southwestern boundary, crossing Frelinghuysen Avenue near its northern end, and then extends east of and roughly parallel to Broad Street, finally crossing over into Harrison, where it bends eastward. It has not yet become possible to show the extension of the valley to the southwest or to the east because of the lack of sufficient reliable boring data, but its course and shape across the city of Newark is fairly accurately known. From its shape as shown on plate 1, it is apparent that the valley slopes toward the northeast, and this direction is therefore the probable direction of flow of the river that cut the valley prior to the Pleistocene epoch.

The character of the Pleistocene deposits varies throughout the Newark area. In general, these deposits consist chiefly of till in that part of the area lying west of Broad Street, whereas the cuttings taken from many test borings and wells in the eastern part of the area show that the Pleistocene deposits there consist largely of stratified materials with interbedded lenses of till. (See logs 1 to 4 in appendix.)

The Pleistocene deposits in the bottom of the buried valley are worthy of special attention. In the southwestern part of the Newark area they consist for the most part of fine sand and clayey sand, but in the northeastern part the bottom of the valley contains deposits of coarse sand and gravel which in many places contain much water. (See logs 1 and 2 in appendix.) In fact, some of the best wells in the Newark area pump from these deposits.

Other coarse deposits of glacial origin are found in the valley of the Passaic River north of the point where

the river makes its great eastward bend.

The Pleistocene deposits are one of the two maj aquifers in the area. Their hydrologic function twofold. In the first place, under favorable ci cumstances they yield water in substantial quantiti directly to wells. In the second place, they abso and store water from precipitation and from surfa sources and transmit it to the underlying rocks.

Where the deposits contain beds of sand and grav that are thick enough and extensive enough, they yie large quantities of water to wells finished in the Insofar as is known, these conditions are limited almos entirely to the buried valley, where several well yielding from 175 to more than 600 gallons per minut have been developed. For example, a well drilled fo the Driver Harris Co. in Harrison near the locality wher the buried valley crosses the Passaic River yielde 600 g.p.m. with a draw down of approximately 60 feet.

Detailed and extended records of water levels in an of pumpage from wells in this aquifer are not available It is therefore impossible to say at this time whether water is being withdrawn from this aquifer at a rate less than, equal to, or greater than the rate at which recharge is available. The fact that two or three million gallons of water have been withdrawn daily for a number of years from the sand and gravel in the buried valley suggests that a large quantity of recharge occurs. On the other hand, the fact that the static water levels in some wells tapping this aquifer are now substantially below sea level suggests caution before further developments are made.

A more definite and immediate threat to the safe yield of the gravels of Pleistocene age is the apparent intrusion of salt water from surface sources. Wells near the point where the buried valley crosses the Passaic River are yielding water that contains 200 to 500 parts per million of chloride and is already unsuitable for some uses. Inasmuch as there is hydraulic continuity between the gravels and the underlying rocks, the problem of salt-water intrusion will be discussed in more detail in a section of this report that deals primarily with the water supply from the rocks.

The second function of the Pleistocene deposits, that of absorbing, storing, and transmitting water to the underlying rocks, is, in the aggregate, more important than their yielding water directly to wells. As already indicated, they overlie the rocks to varying thicknesses throughout most of the area. In general, there appears to be some correlation between the thickness and nature of the Pleistocene deposits and the yield of wells tapping the underlying rocks. This is to be expected because the storage capacity of the rocks is relatively low and sustained large yields can be obtained from them only if some adequate source of recharge is available. Where the overlying deposits are thick and moderately porous and permeable, they supply the necessary recharge. On the other hand, where they are thin or relatively impermeable, they may fail to supply recharge to the rocks or may even retard the movement of water into them.

Newark group

Brunswick formation

Geology

As mentioned previously in the outline of the geology of the Newark area, the sedimentary rocks of the Newark group of Triassic age in New Jersey have been divided upon the basis of their lithology into three units--the lower, or Stockton formation, the middle, or Lockatong formation, and the upper, or Brunswick formation. It should now be pointed out that whereas these lithologic distinctions can be made in central New Jersey, they are not apparent in the northern part of the belt of Triassic rocks. The Lockatong formation does not continue farther northeastward than Franklin Park, Middlesex County, and the distinction between the Stockton and Brunswick formations is no longer obvious, as it is farther southwestward, because the whole Newark group becomes, in general, coarser-grained. In the northern part of the State, particularly in Bergen County, these sediments become predominantly sandy and even conglomeratic. In the Newark area, the tendency of the rocks to increase in coarseness toward the northeast is shown [illegible]e fact that wells drilled in the southern part,

near the Elizabeth line, have penetrated rock that chiefly soft red shale, whereas in north Newark, es cially near the Belleville line, the rocks are principa sandstone with interbedded shale. In fact, during latter part of the last century several sandstone qu ries were operated in north Newark, especially al Bloomfield Avenue and in the southern part of Bra Brook Park. The change from soft shale to hard sa stone is reflected in the change in topography f a rather flat, low-lying plain with few rock hills southern Newark to hills with rather pronounced rel in the northern part of the city. In the Newark ar therefore, the bedrock is all designated as Bru wick formation. A representative section showing variations in the rock under Newark is shown in log (See appendix 1.)

The bedrock originated as sand, silt, and mud wh were derived from the erosion of older rocks northw and southeast of the great basin in which the sedime were laid down during the Triassic period. Three tim during the period of deposition great sheets of basalt lava were poured out on the surface and were then buri by sediments later in the Triassic. The remnants the flows now form the Watchung Mountains, but it impossible to state whether or not the flows ever e tended as far east as the Newark area, for there are igneous rocks of this type in that area, so far as known. Toward the end of the Triassic period, the sed ments were intruded by similar magma which apparent did not have enough force to push through to the surfa but spread out beneath the surface in a great sill so 900 feet or more thick, usually following the beddi planes of the sediments but frequently cutting acro them. Because of erosion, the sill is exposed today the Palisades in eastern Hudson and Bergen Counties a also in certain mountains in central New Jersey. At t close of Triassic time, the entire Newark group of roc were tilted toward the northwest, which is their attitu today and in the process they were faulted and great fractured.

The total thickness of the rocks of Triassic age the Newark area is unknown but is [illegible]mated at abou 6,000 to 7,000 feet.

The deepest well drilled in Newark reached a depth of 2,538 feet and failed to pass through the normal red shales and sandstones. It is therefore impossible to state with accuracy what lies below that depth, but presumably a well drilled to great depth in Newark would eventually strike the Palisade diabase, and below that would strike more sedimentary rocks of Triassic age before entering the crystalline basement rocks upon which the Triassic sediments were deposited.

Hydrology

GENERAL. --

The Brunswick formation yields water primarily and almost exclusively from the cracks in the rocks of which it is composed. The primary pore spaces in the rocks are generally so small that water moves through them very slowly, if at all, under the hydraulic gradients that are established by pumping. Were it not for the fact that the formation has been extensively cracked and fractured, and has thus acquired a kind of secondary permeability, it would yield very little water.

There is in the Brunswick formation a kind of modified water-table condition wherein the water is generally free to move in any direction and seek the level determined by the factors affecting recharge and discharge. The various systems of cracks intersect so that water can move more or less freely in all directions. However, the cracks are not of uniform size and capacity in all directions, and water is likely to move more freely in some directions than in others. For the area as a whole, there may be no one direction that is generally more favorable to flow than others. It probably differs from place to place.

The capacity of the formation to store and transmit water decreases with depth. As greater depths are reached, the weight of the overlying materials increases and tends to close the cracks. Thus less and less space is available to store water and the resistance to its movement is increased. It is probable that the cracks that are horizontal, or nearly so, are first affected and most affected in this way. The horizontal crac tend to distribute water uniformly in all direction so that the tendency of the water to flow in the directi of the prevailing vertical cracks is probably accent ated with depth. The cracks along the bedding plane which appear to be very numerous near the surface a are more nearly horizontal than vertical, probably a less and less important with depth.

There is, therefore, little foundation for the comm belief that water is transmitted for long distance underground through the Brunswick formation, particular along the bedding planes of the rocks. It is unlikel that the bedding planes, or rather the horizontal crack along them, provide the path of least resistance to th flow of water. Actually, water probably flows throug the formation most readily in vertical or nearly vertica cracks. Except along major faults, individual vertical cracks are not likely to extend very far without interruption, and are not likely to transmit water for distances greater than 2 or 3 miles. Furthermore, as the vertical cracks necessarily intersect the rock surface locally, they will receive recharge or discharge water locally depending upon the hydraulic gradient.

Certain characteristics of individual wells in the area may be better understood in the light of the foregoing general description of the rocks from which they draw their water. The yield of a well tapping the Brunswick formation depends primarily upon the number and size of the cracks that it encounters below the water table, or more specifically upon their capacity to transmit water. Thus, two adjacent wells may pass through almost identical layers of rock, and one may yield a substantial quantity of water whereas the other may yield very little, depending upon the character of the cracks encountered in each. It is therefore impossible to predict the yield of a proposed well except in general terms based upon the average yield of other wells in the vicinity. Furthermore, all predictions of yield of wells in the Brunswick formation should be qualified by a statement that the final proof must be the actual yield of the finished well, because the number and capacity of the cracks encountered cannot be determined in advance.

There is usually little or nothing to be gained by deepening an unsuccessful well below the average depth of the productive wells in the area, because the cracks become smaller and probably less numerous with increased depth. It is almost always wiser to move to another site, even if only a short distance away, and to drill another well, rather than to double the depth of a poor well in the hope of improving its yield. It is obviously impossible to determine the nature and pattern of the deeply buried cracks at any site from observations at the surface. There are, of course, rare exceptions to this general rule, but it holds well enough to make its observance sound economic policy. For example, it has already been mentioned that one well in Newark was drilled to a depth of more than 2,500 feet. That well, though very expensive, was unproductive.

As a general rule, in the Brunswick formation most of the productive cracks occur within the first 200 or 300 feet of the rock. In some parts of the Newark area, however, most of the productive wells penetrate the rock 400 or even 500 feet. Sufficient data are not available to indicate whether the rock there is unusually productive at great depths or whether many of these wells are unnecessarily deep, because most of them were not tested before they had been drilled to their full depth. It is possible that the bottom parts of many of these holes are not very productive.

An interesting though probably extreme example of a well that was unproductive at depth is one about 800 feet deep that was observed in the course of the studies preceding this report. When the regional water level declined, the yield of this well dropped sharply. With the thought that some of the productive cracks might have been clogged either in the drilling or subsequently, the owner employed a driller to clean out and redevelop the well. A thorough job was done and it is unlikely that there remained any cracks that were sealed with mud or otherwise clogged. Nevertheless, the yield of the well did not improve substantially. It was therefore abandoned and made available as an observation well. During the spring and early summer of 1947 the water level in the well declined normally to a level of 161 feet below mean sea level, where it [illegible]pped abruptly. While the water levels in other observation wells in the vicinity continued to decline to about 230 feet below mean sea level and the pumping levels in some adjacent wells were still lower, the water level in this well remained at 161 feet. In the late fall and winter, after the regional water level had recovered to 161 feet, this well again became responsive to variation in pumpage and fluctuated normally. The same performance was repeated in the summer of 1948 and again took place in 1949. Apparently the only explanation for the peculiar behavior of the water level is that no cracks were encountered below 161 feet and that therefore the well is water-tight at greater depths. This is, no doubt, an unusual case, but it does serve to emphasize the dependence of the yield of rock wells upon cracks, as well as the relative unimportance of horizontal cracks at depth and the decreased chance of hitting good cracks at increased depth.

The character of the Brunswick formation as an aquifer also explains another peculiarity of the wells that tap it. Ordinarily, in a relatively uniform aquifer, the interference between two or more wells is dependent mainly upon the distance between them. In the Brunswick formation, as in similar aquifers, a pumping well often affects the water level in a second well substantially more than that in a third well at the same distance but in a different direction. The explanation of this peculiarity, of course, lies in the fact that the different systems of cracks differ in their capacity to transmit water.

The Brunswick formation does not yield water as freely as some of the other important water-bearing formations in the State, especially those that yield water from the pore spaces in well-sorted medium-to coarse-grained sand and gravel. This is due primarily to the fact that its capacity to store and transmit water is smaller. The deficiency is most marked in regard to its capacity to store water. The specific yield (the storage capacity expressed as a percentage of the volume of the aquifer) of a coarse, well-sorted sand is frequently as much as 25 percent. The specific yield of the upper 300 feet of the Brunswick formation, based upon the volume of cracks, is probably more nearly in the o[illegible]r of 1 or 2 percent. Therefore, it is easy to und[illegible]d the hy-

drologic importance of sources of ready recharge such as bodies of surface water or of relatively permeable sand and gravel in areas where large quantities of ground water are withdrawn from the formation. The capacity of individual cracks to transmit water is probably larger than that of a comparable volume of pore spaces in a sand. It is not surprising, therefore, to find that the capacity of the Brunswick formation to transmit water is about one-fourth of that of some of our important sand aquifers in spite of the relatively limited volume of cracks.

Pumping Tests – In January 1949, through the cooperation of the officials of P. Ballantine & Sons, two pumping tests were run on wells tapping the Brunswick formation. For several days all the company's wells were operated to suit the requirements of the test. At each of their two plants two wells were run continuously until conditions approaching equilibrium were established. This involved wasting water at some times of the day in order to have an adequate supply available at others, but it seemed to be the only practical way of reaching an approximate state of equilibrium. After about 24 hours, the effects of changing the rates of pumping at the plant appeared to have been eliminated, and, with one exception which will be discussed later, the effects of pumping at other plants in the area seemed to be of little importance.

The wells pumped during the two tests are shown on figure 3. They were selected to provide the best possible spread of observation wells in as many directions as possible. The first test was made by pumping well 1 at plant 1. This well is centrally located, and water levels were observed in seven other wells at various distances and directions from it. In the second test, well 9 at plant 2 was pumped and water levels were observed in the same group of observation wells. In this test, however, the pumping well was in one corner of the well field so that the distances to the observation wells were greater and their directions were less varied.

During the pumping tests, water-stage recorders were maintained on well 5 at plant 1 and on wells 8 and 10 at plant 2. The water levels in well 7 at plant 1 were measured by air pressure, using an 8-inch pressure gage on which it was possible to note changes of water level of one- or two-tenths of a foot. The water levels in the other wells were measured by air pressure, using ordinary pressure gages that would probably not indicate changes of water level of less than one foot. There were only four wells, therefore, in which water levels could be observed accurately; of these wells 5 and 7 at plant 1 appear to have been drawn down below the most productive cracks encountered in them. The best observations were therefore obtained in wells 8 and 10 at plant 2. Two of the wells observed, wells 4 and 8 at plant 1, were operated continuously during both tests to supply water for manufacturing purposes.

During the first test a prompt and distinct effect was observed in well 8, plant 2, when well 1, plant 1, was started and again when it was shut down. This seemed to indicate that these two wells tapped the same system of cracks. No distinct effect was observed in any of the other wells during this first test, even though it was continued for several hours. Well 7 at plant 1 is almost in a straight line with well 8, plant 2, and well 1, plant 1. It is in the opposite direction from well 1 and only about half as far away, yet no effect was observed in it. No definite effects of pumping or shut-down were observed in any of the other wells.

During the second test, when well 9, plant 2, was pumped a prompt and distinct effect was observed in well 10, plant 2, both at the beginning and at the end of pumping. None of the other wells being observed showed any distinct effect. It is interesting to note, however, that the recorder on well 10 showed a small but definite effect whenever well 27 at the plant of the Celanese Corporation of America was started or stopped. This well is approximately southwest of well 10 and about 2,400 feet from it, a distance substantially greater than that between any of the wells at the Ballantine plants.

It is believed to be significant that all the wells that were observed to affect one another during the

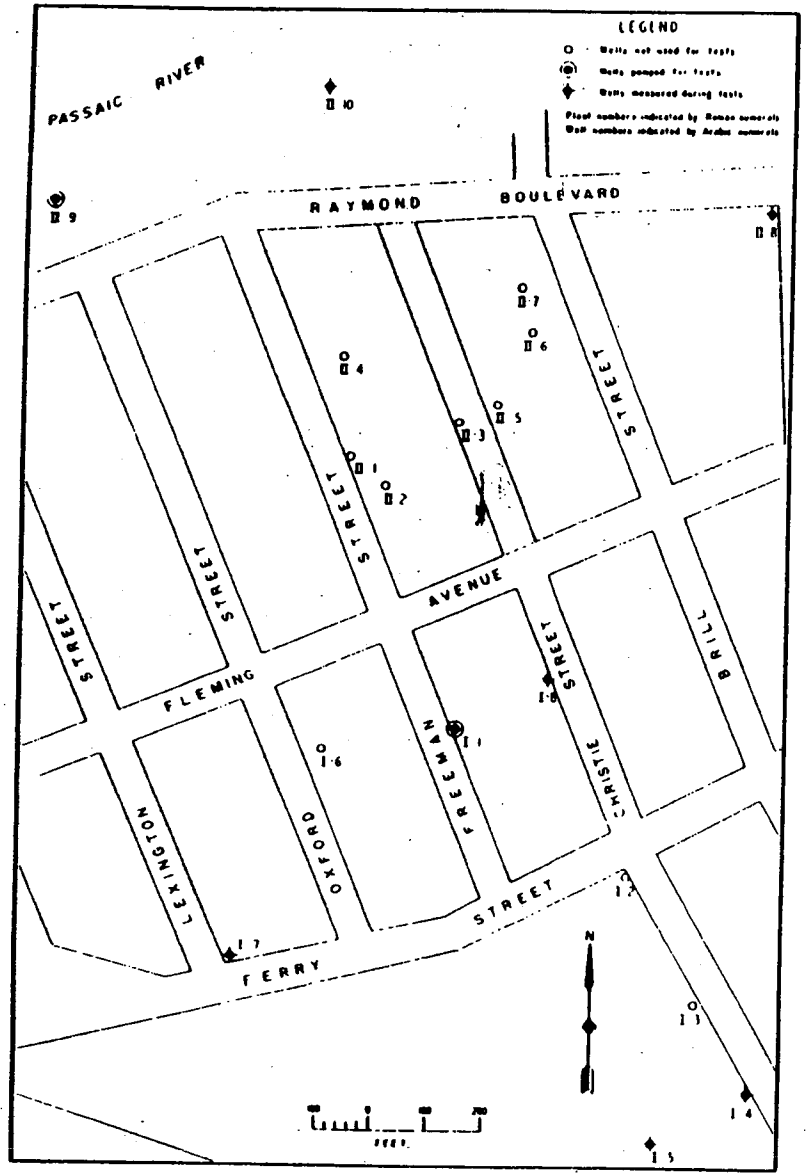

Figure 3.-Map of a part of Newark, N. J., showing the location of wells at the plants of F. Ballantine & Sons and indicating the wells used for pumping tests in January 1949.

two tests at the Ballantine plants lay along lines trending in a general northeasterly direction. This seems to indicate that in the vicinity of the Ballantine and Celanese plants there is a dominant system of cracks in that direction. No doubt there are cracks in transverse directions, but their capacity to transmit water appears to be much smaller. Consequently, water moves through the cracks that trend northeast much more easily than it does in other directions and the primary interference between wells is to the northeast or southwest.

One result of this distribution of cracks is that the formulae used to compute coefficients of transmissibility and storage are not applicable to this area. These formulae are based upon the assumption, among others, that water can move freely through the aquifer in all directions. In some other localities where the distribution and character of the cracks are more nearly equal in transverse directions, it is believed that these formulae can be applied significantly to wells in the Brunswick formation. In this part of Newark, however, they do not apply.

The tests were not without significant results, however, merely because it was impossible to compute the usual coefficients from them. For example, in planning the locations of future wells, it should be useful to know the direction in which they will interfere most with each other or with existing wells. Similarly, it might be possible to plan an operating schedule that would minimize interference between wells and thus decrease somewhat the pumping lift. Artificial recharge will be most effective if it is distributed in a direction transverse to the major cracks, thus supplying more of them without depending upon the poorer cracks to distribute the water. The movement of contaminating materials such as salt water from the river or bay is probably most easily accomplished in a northeasterly or southwesterly direction after it reaches the rock. The structure of the rock does not, of course, affect appreciably the movement of such contaminants through the materials above the rock.

Long-term fluctuations of water levels and pumpage - In the investigation that preceded this report, it was found that relatively few well owners had [illegible]t accurate and continuous records of pumpage and th[illegible] [illegible]ll fewer

had more than an occasional record of the water levels in their wells. Fortunately, important exceptions to this general rule were some of the larger users of ground water. In only one part of the area, however - the so-called "Ironbound District" in eastern Newark - was it possible to obtain sufficient data to justify a long-time estimate of pumpage rates and to compare it with similar records of water levels. In this area the two largest users of ground water are P. Ballantine & Sons and the Celanese Corporation of America. These companies are keeping excellent records of pumpage and water levels and have done so for some time.

When the records that these two companies furnished were combined with other data available in the area, it was possible to prepare a diagram (figure 4) that shows some significiant trends of water levels and pumpage.

Probably the most striking features of figure 4 are the long-term trends toward greater pumpage and lower water levels. These two trends go together, of course, and from the studies made thus far it is not possible to say whether the lowering of water levels indicates a pumping rate in excess of natural recharge or merely the lowering necessary to induce flow into the area at the increasing rates. The apparent reversal of the downward trend of water levels in 1948 and 1949 is due to unusually good natural recharge coupled with artificial recharge that will be discussed later.

Almost equally striking are the seasonal fluctuations of water level and pumpage, which are related to each other and are due primarily to seasonal demands for water. Much of the water taken from the ground in the area is used for cooling and the demand is naturally greater in the summer. Furthermore, there is a seasonal demand, which is greatest in summer, for the products of some of the users of ground waters. This tends to accentuate the seasonal use of water. There is, of course, a greater recharge from precipitation during the winter when the demands of vegetation are at a minimum, but this probably accounts for only a few feet of the total fluctuation of water levels.

There is a notable similarity between the fluctuations of water level in the different wells shown in the diagram. This indicates that there is an over-all

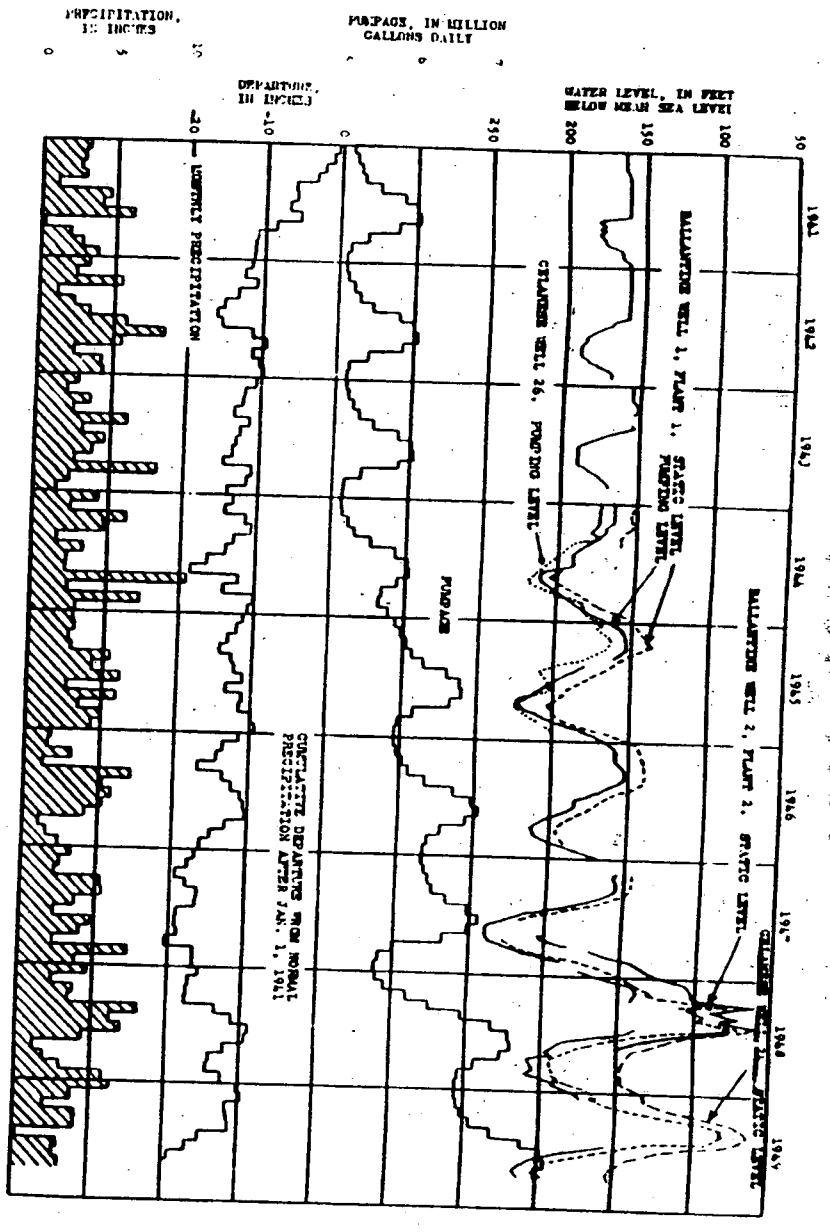

Figure 4.-Diagram showing fluctuations of pumpage and water levels in the eastern part of Newark, the monthly precipitation, and the cumulative departure from normal precipitation, 1941 to 1949.

connection between the various wells in the area and that the regional pumpage is of primary significance in determining the major fluctuations of water level. Minor differences are due, of course, to local conditions.

The wide range of seasonal fluctuations of water levels and the great depths to which they have been drawn are noteworthy. During recent years a change of one million gallons daily in the rate of pumping in this area has resulted in water-level fluctuations in the order of 60 to 75 feet. Furthermore, with a total pumpage of about seven million gallons daily the water levels have been lowered to 200 feet or more below mean sea level. In view of the fact that an early well in this vicinity flowed at an altitude of perhaps 10 feet above sea level, the current water levels represent actual drawdowns of more than 210 feet. The rate of lowering per million gallons pumped seems to be increasing and, indeed, this would be expected because of the decreasing capacity of the cracks with increasing depth. The figures strongly suggest that the rate of pumping in this vicinity cannot safely be increased very much more without serious consequences, unless the increase is accompanied by some measure of conservation such as artificial recharge.

The precipitation at Newark varies considerably from month to month, as indicated at the bottom of the diagram. The trend of the accumulated departure from normal precipitation is perhaps more useful in the study of ground-water trends because it indicates periods when increasing or decreasing amounts of water are available for underground storage or withdrawal. After the very dry period of 1941, the accumulated departure shows an essentially horizontal trend. This indicates that the long-term downward trend of water levels is not due to changes in precipitation. Some of the shorter trends may, however, have had some influence on the water levels. For example, the less severe drawdown in the summer of 1946 than in 1945 is probably due to the above-normal precipitation during the summer of 1946, as indicated by the rising trend of the departure line. Similarly, the sharp decline in the summer of 1947 is probably related to the declining trend of precipitation during that summer. It is obvious from a study of the diagram, however, that the fluctuations [illegible]mpage rather than those of precipitation are the [illegible]ipal causes of the water-level fluctuations.

Artificial recharge.- The graphs of water levels in figure 3 show a sharp and abrupt rise in March 1948 and again in February 1949, both without any corresponding decrease in pumpage. These apparent anomalies are caused by artificial recharging through wells, conducted experimentally by P. Ballantine & Sons with the cooperation of the Newark Water Department. On occasions during the winter when the temperature of the city water was as low as or lower than that of the ground water and when the city's reservoirs were overflowing, conditions were ideal for recharging. Water that would otherwise have gone to waste was stored underground and conserved for future use. Recharge was accomplished through several wells. In 1948 about 168 million gallons was stored in the ground in this way and in 1949 about 236 million gallons.

It had been hoped that the results of the pumping tests discussed earlier in this report would furnish accurate data for evaluating the effects of recharging. Unfortunately, it developed that conditions in this vicinity were unsuited to analysis in this way. However, the evaluation of the artificial recharge is not wholly dependent upon pumping tests.

As a result of the recharging, the water levels in the area as a whole were higher at the beginning of the season of heavy demand than they would otherwise have been. The greatest benefit occurred in the immediate area of the recharging, that is, in the Ballantine well field, but there were substantial gains at considerable distances. For example, during the recharging in 1949 a recorder was maintained on a well of the Celanese Corporation of America approximately half a mile from the center of recharging and water levels there rose sharply and promptly when the recharging was begun.

The water used for recharging probably did not drift very far away from the area in which it was introduced into the aquifer. Previous pumping had established a deep depression in the water table there and the effect of the recharging was to fill the depression partly. The improved water levels observed elsewhere occurred before water could possibly have moved through the aquifer from the point of recharge to [illegible] point of

observation. They represented a backing up of water that had previously been flowing into the Ballantine well field and that became available for withdrawal elsewhere when recharging began. The effect outside the Ballantine well field was exactly the same as if the rate of pumping at Ballantine's had been decreased by the amount that was recharged. And indeed the demand upon natural recharge was decreased by exactly that much. Much of the recharge water probably circulated directly to other wells in the Ballantine well field during the recharging. The remainder was almost certainly drawn into them soon after recharging ceased. Whatever benefits were derived from the higher quality and lower temperature of the recharge water were probably restricted entirely to the Ballantine well field. The gain in head and therefore in water stored in the ground extended to other nearby parts of the area.

Observations made during the recharging experiments indicated that the water levels in parts of the Ballantine well field may have risen above the top of the rock. This is not surprising in view of the limited capacity of the cracks in the rock. As soon as the water levels rose into the overlying glacial material the storage capacity was much greater. At no time did the head rise far enough to cause any loss of recharge water out of the system of aquifers. The highest water levels during the recharging were still more than 50 feet below mean sea level.

Chemical quality of the ground water

The chemical quality of the ground water from rock wells in the Newark area is shown by the analyses in table 1, on page 49. Analyses A and B are of water taken from wells in the western part of the area farthest removed from the Passaic River and Newark Bay. The water is hard, principally because of its calcium and magnesium content. It is too hard for boiler use, but is suitable for most other uses, particularly for cooling. Several tanneries using ground water in their operations report that the quality of the water has a "favorable" effect on their processes. One producer of carbonated water reported that the ground water

imparted a pleasing taste to his product. Where not contaminated by bacterial or other harmful impurities, the water is potable.

The general quality of water pumped from wells in the areas nearer the river and bay is shown in analyses C and D. This water is generally reported to be far more corrosive than the ground water in the areas farther from the river and bay, and where the chloride content is high the necessity of frequent replacement of ordinary bronze impellers on pumps has been reported. One user has apparently solved this problem by the use of impellers and pump bowls constructed of a high-nickel-content alloy. The highly mineralized water, of course, is generally not potable.

The high sulfate content of waters from some rock wells may be a function of the depth of the well. This may be explained by the fact that gypsum (calcium sulfate) has been observed in the cuttings taken from very deep wells. (See log of well 3, in appendix.) Gypsum has also been observed by the senior author in the cuttings from another deep well in Newark, and Meredith E. Johnson, New Jersey State Geologist, has observed gypsum in cuttings taken at 580 feet from a well drilled in the Brunswick formation near Westfield, New Jersey. In the cuttings from the bottom of the Celanese Corporation well, the gypsum occurred as large plates (1 1/2 by 1/2 by 1/8 inches) which had every appearance of having been the fillings of cracks. Presumably, therefore, gypsum, originally deposited in the cracks in the rock, has remained in the deeper cracks because it was not exposed to the circulation of meteoric waters.

Occasionally, wells drilled into the rocks of the Brunswick formation have yielded water of high mineral content upon completion. In such wells, it has sometimes been possible to lower the mineral content of the water by pumping the well heavily for a prolonged period. High mineral concentrations of this sort are probably caused by the ground water having been more or less stationary long enough to dissolve the mineral matter from the rock. Heavy pumping permits circulation of ground water and may induce a flow of water of lower mineral content toward the well. So far as is known, no instances of this sort have been reported in the Newark area.

Table 2.--Analyses of water from rock wells in the Newark area
(Results in parts per million)

Well	A	B	C	D	E	F
Color	0	0	0	0		
Total hardness as $CaCO_3$	300	282	380	2,870		
Dissolved solids	431	378	749	4,780		
Specific conductance, micromhos at 25^0 C.	669	614	1,220	6,960		
pH	7.2	7.6	7.5	7.3		
Silica (SiO_2)	22	20	18	31	34	
Iron (Fe)	.17	.13	1.1	.15		
Calcium (Ca)	105	67	111	865	340	426
Magnesium (Mg)	9.3	28	25	173	60	51
Sodium (Na)	19	16	87	447	18	48
Potassium (K)	1.8	2.7	2.8	7.0		
Carbonate (CO_3)	0	0	0	0		
Bicarbonate (HCO_3)	202	213	150	210	76	19
Sulfate (SO_4)	88	66	91	911	993	1,380
Chloride (Cl)	25	28	230	1,900	6.2	26
Fluoride (F)	.1	.1	.1	.0		
Nitrate (NO_3)	45	29	31	6.2		

Table 2.--Analyses of water from rock wells in the Newark area (continued)

A) From 310-foot well, Frick Bros. Creamery, Irvington, N. J.

Analysis by U.S.G.S., January 1948.

B) From 300-foot well, Hooton Chocolate Co., Newark, N. J.

Analysis by U.S.G.S., January 1948.

C) From 558-foot well, Kresge Dept. Store, Newark, N. J.

Analysis by U.S.G.S., January 1948.

D) From 805-foot well, P. Ballantine & Sons, well 1, plant 1, Newark, N. J.
Analysis by the U.S.G.S., January 1948.

E*) From 250-foot well, Celluloid Works, Newark, N. J. Analysis by P. Ballantine & Sons, 1879. (See Ann. Rept. New Jersey State Geologist for 1879, p. 127.)

F*) From 615-foot well, Lister Bros., Newark, N. J. Analysis by P. Ballantine & Sons, 1879. (See Ann. Rept. New Jersey State Geologist for 1879, p. 127.)

* Recalculated to p.p.m. by H. Herpers.

Reliable and detailed analyses of waters from wells pumping from the sand and gravel in the buried valley are not available at the present writing.

Salt-water intrusion

The infiltration of salt water into the body of fresh ground water is referred to as salt-water intrusion. In the Newark area it is believed to be caused principally by heavy pumping in areas adjacent to Newark Bay and the Passaic River. Heavy pumping lowers the general ground-water levels, creating a difference in head between the ground-water body and the nearby bay and river, inducing a flow of salt water into the water-bearing formations. Another factor that probably contributes to salt-water intrusion is the dredging of ship channels in the Passaic River and Newark Bay. As mentioned previously in the discussion of the hydrology of the Recent deposits, those deposits act as an imperfect barrier to the infiltration of salt water into the underlying materials. It is not improbable, therefore, that the deepening of ship channels in the river and bay has contributed to the breaking of the imperfect seal formed by the Recent (and, in some places, Pleistocene) deposits. In the areas of salt-water intrusion, the water in both the unconsolidated materials and the rocks is affected.

The attached map (figure 5) shows the distribution of the chloride content of the ground water in the area. Most of the data upon which the map was based were provided by the Newark City Chemist, through the courtesy of Dr. Charles V. Craster, Health Officer of the City of Newark. As almost all the analyses were made in 1942, when the City of Newark made a survey of certain qualities of the waters from wells in the city, the map presents a picture of the chloride content of the ground water at that time. Recent check analyses made in the investigation preceding this report, confirm generally the distribution of chloride shown. The curved lines represent points of equal chloride concentration.

Several areas of ground water with high chloride concentrations are shown, and all are in areas of relatively heavy pumpage. The first of these is along the Passaic River near the northern boundary of Newark, where there are several industries that use well water in processing. The pumpage here is not as heavy as in the other areas, and great amounts of river water have not been drawn into the ground-water body. Mention might here be made of the single well near the bank of the Passaic River, just south of the area, marked A on figure 5, the water from which contained 1,710 parts of chloride per million. This well pumps from a gravel bed about 45 feet below the surface which is probably in direct hydraulic connection with the river.

The second area of high chloride concentration is near the intersection of Harrison Avenue and McCarter Highway. Here, fairly heavy pumpage has induced an inflow of water from the river.

The third area, near the intersection of Raymond Boulevard and Broad Street, contains several wells that pump large amounts of water, principally for air-conditioning.

The fourth and largest area with high concentrations of chloride in well waters is in the eastern part of the Newark area and is bounded roughly by Harrison Avenue on the north; by Fourth Street, extended to Port Street on the west; by Port Street on the south; and by the Passaic River and Newark Bay on the east. The area contains many industries that require large amounts of ground water for cooling and processing. Heavy pumping, continued over a period of many years, has caused the depression of the upper surface of the ground-water body, which has, in turn, led to river-water intrusion on a large scale. That the present character of the water in this area is materially different from its original character can be seen by comparison of analyses D, E, and F (See table 2 on p. 38) Analysis D was made of water taken from a well of P. Ballantine & Sons in January 1948, whereas analyses E and F, made in 1879, are of water taken from wells not far from the Ballantine plant. Analyses E and F show that the ground water in this section originally had a chloride content comparable to that of water taken from wells in areas away from the river and bay.

About 4,000 feet northeast of the intersection of State Highway 25 and Port Street a great concentration of chloride was found in three wells belonging to a single company. Some of the differences in chloride content in this area may be due to differences in depth. The

highest concentration (2,700 p.p.m.) was encountered in a well 535 feet deep, whereas lower concentrations were found in nearby shallower wells. At the time the deep well was drilled, it was thought that the highly saline water might be caused by a pocket of stationary ground water, which had acquired its high salt content from the formation because of a lack of normal ground-water movement in the vicinity. On the basis of this assumption, the well was pumped steadily at a high rate of discharge for a few weeks with the idea of pumping out the pocket of highly mineralized water and inducing a flow of fresh water into the well. The results were inconclusive and the well was finally abandoned because of the unsatisfactory quality of the water.

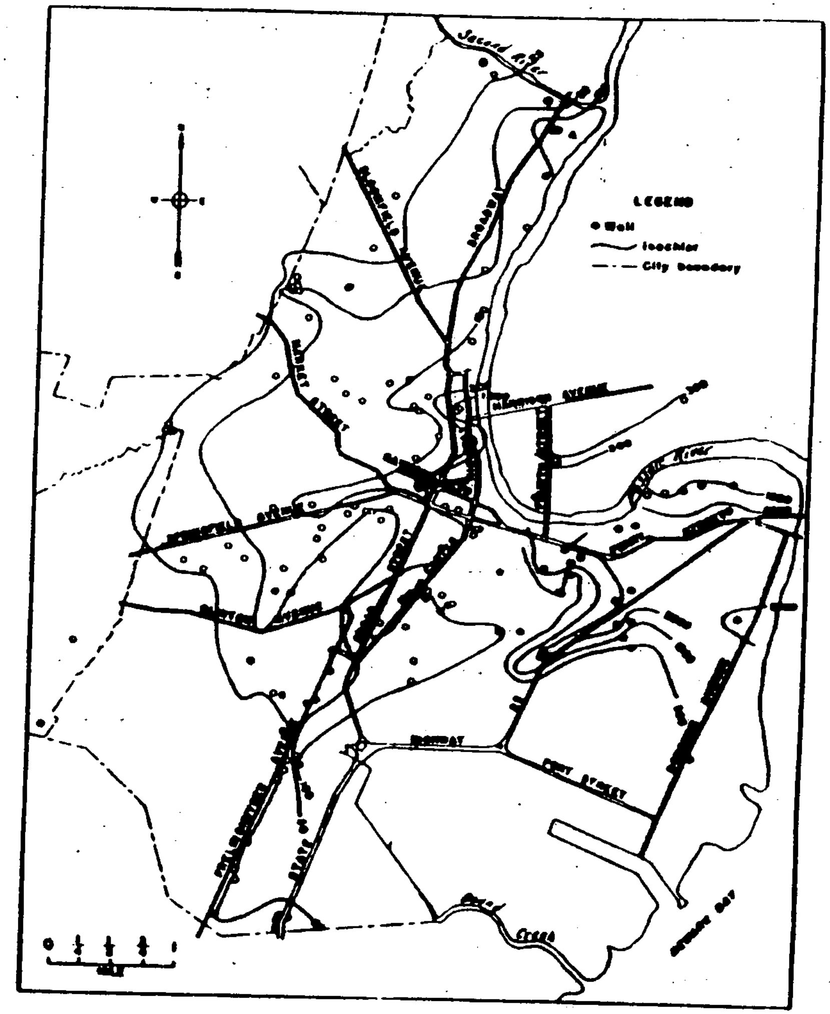

Figure 5.-Map showing chloride content of the ground water beneath Newark, N. J., and vicinity.

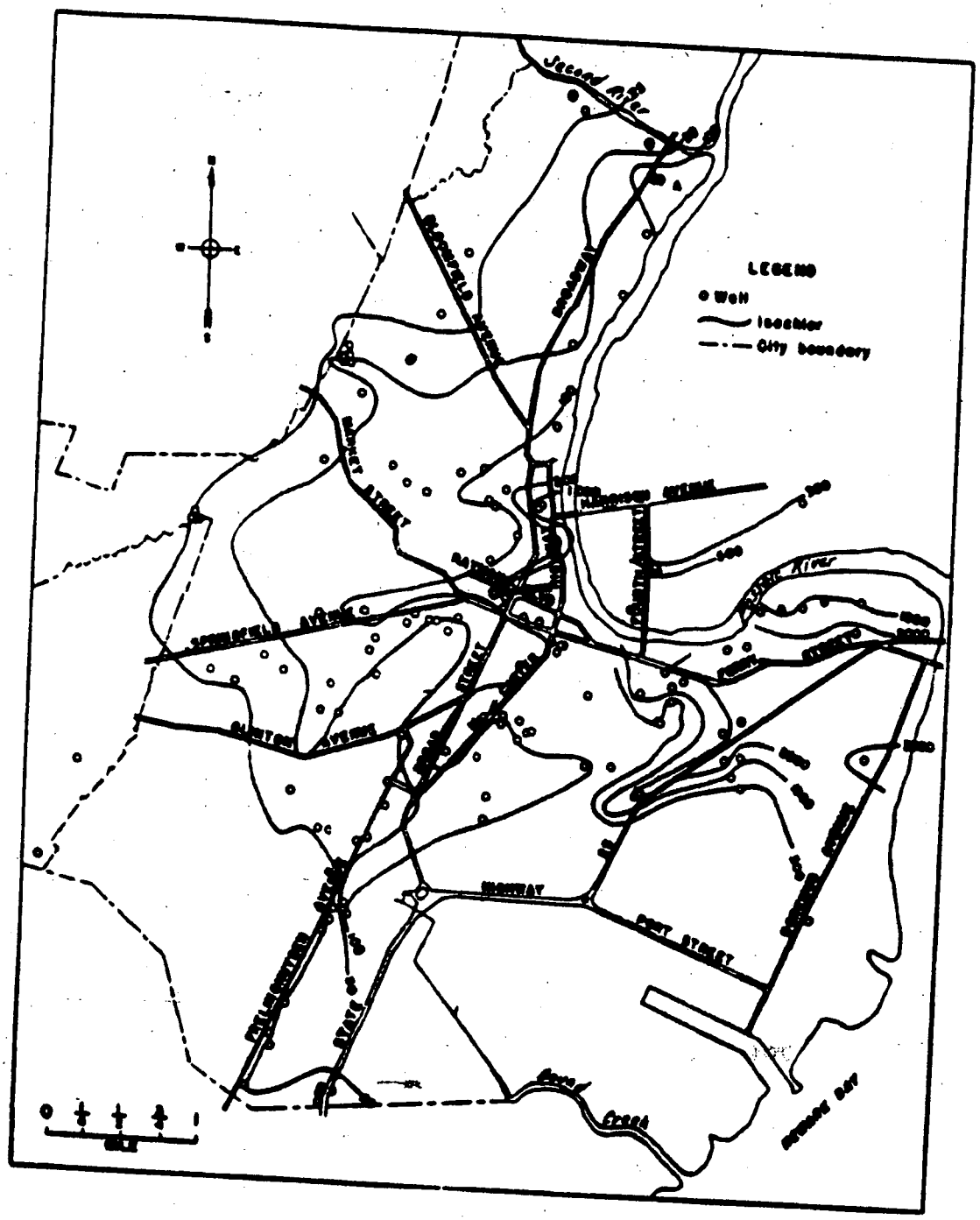

Figure 5.-Map showing chloride content of the ground water beneath Newark, N. J., and vicinity.

Temperature of the ground water

The average temperature of the ground water in the Newark area is approximately 55° F. The temperature of ground water, except as explained below, is largely a function of the depth of the aquifer from which it is drawn, and of the mean annual temperature of the air, which at Newark is 52.3° F. Water from very shallow wells will usually vary in temperature over the year. Water from somewhat deeper wells, however, has a temperature that, for all practical purposes, is equal to the mean annual temperature. The effect of the mean annual temperature on the temperature of ground water does not extend to great depths. It is known from numerous deep wells, mines, and test borings that the temperature of the earth's crust increases with depth. The rate at which the ground temperature increases with depth, known as the geothermal gradient, varies, depending upon many conditions, but generally an increase of 50 to 150 feet in depth will raise the temperature 1° F. Of course, in regions of active volcanism this rate of increase does not apply. In the Newark area the normal geothermal gradient is not known as all temperature measurements have been made at the point of discharge of the pumps. Each measurement, therefore, represents merely the temperature of the water issuing from the well, which is probably an average of the temperatures of water at all producing levels.

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CONCLUSIONS

The studies that preceded this report were not detailed or prolonged enough to arrive at definite answers to important questions that arise with regard to the safe yield of the aquifers in the Newark area. Only very tentative conclusions can be made at this time. Observations and studies should be continued over a period of years in order that the safe yield may be defined.

Continuing observations should be made of the pumping rates in every well in the area and of the water levels [illegible] an adequate number of observation wells so that the [illegible] and direction of flow in the aquifers and the amount of recharge to them may be defined. Periodic analyses of the water from representative wells throughout the area should be made in order to detect changes in its quality and especially to define the intrusion of salt water. Geologic information should be sought to extend our knowledge of the buried channel that passes through the area and of the materials that fill it. Whenever wells or other deep excavations are made, particular attention should be given to the nature of the material overlying the rock in order to establish its geologic and hydrologic characteristics more fully, and ultimately to define the best areas of recharge.

In many parts of the area conclusive data are not available, but it seems probable that there are localities where additional quantities of ground water may be obtained. It also seems probable that in some heavily pumped parts of the area the safe yield is being approached or has already been exceeded. For example, in the area around the plants of P. Ballantine & Sons and the Celanese Corporation of America, the water levels have been lowered to such an extent that it seems unlikely that any substantial additional quantity of water can be withdrawn from the ground safely or economically. The quality of the ground water in this area is already unfit for some uses.

The experiments with artificial recharge at the Ballantine plant during the last two years offer promise of great improvement in the ground-water conditions in some parts of the area if water is available for continuing such recharge. This is certainly sound conservation practice and should be expanded as much as possible. Whenever recharging is undertaken in the future, careful observations should be made of water levels and of the quality and quantity of water recharged and withdrawn, in order to evaluate the effects more closely and to trace the movement of the water.

2. Log of well 2 drilled for John Nieder, 247 Emmet Street, Newark, N. J., by Layne-New York Co. Log furnished by Mr. W. A. North of Layne-New York Co.

Depth	Thickness	Description	Correlation
0' - 3'	3'	Concrete	Recent
3' - 5'	2'	Cinders	Fill
5' - 15'	10'	Yellow clay	Recent ?
15' - 27'	12'	Fine red sand	Glacial drift
27' - 55'	28'	Red quicksand	"
55' - 80'	25'	Tough red clay	"
80' - 125'	45'	Soft red clay	"
125' - 190'	65'	Red sandy clay	"
190' - 210'	20'	Soft red clay	"
210' - 215'	5'	Hardpan	"
215' - 225'	10'	Sand and clay	"
225' - 408'	183'	Red rock	Triassic

APPENDIX I - SELECTED WELL LOGS

1. Log of well 2, drilled for Driver Harris Co., Harrison, N. J., by C. W. Lauman & Co. Log furnished by C. W. Lauman & Co.

Depth		Thickness	Description	Correlation
0'	- 21'6"	21'6"	Fill	Fill
21'6"	- 30'10"	9'4"	Sand and gravel	Glacial drift
30'10"	- 39'0"	8'2"	Coarse sand and gravel	"
39'0"	- 41'10"	2'10"	Streaks of hard red clay and gravel	"
41'10"	- 58'2"	16'4"	Red clay, fine sand and gravel	"
58'2"	- 62'2"	4'0"	Clay and gravel	"
62'2"	- 71'9"	9'7"	Hard red clay and broken rock	"
71'9"	- 82'0"	10'3"	Red clay and fine sand	"
82'0"	- 112'11"	30'11"	Red clay and rock	"
112'11"	- 135'0"	22'1"	Red clay	"
135'0"	- 141'0"	6'0"	Hard packed sand	"
141'0"	- 155'0"	14'0"	Red clay	"
155'0"	- 166'0"	11'0"	Clay, sand, and gravel	"
166'0"	- 173'3"	7'3"	Hardpan	"
173'3"	- 176'3"	3'0"	Clay, fine sand, and gravel	"
176'3"	- 187'3"	11'0"	Cemented sand and gravel	"
187'3"	- 192'3"	5'0"	Fine brown sand and clay	"
192'3"	- 212'10"	20'7"	Red clay	"
212'10"	- 222'6"	9'8"	Sand, gravel, and red clay	"
222'6"	- 225'6"	3'0"	Coarse sand and gravel	"
225'6"	- 231'6"	6'0"	Clay and gravel	"
231'6"	- 234'6"	3'0"	Coarse sand and small gravel	"
234'6"	- 240'0"	5'6"	Clay and sand	"
240'0"	- 243'0"	3'0"	Coarse brown sand, gravel, and some clay	"
243'0"	- 253'0"	10'0"	Medium coarse red sand and grit	"
253'0"	- 270'0"	17'0"	Red clay and gravel	"
270'0"	- 291'0"	21'0"	Hard clay, sand, and large gravel	"
291'0"	- 292'0"	1'0"	Medium coarse sand and large gravel	"
292'0"	- 337'0"	45'0"	Red Shale	Triassic

APPENDIX I - SELECTED WELL LOGS (CONT.)

3. Log of well 27 drilled for Celanese Corporation of America by Layne-New York Co. Compiled by H. Herpers from samples furnished by Wm. E. Helmstaedter, Mechanical Engineer, Celanese Corporation of America.

Depth	Thickness	Description	Correlation
2' - 27'	25'	Fine-grained red-brown sand	Glacial drift
27' - 32'	5'	Coarse gravel composed of red shale (to 1/2 in.)	"
32' - 71'	39'	Fine-grained red sandy clay	"
71' - 354'	283'	Red shale	Triassic
354' - 365'	11'	Red shale (softer than last)	"
365' - 377'	12'	Soft red shale (similar to last)	"
377' - 419'	42'	Fine-grained red sandstone	"
419' - 537'	118'	Red shale	"
537' - 580'	43'	Red shale (softer than last)	"
580' - 650'	70'	Very soft red shale	"
650' - 695'	45'	Soft red shale with some gypsum grains	"
695' - 725'	30'	Red shale. A few gypsum grains	"
725' - 730'	5'	Fine-grained red sandstone	"
730' - 787'	57'	Red shale with some gypsum grains	"
787' - 796'	9'	Fine-grained red shaly sandstone with gypsum grains	"
796' - 840'	44'	Red shale	"
840' - 856'	16'	Red sandy shale with large (1-1/2 in. x 1 in. x 1/8 in.) plates of gypsum, which appear to have been deposited in fractures in rock	"

APPENDIX I - SELECTED WELL LOGS (CONT.)

4. Log of test boring No. 19, made at crossing of Route 25 addition and Lehigh Valley R. R. yards by Giles Drilling Co. for State Highway Department. Compiled by H. Herpers from inspection of samples.

Depth	Description	Correlation
0' - 3'	Cinders	Fill
4' - 5'	Cinders and meadow muck	Fill and Recent
10' - 11'	Cinders, gray clay, and meadow muck	"
16' - 17'	Gray, slightly sandy clay	Recent
20' - 21'	Red and gray clay and medium sand	Recent (reworked glacial drift)
30' - 31'	Fine red silty sand	Glacial drift
40' - 41'	Red clay	"
50' - 51'	Red sandy clay	"
60' - 61'	Red sandy clay and red shale (top of rock)	Triassic
61' - 71'	Red shale (core)	"

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REFERENCE NO. 12

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I asked Drew if there is a current or pending sole source aquifer designation for Newark. He said there is no current or pending sole source aquifer designation for Newark.

Edmund Knyfd Jr. 5-15-89

ACTION ITEMS:

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P27/3
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THE HYDROGEOLOGY OF THE BURIED VALLEY AQUIFER SYSTEM

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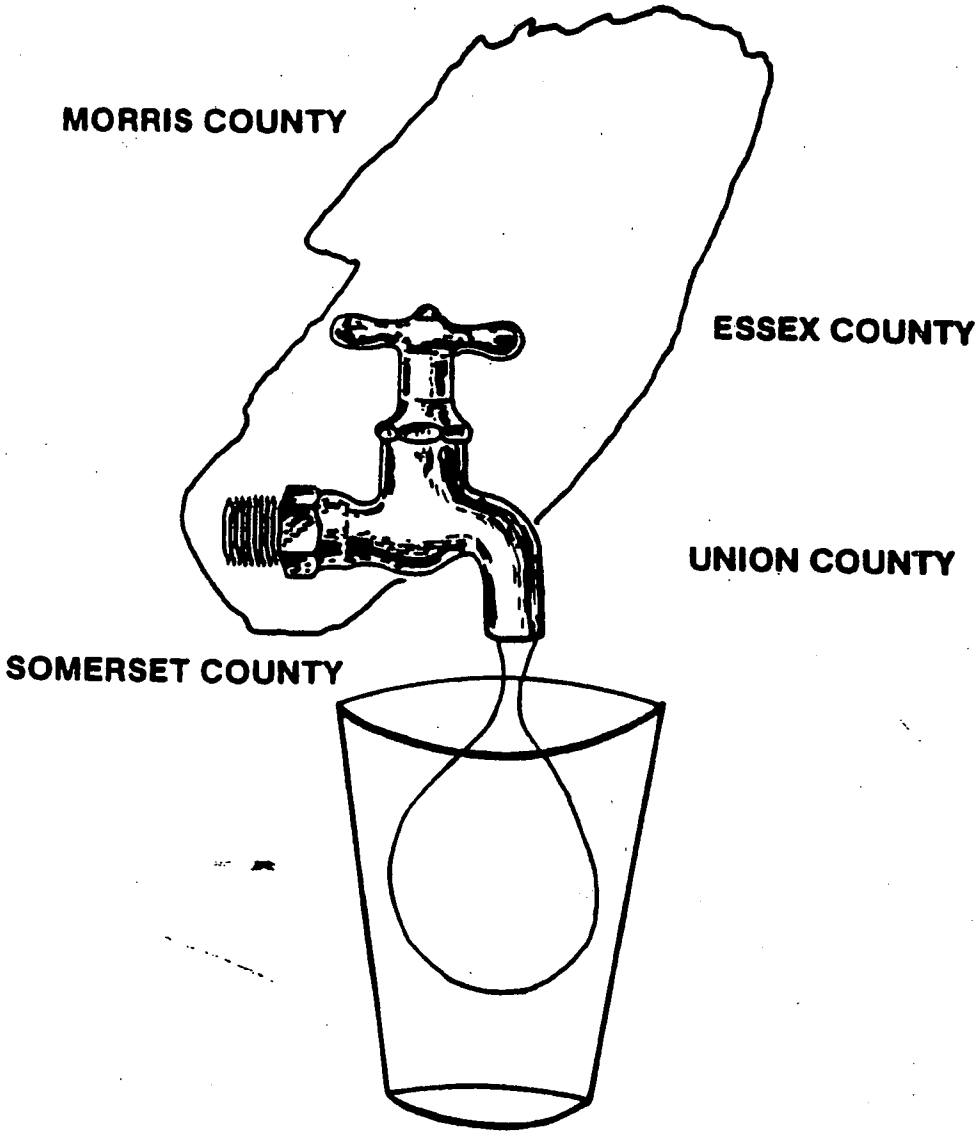

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size and number of the intersecting fractures. The yield of such rocks can vary considerably within a short distance, both horizontally and vertically. Because fractures are wider toward the surface due to weathering, a well in Precambrian rock is unlikely to supply much water below 300 feet. The 79 large-diameter public supply, industrial, and commercial wells operating in 1965 throughout Morris County yielded an approximate average of 121 gallons per minute (gpm), and the maximum and minimum yields were 400 and 5 gpm respectively. The larger amounts are usually associated with fault zones. (Gill and Vecchioli, 1965).

Water quality from Precambrian wells is generally good. Hardness ranges from soft (less than 50 ppm) to moderately hard (60-120 ppm); pH ranges from slightly acidic to slightly alkaline; and iron occurs in objectionable quantities in some areas (Gill and Vecchioli, 1965).

Newark Group: Brunswick Formation

The Brunswick Formation serves an an aquifer in the following communities: Chatham Borough, East Hanover Township, Florham Park Borough, Hanover Township, Harding Township, Lincoln Park Borough, Montville Township, Morris Township, Town of Morristown, Parsippany-Troy Hills Township, and Passaic Township in Morris County; Caldwell Borough, Fairfield Borough, Livingston Township, Millburn Township, North Caldwell Borough, Roseland Borough, West Caldwell Borough, and West Orange Town in Essex County; and Berkeley Heights Township, New Providence Borough, and Summit City in Union County (Gill and Vecchioli, 1965; Nichols, 1968a; Nemickas, 1976).

Table 2. Municipalities Entirely or Partially Within the Sole Source Aquifer Designated Area

Somerset County

Bernards Township
Bernardsville
Warren Township

Union County

Berkeley Heights
New Providence
Summit

Essex County

Caldwell
Essex Fells
Fairfield
Livingston
Millburn
North Caldwell
Roseland
West Caldwell

Morris County

Boonton
Boonton Township
Chatham
Chatham Township
Denville
Dover
East Hanover Township
Florham Park

Morris County (Cont'd)

Hanover Township
Harding Township
Jefferson Township
Kinnelon
Lincoln Park
Madison
Mendham
Mendham Township
Mine Hill
Montville Township
Morris Plains
Morristown
Morris Township
Mountain Lakes
Mt. Arlington
Passaic Township
Parsippany-Troy Hills Township
Randolph Township
Rockaway
Rockaway Township
Roxbury
Sparta
Victory Gardens
Wharton

Source: Federal Register Vol. 45, No. 91:30537.

REFERENCE NO. 14

A GERAGHTY & MILLER SPECIAL REPORT

The New Jersey Ground-Water Situation

by David W. Miller

August, 1979 (see telecon note - 02-880332-$I ~~02-5865-01~~ 5/12/88

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THE AQUIFER SYSTEMS

For a general discussion of ground-water conditions in New Jersey, the state can be divided into three broad geographic areas based on the distinctive rock types that occur in each (Figure 1). The Coastal Plain physiographic province is the largest area, and encompasses more than 5,000 square miles in the southern portion of the state. The geology of the Coastal Plain is characterized by a southeasterly dipping and thickening sequence of unconsolidated sediments.

The Triassic Lowlands are underlain by thousands of feet of red shale, with some sandstone, siltstone, conglomerate, basalt and diabase. The geologic formations in the Highlands region consist of hard crystalline rocks such as the Precambrian gneisses and quartzites; carbonates, such as the Kittatinny limestone; and relatively dense sandstones, conglomerates and shales, such as the Martinsburg.

Bedrock in both the Triassic Lowlands and the Highlands is overlain by unconsolidated deposits of glacial origin. In places, these surficial deposits are thick and permeable, and are commonly in direct hydraulic connection with the underlying bedrock and adjacent streams, rivers, and lakes.

THE TRIASSIC LOWLANDS AND THE HIGHLANDS REGION OF NORTHERN NEW JERSEY

The geology and hydrology of northern New Jersey are considerably more complex than the Coastal Plain region. To simplify, it has been divided into two broad areas, the Triassic Lowlands and the Highlands Region (Figure 1). Unlike the Coastal Plain, where the aquifers consist of extensive beds of unconsolidated deposits, the primary water-bearing units in northern New Jersey are sedimentary and crystalline rocks (Figure 11). These vary considerably in their ability to yield water, depending on rock type and location. Both regions are also heavily dependent upon unconsolidated glacial deposits for water supply and where these occur in buried, eroded rock channels and are thick and permeable, the glacial sediments represent the most important source of ground water in both the Triassic Lowlands and the Highlands. Figure 12 shows the general major deposits of glacial origin that may have some ground-water potential.

Geology and Hydrology

Triassic Sediments: The Triassic Lowlands are almost entirely underlain by sedimentary Brunswick Shale. Although its primary permeability is low, appreciable amounts of water are found in joints and fractures. However, unless a significant number of these joints and fractures are penetrated by a well, yields can be relatively small. The direction of highest permeability and of the greatest movement of water in response to pumping tends to parallel the strike of the beds, generally southwest to northeast.

In general, the principal water-bearing zone of the Triassic rocks ranges from less than 200 feet to 600 feet in depth. The median depth of industrial and municipal supply wells in Bergen County is 260 feet. High-yield wells tapping this aquifer in Essex County are between 300 and 400 feet deep. There appears to be a direct relationship between well yield and thickness of overlying unconsolidated glacial deposits. Wells generally produce more where the overlying deposits are relatively thick, stratified, and coarse-grained. These surface deposits are often in direct hydraulic connection with the bedrock, and act as a source of recharge because of their greater capacity to receive and store precipitation (Figure 12).

A number of high capacity wells tap the Triassic rocks. In Essex County, yields of 35 public supply, industrial, and commercial wells range from 35 to 820 gpm (gallons per minute) and average 364 gpm. Wells over 300 feet deep and larger than 8 inches in diameter have a median yield of 230 gpm in Passaic County. However, the ability to develop high capacity wells is not uniform throughout the region. Many wells drilled during exploration programs are never equipped as production wells because of poor yields.

Igneous rocks associated with the sedimentary formations, principally diabase and basalts, are highly resistant to erosion and form the ridges of the Watchung Mountains and the Palisades. They are poor aquifers, tapped primarily for domestic purposes by wells yielding 5 gpm or less.

north-south band, east of the Passaic River, and near the Saddle River. Most of the southern and central part of the county is sewered: only public supply pumpage in the extreme northern section of the county is not used consumptively. The percentage of industrial pumpage used consumptively is unknown, but many of the industrial plants along the Passaic and Saddle Rivers discharge to the rivers, and the water is essentially lost from the ground-water system. There are indications of areawide water-level declines in southern Bergen County from overpumping the Triassic shales.

The opportunity for further development of ground water depends to a great degree on the future industrial pumpage, and the ability to develop surface water and ground water conjunctively in basins containing significant glacial deposits. The bedrock aquifer already appears to be overstressed in areas of concentrated pumpage.

Essex County: Ground water accounts for about 28 percent of the total water used in the county. More than 80 percent of the 35 mgd pumped for public supply is obtained from stratified drift deposits, mostly in the western portion of the county. This heavy pumpage and urbanization in the Livingston-Florham Park-Millburn area have resulted in severe water-level declines in both the unconsolidated and sandstone aquifers, which function as a single hydraulic unit in the area (Figure 12).

Heavy pumpage from the Triassic sediments in the Newark area has exceeded the average recharge to the system, and water levels have been declining for years with serious salt-water intrusion from Newark Bay and the Passaic River. Newark and the western valley-fill aquifer areas are of

special concern. and severe water-level declines will continue unless effective water management plans are implemented.

Hudson County: Water quality is a major constraint on ground-water development in Hudson County. Ground-water quality in the unconsolidated deposits in the Hackensack Meadows is greatly influenced by the poor quality of the Hackensack River. and by tidal flooding of the meadows. Heavy pumping at Hackensack and near North Bergen has induced poor quality water from the Hackensack River into the sand and gravel aquifers. High chloride water in the lower Hackensack River is unsuitable for most municipal and industrial processes except cooling.

Hunterdon County: Northwestern portions of Hunterdon County rely heavily on surface water from the Musconetcong and Delaware Rivers, while ground water supplies most of the remaining area. About 25 percent of all the public utilities obtain their supplies from surface-water bodies, 40 percent rely on ground water, and the remainder use a combination of both.

Public supply and industrial pumpage is distributed unevenly throughout Hunterdon County. The greatest local consumption occurs in the southeastern portion, principally from rock aquifers. Glacial drift deposits along the Delaware River have supplied about 10 percent of Hunterdon's groundwater demands, and could supply considerably more in the future.

Mercer County: Approximately 30 mgd of Mercer County's total usage is surface water, derived principally from the Delaware River drainage basin in the western half of the county which includes about 80 percent of its

REFERENCE NO. 15

Uncontrolled Hazardous Waste Site Ranking System

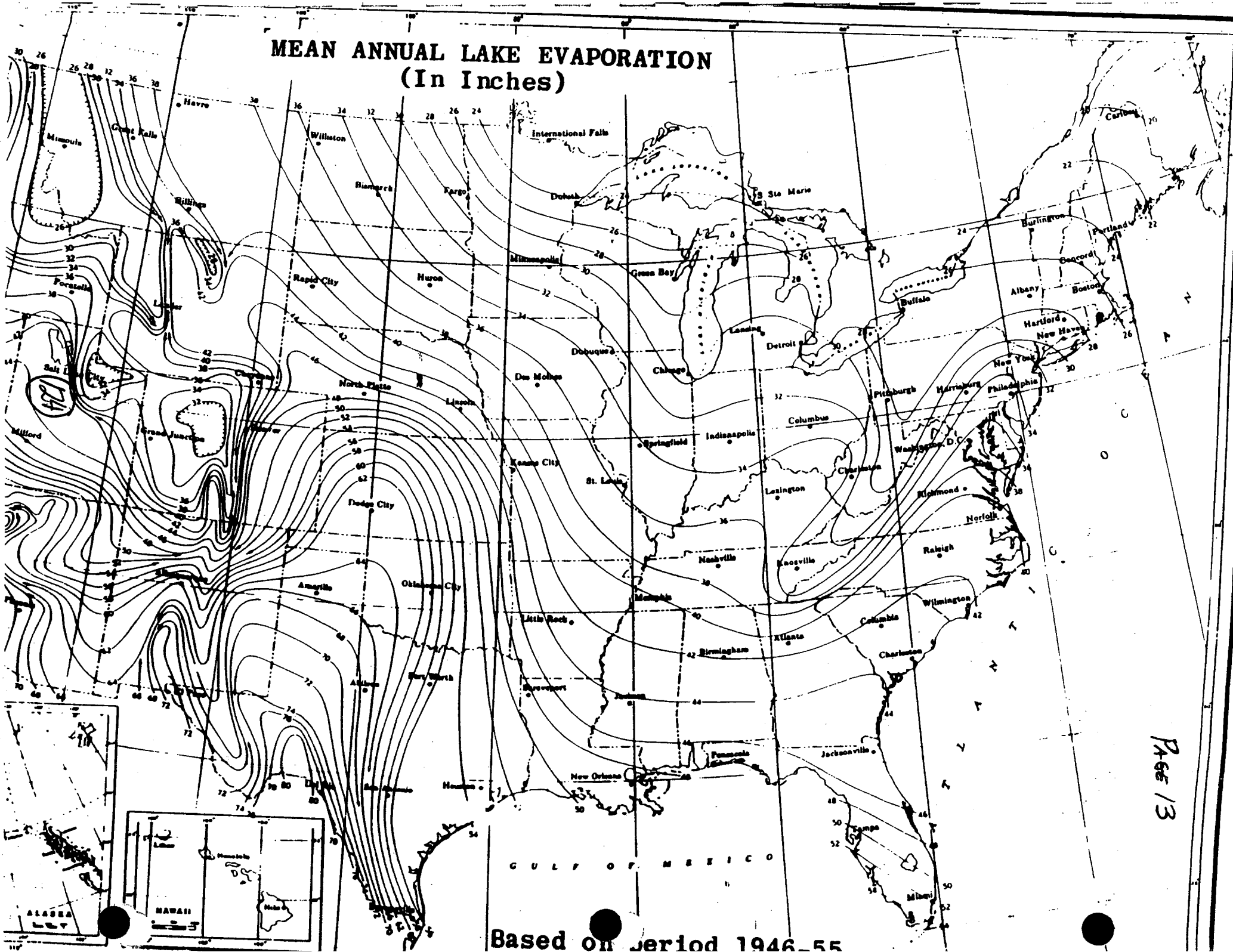
A Users Manual
(HW-10)

Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984

MEAN ANNUAL LAKE EVAPORATION
(In Inches)



Based on period 1946-55

PAGE 13

NORMAL ANNUAL TOTAL PRECIPITATION (Inches)

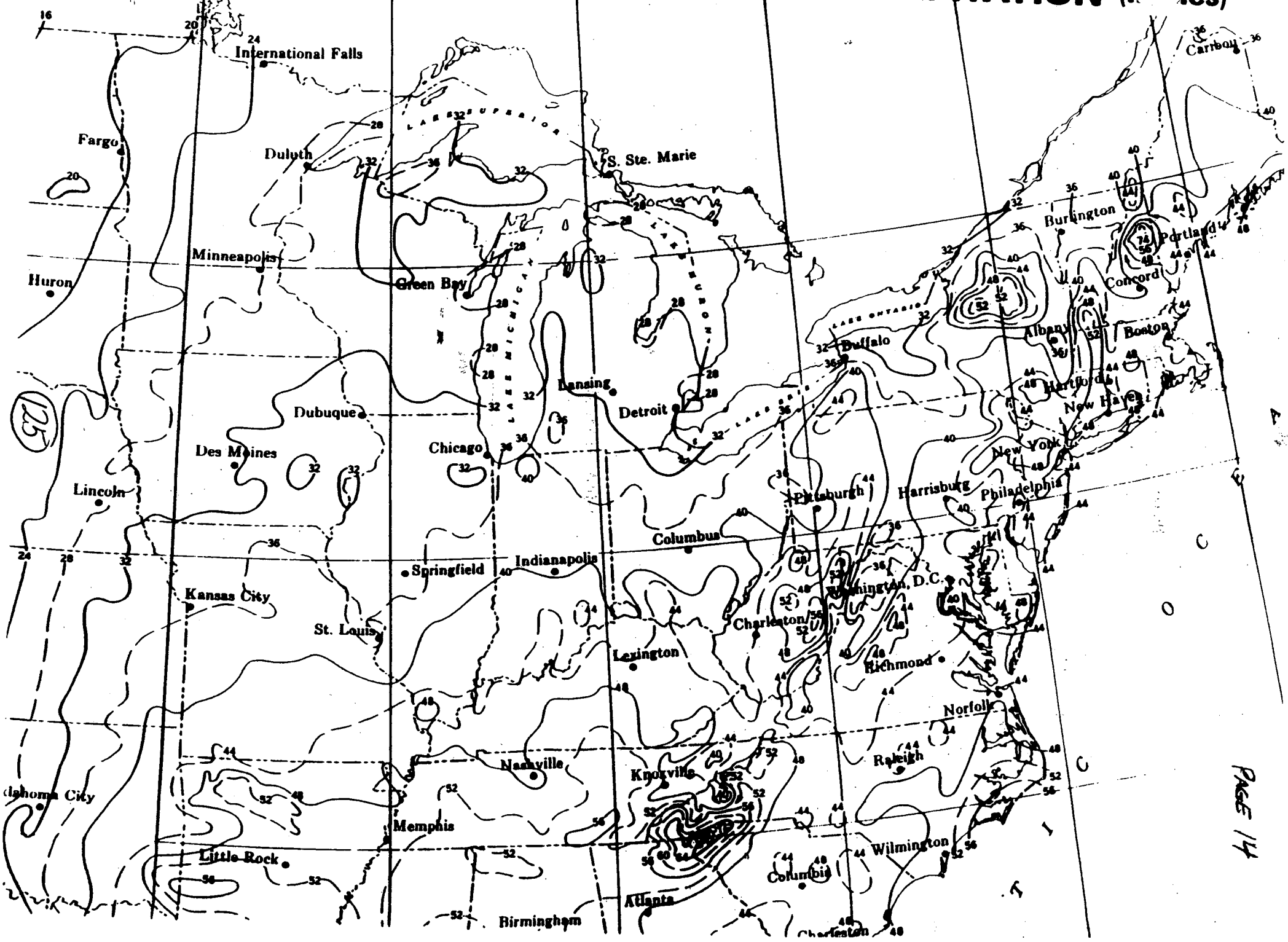


TABLE 2

PERMEABILITY OF GEOLOGIC MATERIALS*

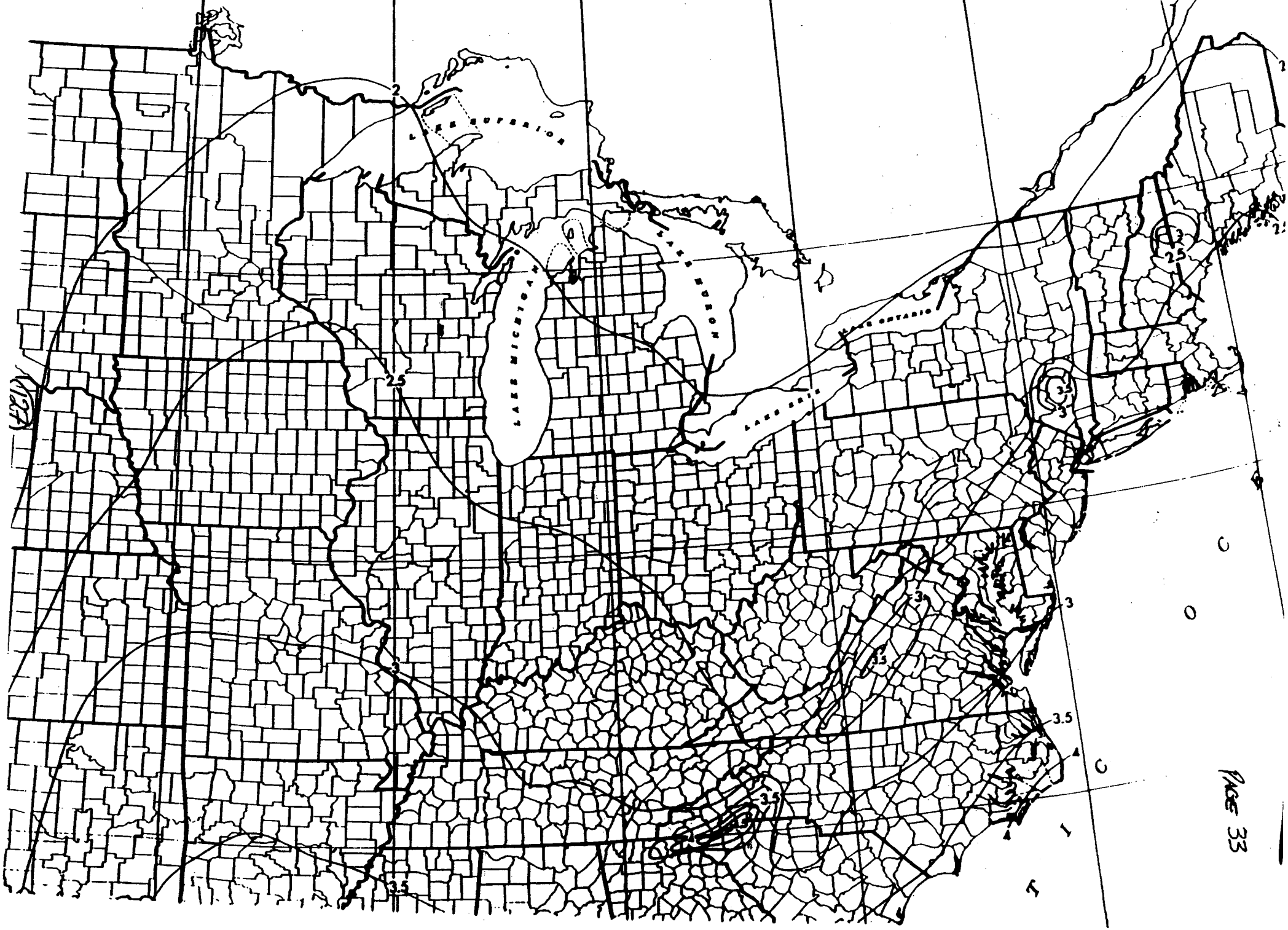
Type of Material	Approximate Range of Hydraulic Conductivity	Assigned Value
Clay, compact till, shale; unfractured metamorphic and igneous rocks	$<10^{-7}$ cm/sec	0
Silt, loess, silty clays, silty loams, clay loams; less permeable limestone, dolomites, and sandstone; moderately permeable till	$10^{-5} - 10^{-7}$ cm/sec	1
Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestone, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till	$10^{-3} - 10^{-5}$ cm/sec	2
Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestone and dolomite	$>10^{-3}$ cm/sec	3

*Derived from:

Davis, S. N., Porosity and Permeability of Natural Materials in Flow-Through Porous Media, R.J.M. DeWest ed., Academic Press, New York, 1969

Freeze, R.A. and J.A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979

1 YEAR 24-HOUR RAINFALL (inches)



REFERENCE NO. 16

...ORATION AND SUBSIDIARIES

TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8501-01	01-20-88	1400

DISTRIBUTION:

SCP

BETWEEN: Mr Melito

OF: Essex Co. Dept of Public Work - Engineer

PHONE: (201) 2268500

AND: Richard Pagano

DISCUSSION:

Mr Melito informed me that to his knowledge there are no drinking water wells in the whole city of Newark.

ACTION ITEMS:

NUS 067 REVISED 0686

REFERENCE NO. 17

TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8810-07	2-27-89	1035

DISTRIBUTION:

file: Zamelsky Scrap

BETWEEN:	OF:	PHONE:
Ms. James	Newark City Water Dept.	(201) 256-4965

AND: David Heim (NUS)

DISCUSSION:

Most of the City of Newark draws its drinking water from the Pequannock watershed, which is a system of five reservoirs. However, the south side of Newark, where Zamelsky is located, is served by the Wanaque Reservoir. All of these reservoirs are located in northern Passaic County.

David Heim 2-27-89

ACTION ITEMS:

NUS 087 REVISED 0686

REFERENCE NO. 18

NUS CORPORATION

TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8904-27	5-4-89	1350

DISTRIBUTION:

TO FILE - CELLOFILM CORP.

BETWEEN:	OF:	PHONE:
HAROLD CARSCADDEN PLANT TECHNICIAN	PASSAIC VALLEY SEWERAGE COMM.	(201) 344-1800

AND:

EDMUND KNYFD JR. (NUS)

DISCUSSION:

Harold indicated to me that sewer water is treated at the treatment plant and then discharged a couple of miles out into Newark Bay.

Edmund Knyfd.
5-4-89

ACTION ITEMS:

NUS 067 REVISED 0581

REFERENCE NO. 19

REFERENCE NO. 20

Surface Water Classifications

Surface Water Quality Standards
N.J.A.C. 7:9-4

Index D-
Surface Water Classifications of the Passaic, Hackensack and N.Y. Harbor Complex Basin

July 1985

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State of New Jersey Department of Environmental Protection/Division of Water Resources

COOLEY BROOK	
(W. Milford) - Entire length, except segments described below	FW2-TP(C1)
(Hewitt) - Segments of the brook and all tributaries located entirely within Hewitt State Forest	FW1 [tp]
CORYS BROOK (Warren) - Entire length	FW2-NT
CRESSKILL BROOK	
(Alpine) - Source to Duck Pond Rd. bridge, Demarest	FW2-TP(C1)
(Demarest) - Duck Pond Rd. bridge to Tenakill Brook	FW2-NT
CUPSAW BROOK	
(Skylands) - Source to Cupsaw Lake dam, except segment described below	FW2-NT
(Skylands) - That segment of Cupsaw Brook above the dam and within the boundaries of Ringwood State Park	FW2-NT(C1)
(Skylands) - Cupsaw Lake dam to mouth	FW2-TM
DEAD RIVER (Liberty Corners) - Entire length	FW2-NT
DEN BROOK (Denville) - Entire length	FW2-NT
DUCK POND (Ringwood)	FW2-NT(C1)
ELIZABETH RIVER	
(Elizabeth) - Source to Broad St. bridge, Elizabeth and all freshwater tributaries	FW2-NT
(Elizabeth) - Broad St. bridge to mouth	SE3
FOX BROOK (Mahwah) - Entire length	FW2-NT
GLASMERE POND (Ringwood)	FW2-NT(C1)
GOFFLE BROOK (Hawthorne) - Entire length	FW2-NT
GRANNIS BROOK (Morris Plains) - Entire length	FW2-NT
GREAT BROOK	
(Chatham) - Entire length, except segment described below	FW2-NT
(Great Swamp) - Segment within the boundaries of the Great Swamp National Wildlife Refuge	FW2-NT(C1)
GREEN BROOK	
(W. Milford) - Entire length, except those segments described below	FW2-TP(C1)
(Hewitt) - Those segments located entirely within the Hewitt State Forest boundaries	FW1 [tp]
GREEN POND (Rockaway)	FW2-TM
GREEN POND BROOK (Picatinny Arsenal) - Green Pond outlet to Rockaway River	FW2-NT
GREENWOOD LAKE (W. Milford)	FW2-TM
* HACKENSACK RIVER	
(Oradell) - Source to Oradell dam	FW2-NT
(Oradell) - Main stem and saline tributaries from Oradell dam to the confluence with Overpeck Creek	SE1
(Little Ferry) - Main stem and saline tributaries from Overpeck Creek to confluence with Berrys Creek	SE2
(Secaucus) - Main stem from Berrys Creek to Route 1 & 9 crossing	SE2
(Kearny Point) - Main stem downstream from Route 1 & 9 crossing	SE3

TRIBUTARIES	
(Oradell) - Tributaries joining the main stem between Oradell dam and the confluence with Overpeck Creek	FW2-NT/SE1
(Little Ferry) - Tributaries joining the main stem downstream of Overpeck Creek	FW2-NT/SE2
HANKS POND (Clinton) - Pond and all tributaries	FW1
HARMONY BROOK (Brookside) - Entire length	FW2-TP(C1)
HARRISONS BROOK (Bernards) - Entire length	FW2-NT
HAVEMEYER BROOK (Mahwah) - Entire length	FW2-TP(C1)
HEWITT BROOK (W. Milford) - Entire length	FW2-TP(C1)
HIBERNIA BROOK	
(Hibernia) - Entire length, except tributary described separately below	FW2-TM
(Rockaway) - Entire length of tributary at Rockaway	FW2-TP(C1)
HIGH MOUNTAIN BROOK (Ringwood) - Source to, but not including, Skyline Lake	FW2-TP(C1)
HOHOKUS BROOK (Hohokus) - Entire length	FW2-NT/SE2
HUDSON RIVER	
(Rockleigh) - River and saline portions of New Jersey tributaries from the N.J.-N.Y. boundary line in the north to its confluence with the Harlem River, N.Y.	SE1
(Englewood Cliffs) - River and saline portions of New Jersey tributaries from the confluence with the Harlem River, N.Y. to a north-south line connecting Constable Hook (Bayonne) to St. George (Staten Island, N.Y.)	SE2
TRIBUTARIES	
(Rockleigh) - Freshwater portions of tributaries to the Hudson River in New Jersey	FW2-NT
INDIAN GROVE BROOK (Somersetin) - Entire length	FW2-TM
JACKSON BROOK	
(Mine Hill) - Source to the boundary of Hurd Park, Dover	FW2-TP(C1)
(Dover) - Hurd Park to Rockaway River	FW2-NT
JENNINGS CREEK (W. Milford) - State line to Wanaque River	FW2-TP(C1)
JERSEY CITY RESERVOIR (Boonton)	FW2-TM
KANOUSE BROOK (Newfoundland) - Entire length	FW2-TP(C1)
KIKEOUT BROOK (Butler) - Entire length	FW2-NT
KILL VAN KULL (Bayonne) - Westerly from a north-south line connecting Constable Hook (Bayonne) to St. George (Staten Island, N.Y.)	SE3
LAKE RICKONDA OUTLET STREAM (Monks) - That segment of the outlet stream from Lake Rickonda within Ringwood State Park	FW2-TM(C1)
LAKE STOCKHOLM BROOK	
(Stockholm) - Entire length, except tributaries described separately below	FW2-TM
(Stockholm) - Westerly tributary located entirely within the boundaries of the Newark Watershed	FW1 [tm]

(Stockholm) - Brook between Hamburg Turnpike and Williamsville-Stockholm Rd. to its confluence with Lake Stockholm Brook, north of Rt. 23	FW1 [tm]
LITTLE POND BROOK (Oakland) - Entire length	FW2-TP(C1)
LOANTAKA BROOK	
(Green Village) - Entire length, except segment described below	FW2-NT
(Great Swamp) - Brook and all tributaries within the boundaries of Great Swamp National Wildlife Refuge	FW2-NT(C1)
LUD-DAY BROOK	
(Camp Garfield) - Source to confluence with a tributary from Camp Garfield	FW1
MACOPIN RIVER	
(Newfoundland) - Source to Echo Lake dam	FW2-NT
(Newfoundland) - Echo Lake dam to Pequannock River	FW2-TM
MEADOW BROOK (Wanaque) - Skyline Lake to Wanaque River	FW2-NT
MILL BROOK	
(Randolph) - Source to Rt. 10 bridge	FW2-TP(C1)
(Randolph) - Rt. 10 bridge to Rockaway River	FW2-NT
MORSES CREEK - Entire length	FW2-NT/SE3
MOSSMAN'S BROOK - See CLINTON BROOK	
MT. TABOR BROOK (Morris Plains) - Entire length	FW2-NT
* NEWARK BAY (Newark) - North of an east-west line connecting Elizabethport with Bergen Pt., Bayonne up to the mouths of the Passaic and Hackensack Rivers	SE3
NOSENZO POND (Upper Macopin)	FW2-NT(C1)
OAK RIDGE RESERVOIR (Oak Ridge)	FW2-TM
OAK RIDGE RESERVOIR (Oak Ridge) - Northwestern tributary to Reservoir	FW1 [tm]
OVERPECK CREEK (Palisades Park) - Entire length	FW2-NT/SE2
PECKMAN RIVER (Verona) - Entire length	FW2-NT
PACACK BROOK	
(Stockholm) - Source to Pequannock River, excluding Canistear Reservoir, except segments described separately below	FW2-NT
(Canistear) - Brook and tributaries upstream of Canistear Reservoir located entirely within the boundaries of the Newark Watershed	FW1
* PASSAIC RIVER	
(Mendham) - Source to Rt. 202 bridge (Van Doren's Mill), except tributaries described separately below	FW2-TM
(Paterson) - Rt. 202 bridge to Dundee Lake dam	FW2-NT
(Little Falls) - Dundee Lake dam to confluence with Second River	FW2-NT/SE2
(Newark) - Confluence with Second River to mouth	SE3

REFERENCE NO. 21

SURFACE WATER QUALITY STANDARDS

N.J.A.C. 7:9-4.1 et seq.

May 1985

(141)

specified test conditions, based on the results of an acute bioassay.

"Limiting nutrient" means a nutrient whose absence or scarcity exerts a restraining influence upon an aquatic biological population.

"MA7CD10" means the minimum average 7 consecutive day flow with a statistical recurrence interval of 10 years.

"Measurable changes" means changes measured or determined by a biological, chemical, physical analytical method, conducted in accordance with USEPA approved methods as identified in 40 C.F.R. 136 or other analytical methods (for example, mathematical models, ecological indices, etc.) approved by the Department, that might adversely impact a water use (including, but not limited to aesthetics).

"Mixing zones" means localized areas of surface waters, as may be designated by the Department, into which wastewater effluents may be discharged for the purpose of mixing, dispersing, or dissipating such effluents without creating nuisances or hazardous conditions, or violating the provisions of this subchapter.

"Natural flow" means the water flow that would exist in a waterway without the addition of flow of artificial origin.

"Natural water quality" means the water quality that would exist in a waterway or a waterbody without the addition of water or waterborne substances from artificial origin.

"NJPDES" means New Jersey Pollutant Discharge Elimination System.

"NOEC" means the "no observable effect concentration", which is the highest concentration of a toxic substance that has no adverse effect(s) on survival, growth, or reproduction of species based upon the results of chronic toxicity testing.

"Nondegradation waters" means those waters set aside for posterity because of their clarity, color, scenic setting, other characteristic of aesthetic value, unique ecological significance, exceptional recreational significance, or exceptional water supply significance. These waters include all waters designated as FW1 in this subchapter.

"Nonpersistent" means degrading relatively quickly, generally having a half-life of less than 96 hours.

"Nontrout waters" means fresh waters that have not been designated in this subchapter as trout production or trout maintenance. These waters are generally not suitable for trout because of their physical, chemical, or biological

characteristics, but are suitable for a wide variety of other fish species.

"NPDES" means National Pollutant Discharge Elimination System.

"NT" means nontrout waters.

"Nutrient" means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the growth and development of organisms.

"Outstanding National Resource Waters" means high quality waters that constitute an outstanding national resource (for example, waters of National/State Parks and Wildlife Refuges and waters of exceptional recreational or ecological significance) as designated in Index G incorporated into this subchapter.

"Persistent" means relatively resistant to degradation, generally having a half life of over 96 hours.

"Pinelands waters" means all waters within the boundaries of the Pineland Area, except those waters designated as FW1 in this subchapter, as established in the Pinelands Protection Act N.J.S.A. 13:18A-1 et seq. and shown on Plate 1 of the "Comprehensive Management Plan" adopted by the New Jersey Pinelands Commission in November 1980.

"PL" means the general surface water classification applied to Pinelands Waters.

"Primary contact recreation" means recreational activities that involve significant ingestion risks and includes, but is not limited to, wading, swimming, diving, surfing, and water skiing.

"Public hearing" means a legislative type hearing before a representative or representatives of the Department providing the opportunity for public comment, but does not include cross-examination.

"River mile" means the distance, measured in statute miles, between two locations on a stream, with the first location designated as mile zero. Mile zero for the Delaware River is located at the intersection of the centerline of the navigation channel and a line between the Cape May Light, New Jersey, and the tip of Cape Henlopen, Delaware.

"Saline waters" means waters having salinities generally greater than 3.5 parts per thousand at mean high tide.

"SC" means the general surface water classification applied to coastal saline waters.

"SE" means the general surface water classification applied to saline waters of estuaries.

(c) In all FW2 waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;

2. Primary and secondary contact recreation;

3. Industrial and agricultural water supply;

4. Public potable water supply after such treatment as required by law or regulation; and

5. Any other reasonable uses.

(d) In all SE1 waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;

2. Maintenance, migration and propagation of the natural and established biota;

3. Primary and secondary contact recreation; and

4. Any other reasonable uses.

(e) In all SE2 waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;

2. Migration of diadromous fish;

3. Maintenance of wildlife;

4. Secondary contact recreation; and

5. Any other reasonable uses.

(f) In all SE3 waters the designated uses are:

1. Secondary contact recreation;

2. Maintenance and migration of fish populations;

3. Migration of diadromous fish;

4. Maintenance of wildlife; and

5. Any other reasonable uses.

(g) In all SC waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;

REFERENCE NO. 22

Endangered & Threatened Wildlife and Plants

RECEIVED
MAY 2 REC'D
NUS CORPORATION
REGION II
SENT TO

APRIL 10, 1987

50 CFR 17.11 & 17.12

(146)

Title 50—Wildlife and Fisheries

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

* * * * * * *

Subpart B—Lists

Source: 48 FR 34182, July 27, 1983, unless otherwise noted.

§ 17.11 Endangered and threatened wildlife.

(a) The list in this section contains the names of all species of wildlife which have been determined by the Services to be Endangered or Threatened. It also contains the names of species of wildlife treated as Endangered or Threatened because they are sufficiently similar in appearance to Endangered or Threatened species (see § 17.50 *et seq.*).

(b) The columns entitled "Common Name," "Scientific Name," and "Vertebrate Population Where Endangered or Threatened" define the species of wildlife within the meaning of the Act. Thus, differently classified geographic populations of the same vertebrate subspecies or species shall be identified by their differing geographic boundaries, even though the other two columns are identical. The term "Entire" means that all populations throughout the present range of a vertebrate species are listed. Although common names are included, they cannot be relied upon for identification of any specimen, since they may vary greatly in local usage. The Services shall use the most recently accepted scientific name. In cases in which confusion might arise, a synonym(s) will be provided in parentheses. The Services shall rely to the extent practicable on the *International Code of Zoological Nomenclature.*

(c) In the "Status" column the following symbols are used: "E" for Endangered, "T" for Threatened, and "E [or T] (S/A)" for similarity of appearance species.

(d) The other data in the list are nonregulatory in nature and are provided for the information of the reader. In the annual revision and compilation of this title, the following information may be amended without public notice: the spelling of species' names, historical range, footnotes, references to certain other applicable portions of this title, synonyms, and more current names. In any of these revised entries, neither the species, as defined in paragraph (b) of this section, nor its status may be changed without following the procedures of Part 424 of this title.

(e) The "historic range" indicates the known general distribution of the species or subspecies as reported in the current scientific literature. The present distribution may be greatly reduced from this historic range. This column does not imply any limitation on the application of the prohibitions in the Act or implementing rules. Such prohibitions apply to all individuals of the species, wherever found.

(f)(1) A footnote to the **Federal Register** publication(s) listing or reclassifying a species is indicated under the column "When listed." Footnote numbers to §§ 17.11 and 17.12 are in the same numerical sequence, since plants and animals may be listed in the same **Federal Register** document. That document, at least since 1973, includes a statement indicating the basis for the listing, as well as the effective date(s) of said listing.

(2) The "Special rules" and "Critical habitat" columns provide a cross reference to other sections in Parts 17, 222, 226, or 227. The "Special rules" column will also be used to cite the special rules that describe experimental populations and determine if they are essential or nonessential. Separate listing will be made for experimental populations, and the status column will include the following symbols: "XE" for an essential experimental population and "XN" for a nonessential experimental population. The term "NA" (not applicable) appearing in either of these two columns indicates that there are no special rules and/or critical habitat for that particular species. However, all other appropriate rules in Parts 17, 217–227, and 402 still apply to that species. In addition, there may be other rules in this Title that relate to such wildlife, e.g., port-of-entry requirements. It is not intended that the references in the "Special rules" column list all the regulations of the two Services which might apply to the species or to the regulations of other Federal agencies or State or local governments.

(g) The listing of a particular taxon includes all lower taxonomic units. For example, the genus *Hylobates* (gibbons) is listed as Endangered throughout its entire range (China, India, and SE Asia); consequently, all species, subspecies, and populations of that genus are considered listed as Endangered for the purposes of the Act. In 1978 (43 FR 6230–6233) the species *Haliaeetus leucocephalus* (bald eagle) was listed as Threatened in "USA (WA, OR, MN, WI, MI)" rather than its entire population; thus, all individuals of the bald eagle found in those five States are considered listed as Threatened for the purposes of the Act.

(h) The "List of Endangered and Threatened Wildlife" is provided below:

Editorial Note: This is a compilation and special reprint of 50 CFR 17.11 and 17.12 and is current as of the date shown on the cover. Minor changes and corrections to the October 1, 1986, compilation of 50 CFR have been incorporated in this printing, as well as all published final rules that have subsequently appeared in the **Federal Register**. Otherwise no entry in these lists has been significantly affected. This list has been prepared by the staff of the Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, D.C. 20240. Readers are requested to advise the Service of any errors in this list. Copies are available from the Publication Unit, US Fish and Wildlife Service, Washington, D.C. 20240.

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Eagle, Greenland white-tailed	*Haliaeetus albicilla groenlandicus*	Greenland and adjacent Atlantic islands	do	E	15	NA	NA
Eagle, harpy	*Harpia harpyja*	Mexico south to Argentina	do	E	15	NA	NA
Eagle, Philippine (=monkey-eating)	*Pithecophaga jefferyi*	Philippines	do	E	3	NA	NA
Eagle, Spanish imperial	*Aquila heliaca adalberti*	Spain, Morocco, Algeria	Entire	E	3	NA	NA
Egret, Chinese	*Egretta eulophotes*	China, Korea	do	E	3	NA	NA
Falcon, American peregrine	*Falco peregrinus anatum*	Nests from central Alaska across north-central Canada to central Mexico, winters south to South America.	do	E	2, 3, 145	17.95(b)	NA
Falcon, Arctic peregrine	*Falco peregrinus tundrius*	Nests from northern Alaska to Greenland; winters south to Central and South America.	do	T	2, 3, 145	NA	NA
Falcon, Eurasian peregrine	*Falco peregrinus peregrinus*	Europe, Eurasia south to Africa and Mideast.	do	E	15	NA	NA
Falcon, northern aplomado	*Falco femoralis septentrionalis*	U.S.A. (AZ, NM, TX), Mexico, Guatemala.	do	E	216	NA	NA
Falcon, peregrine	*Falco peregrinus*	Worldwide, except Antarctica and most Pacific Islands.	Wherever found in wild in the conterminous 48 States.	E(S/A)	145	NA	NA
Finch, Laysan (honeycreeper)	*Telespyza (=Psittirostra) cantans*	U.S.A. (HI)	Entire	E	1	NA	NA
Finch, Nihoa (honeycreeper)	*Telespyza (=Psittirostra) ultima*	do	do	E	1	NA	NA
Flycatcher, Euler's	*Empidonax euleri johnstonei*	West Indies: Grenada	do	E	3	NA	NA
Flycatcher, Seychelles paradise	*Terpsiphone corvina*	Indian Ocean: Seychelles	do	E	3	NA	NA
Flycatcher, Tahiti	*Pomarea nigra*	South Pacific Ocean: Tahiti	do	E	3	NA	NA
Fody, Seychelles (weaver-finch)	*Foudia sechellarum*	Indian Ocean: Seychelles	do	E	3	NA	NA
Frigatebird, Andrew's	*Fregata andrewsi*	East Indian Ocean	do	E	15	NA	NA
Goose, Aleutian Canada	*Branta canadensis leucopareia*	U.S.A. (AK, CA, OR, WA), Japan	do	E	1, 3	NA	NA
Goose, Hawaiian (=nene)	*Nesochen (=Branta) sandvicensis*	U.S.A. (HI)	do	E	1	NA	NA
Goshawk, Christmas Island	*Accipiter fasciatus natalis*	Indian Ocean: Christmas Island	do	E	3	NA	NA
Grackle, slender-billed	*Quisicalus (=Cassidix) palustris*	Mexico	do	E	3	NA	NA
Grasswren, Eyrean (flycatcher)	*Amytornis goyderi*	Australia	do	E	3	NA	NA
Grebe, Atitlan	*Podilymbus gigas*	Guatemala	do	E	3	NA	NA
Greenshank, Nordmann's	*Tringa guttifer*	U.S.S.R., Japan, south to Malaya, Borneo.	do	E	15	NA	NA
Guan, horned	*Oreophasis derbianus*	Guatemala, Mexico	do	E	3	NA	NA
Gull, Audouin's	*Larus audouinii*	Mediterranean Sea	do	E	3	NA	NA
Gull, relict	*Larus relictus*	India, China	do	E	15	NA	NA
Hawk, Anjouan Island sparrow	*Accipiter francesii pusillus*	Indian Ocean: Comoro Islands	do	E	3	NA	NA
Hawk, Galapagos	*Buteo galapagoensis*	Ecuador (Galapagos Islands)	do	E	3	NA	NA
Hawk, Hawaiian (=Io)	*Buteo solitarius*	U.S.A. (HI)	do	E	1	NA	NA
Hermit, hook-billed (hummingbird)	*Glaucis (=Ramphodon) dohrnii*	Brazil	do	E	15	NA	NA
Honeycreeper, crested (='akohekohe)	*Palmeria dolei*	U.S.A. (HI)	do	E	1	NA	NA
Hornbill, helmeted	*Rhinoplax vigil*	Thailand, Malaysia	do	E	15	NA	NA
Honeyeater, helmeted	*Meliphaga cassidix*	Australia	do	E	4	NA	NA
Ibis, Japanese crested	*Nipponia nippon*	China, Japan, U.S.S.R., Korea	do	E	3	NA	NA
Kagu	*Rhynochetos jubatus*	South Pacific Ocean: New Caledonia	do	E	3	NA	NA
Kakapo (=owl-parrot)	*Strigops habroptilus*	New Zealand	do	E	3	NA	NA
Kestrel, Mauritius	*Falco punctatus*	Indian Ocean: Mauritius	do	E	3	NA	NA
Kestrel, Seychelles	*Falco araea*	Indian Ocean: Seychelles Islands	do	E	3	NA	NA
Kingfisher, Guam Micronesian	*Halcyon cinnamomina cinnamomina*	Western Pacific Ocean; U.S.A. (Guam)	do	E	156	NA	NA
Kite, Cuba hook-billed	*Chondrohierax uncinatus wilsonii*	West Indies: Cuba	do	E	3	NA	NA
Kite, Everglade snail	*Rostrhamus sociabilis plumbeus*	U.S.A. (FL), Cuba	Florida	E	1	17.95(b)	NA
Kite, Grenada hook-billed	*Chondrohierax uncinatus mirus*	West Indies: Grenada	Entire	E	3	NA	NA

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Robin, scarlet-breasted (flycatcher)	*Petroica multicolor multicolor*	Australia (Norfolk Island)	do	E	3	NA	NA
Rockfowl, grey-necked	*Picathartes oreas*	Cameroon, Gabon	do	E	3	NA	NA
Rockfowl, white-necked	*Picathartes gymnocephalus*	Africa: Togo to Sierra Leone	do	E	3	NA	NA
Roller, long-tailed ground	*Uratelornis chimaera*	Malagasy Republic (=Madagascar)	do	E	3	NA	NA
Scrub-bird, noisy	*Atrichornis clamosus*	Australia	do	E	3	NA	NA
Shama, Cebu black (thrush)	*Copsychus niger cebuensis*	Philippines	do	E	3	NA	NA
Shearwater, Newell's Townsend's (formerly Manx) (='A'o).	*Puffinus auricularis* (formerly *puffinus*) *newelli.*	U.S.A. (HI)	do	T	10	NA	NA
Shrike, San Clemente loggerhead	*Lanius ludovicianus meamsi*	U.S.A. (CA)	do	E	26	NA	NA
Siskin, red	*Carduelis* (=*Spinus*) *cucullata*	South America	do	E	15	NA	NA
Sparrow, Cape Sable seaside	*Ammodramus* (=*Ammospiza*) *maritimus mirabilis.*	U.S.A. (FL)	do	E	1	17.95(b)	NA
Sparrow, dusky seaside	*Ammodramus* (=*Ammospiza*) *maritimus nigrescens.*	do	do	E	1	17.95(b)	NA
Sparrow, Florida grasshopper	*Ammodramus savannarum floridanus*	do	do	E	239	NA	NA
Sparrow, San Clemente sage	*Amphispiza belli clementeae*	U.S.A. (CA)	do	T	26	NA	NA
Starling, Ponape mountain	*Aplonis pelzelni*	West Pacific Ocean: U.S.A. (Caroline Islands).	do	E	3	NA	NA
Starling, Rothschild's (myna)	*Leucopsar rothschildi*	Indonesia (Bali)	do	E	3	NA	NA
Stilt, Hawaiian (=Ae'o)	*Himantopus mexicanus* (=*himantopus*) *knudseni.*	U.S.A. (HI)	do	E	2	NA	NA
Stork, oriental white	*Ciconia ciconia boyciana*	China, Japan, Korea, U.S.S.R	do	E	3	NA	NA
Stork, wood	*Mycteria americana*	U.S.A., (CA, AZ, TX, to Carolinas), Mexico, Central and South America.	U.S.A. (AL, FL, GA, SC).	E	142	NA	NA
Swiftlet, Mariana gray (=Vanikoro)	*Aerodramus* (=*Collocalia*) *vanikorensis bartschi.*	Western Pacific Ocean: U.S.A. (Guam, Rota, Tinian, Saipan, Agiguan).	Entire	E	156	NA	NA
Teal, Campbell Island flightless	*Anas aucklandica nesiotis*	New Zealand (Campbell Island)	do	E	15	NA	NA
Tern, California least	*Sterna antillarum* (=*albifrons*) *browni*	Mexico, U.S.A. (CA)	do	E	2, 3	NA	NA
Tern, least	*Sterna antillarum*	U.S.A. (Atlantic and Gulf coasts, Miss. R. Basin, CA), Gr. and Lesser Antilles, Bahamas, Mexico; winters C. America, northern S. America.	U.S.A. [AR, CO, IA, IL, IN, KS, KY, LA (Miss. R. and tribs. N of Baton Rouge), MS (Miss. R.), MO, MT, NE, NM, ND, OK, SD, TN, TX (Except within 50 miles of coast)].	E	182	NA	NA
Thrasher, white-breasted	*Ramphocinclus brachyurus*	West Indies: St. Lucia, Martinique	Entire	E	3	NA	NA
Thrush, large Kauai	*Myadestes* (=*Phaeornis*) *myadestinus*	U.S.A. (HI)	do	E	2	NA	NA
Thrush, Molokai (=oloma'o)	*Myadestes* (=*Phaeornis*) *lanaiensis* (=*obscurus*) *rutha.*	do	do	E	2	NA	NA
Thrush, New Zealand (wattlebird)	*Turnagra capensis*	New Zealand	do	E	3	NA	NA
Thrush, small Kauai (=puaiohi)	*Myadestes* (=*Phaeornis*) *palmeri*	U.S.A. (HI)	do	E	1	NA	NA
Tinamou, solitary	*Tinamus solitarius*	Brazil, Paraguay, Argentina	do	E	15	NA	NA
Trembler, Martinique (thrasher)	*Cinclocerthia ruficauda gutturalis*	West Indies: Martinique	do	E	3	NA	NA
Vireo, least Bell's	*Vireo bellii pusillus*	U.S.A. (CA), Mexico	do	E	228	NA	NA
Wanderer, plain (collared-hemipode)	*Pedionomous torquatus*	Australia	do	E	6	NA	NA
Warbler (wood), Bachman's	*Vermivora bachmanii*	U.S.A.(Southeastern), Cuba	do	E	1, 3	NA	NA
Warbler (wood), Barbados yellow	*Dendroica petechia petechia*	West Indies: Barbados	do	E	3	NA	NA

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REFERENCE NO. 23

Scale 1:250,000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

5 0 5 10 15 Nautical Miles

TRANSVERSE MERCATOR PROJECTION

BLACK NUMBERED LINES INDICATE THE 10,000 METER UNIVERSAL TRANSVERSE MERCATOR GRID, ZONE 18

FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092, OR DENVER, COLORADO 80225

TERRESTRIAL ORGANISMS

Shown in BROWN; species with special status shown in RED (F) or (S) indicates species protected by Federal or State Legislation (see text)

SYMBOL SPECIES

PLANTS (301–350)

301 Eastern hemlock
302 Spleenwort (S)
303 Spider lily (S)
304 Pond bush (S)
305 Watermilfoil (S)
306 Hooded pitcher plant (S)
307 Tree
308 Prickly pear cactus (S)
309 Trailing arbutus (S)
310 Eastern bumelia
311 Pitcher plant
312 Baldcypress
313 Redbay
314 Seaside alder
315 Box huckleberry
316 Purple fringeless orchid
317 Pink lady's slipper
318 Ebony spleenwort (S)
319 Orchids (S)
320 Golden club (S)
321 Florida beargrass
322 East-coast coontie
323 Fall-flowering ixia
324 Jackson-vine
325 Spoon-flower
326 Curtiss milkweed
327 Sea lavender
328 Hand fern
329 Needle palm
330 Yellow squirrel-banana
331 Beach creeper
332 Florida coontie
333 Four-petal pawpaw
334 Bird's nest spleenwort
335 Burrowing four-o'clock
336 Beach star
337 Silver palm
338 Dancing lady orchid
339 Tamarindillo
340 Fuch's bromeliad
341 Everglades peperomia
342 Buccaneer palm
343 Slender spleenwort
344 Pineland jacquemontia
345 Mahogany mistletoe
346 Florida thatch
347 Twisted air plant
348 Long's bittercress
349 Venus's flytrap

INVERTEBRATES (351–400)

351 [illegible]
352 Zebra butterfly

BIRDS (401–600)

SHOREBIRDS (401–430)

401 Shorebirds
402 Terns
403 Gulls
404 Forster's tern
405 Arctic tern
406 Least tern (S)
407 Roseate tern (S)
408 Common tern
409 Great black-backed gull
410 Herring gull
411 Laughing gull
412 Black skimmer (S)
413 Turnstones
414 Plovers
415 Piping plover
416 American oystercatcher (S)

WADING BIRDS (431–460)

431 Wading birds
432 Herons
433 Egrets

151

Newark

N. J.—N. Y.—PA.

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1:250 000-scale map of

Atlantic Coast Ecological Inventory

Produced by
U. S. FISH AND WILDLIFE SERVICE
1980

[illegible]
[illegible] Terns
403 Gulls
404 Forster's tern
405 Arctic tern
406 Least tern (S)
407 Roseate tern (S)
408 Common tern
409 Great black-backed gull
410 Herring gull
411 Laughing gull
412 Black skimmer (S)
413 Turnstones
414 Plovers
415 Piping plover
416 American oystercatcher (S)

WADING BIRDS (431–460)
431 Wading birds
432 Herons
433 Egrets
434 Rails
435 Ibises
436 Bitterns
437 Great blue heron (S)
438 Wood ibis (S)
439 Anhinga
440 Little blue heron (S)
441 Yellow-crowned night heron (S)
442 Black-crowned night heron
443 Florida sandhill crane (S)
444 Louisiana heron (S)
445 Limpkin (S)
446 Roseate spoonbill (S)
447 Snowy egret (S)
448 Magnificent frigate-bird (S)
449 Reddish egret (S)
450 Clapper rail
451 King rail
452 Virginia rail
453 Sora rail

WATERFOWL (461–500)
461 Waterfowl
462 Swans
463 Geese
464 Dabbling ducks
465 Diving ducks
466 Common eider
467 Harlequin duck
468 Wood duck
469 Fulvous tree duck
470 Loons
471 Grebes
472 Brant geese
473 Snow goose
474 Gadwall
475 Black duck

RAPTORS (501–530)
501 Raptors
502 Owls
503 Kites
504 Hawks
505 Bald eagle (F)
506 Osprey (S)
507 Peregrine falcon (F)
508 Copper's hawk (S)
509 Swallow-tailed kite
510 Marsh hawk (S)
511 Southeastern American kestrel (S)
512 Florida burrowing owl (S)

SEABIRDS (531–550)
531 Seabirds
532 Petrels, shearwaters, and albatroses
533 Pelican and allies
534 Alcids
535 Brown pelican (F)
536 Black guillemot
537 Leach's petrel
538 Razorbill
539 Common puffin
540 Double-crested cormorant
541 Gannet
542 Wilson's petrel
543 Northern phalarope
544 Audubon's shearwater
545 Greater shearwater
546 Shearwaters
547 Petrels
548 Jaegers
549 White pelican

SONGBIRDS AND OTHERS (551–600)
551 Songbirds and others
552 Red-cockaded woodpecker (F)
553 Chachalaca
554 Bachman's warbler (F)
555 Wild turkey
556 American woodcock
557 Pileated woodpecker
558 Swainson's warbler
559 Ruffed grouse
560 Bobwhite
561 Mourning dove
562 Warblers
563 Ring-necked pheasant
564 Bank swallow
565 Dusky seaside sparrow (F)
566 White-crowned pigeon (S)

REPTILES AND AMPHIBIANS (601–700)
601 Eastern narrow-mouthed toad (S)
602 Eastern [illegible]
603 [illegible]

152

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1980

AQUATIC ORGANISMS

Shown in BLUE; species with special status shown in RED-(F) or (S) indicates species protected by Federal or State Legislation (see text)

SYMBOL	SPECIES
	PLANTS (1–50)
	1 Irish moss
	2 Rockweed
	INVERTEBRATES (51–100)
	51 Crabs
	52 Mussels
	53 Oysters
	54 Scallops
	55 Clams
	56 Worms
	57 Shrimp
	58 American lobster
	59 Blue crab
	60 Eastern oyster
	61 European oyster
	62 Bay scallop
	63 Deep-sea scallop
	64 Calico scallop
	65 Surf clam
	66 Hard clam
	67 Soft shell clam
	68 Brackish-water clam
	69 Bloodworm
	70 Sandworm
	71 White shrimp
	72 Brown shrimp
	73 Northern shrimp
	74 Rock crab
	75 Jonah crab
	76 Whelk
	77 Ocean quahog
	78 Pink shrimp
	79 Stone crab
	80 Spiny lobster
	FISH (101–200)
	101 Sharks, skates, rays
	102 Herring
	103 Salmon and trout
	104 Catfish
	105 Cod
	106 Sunfish and bass
	107 Drum
	108 Flatfish
	109 Longnose gar
	110 Shortnose sturgeon (F)
	111 Atlantic sturgeon (S)
	112 American eel
	113 Blueback herring
	114 Hickory shad
	115 Alewife
	116 American shad (S)
	117 Atlantic menhaden
	118 Atlantic herring
	119 Gizzard shad
	120 Tarpon
	121 Atlantic salmon
	122 White catfish
	123 Channel catfish
	124 Yellow bullhead
	125 Brown bullhead
	126 Flat bullhead
	127 Sea catfish
	128 White perch
	129 Striped bass
	130 Black sea bass
	131 Redbreast sunfish
	132 Warmouth
	133 Bluegill
	134 Largemouth bass
	135 Black crappie
	136 Sheepshead
	137 Spotted seatrout
	138 Weakfish
	139 Spot
	140 Atlantic croaker
	141 Southern kingfish
	142 Northern kingfish
	143 Gulf kingfish
	144 Red drum
	145 Star drum
	146 Black drum

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[illegible] Razorbill
539 Common [illegible]
540 Double-crested cormorant
541 Gannet
542 Wilson's petrel
543 Northern phalarope
544 Audubon's shearwater
545 Greater shearwater
546 Shearwaters
547 Petrels
548 Jaegers
549 White pelican

SONGBIRDS AND OTHERS (551–600)

551 Songbirds and others
552 Red-cockaded woodpecker (F)
553 Chachalaca
554 Bachman's warbler (F)
555 Wild turkey
556 American woodcock
557 Pileated woodpecker
558 Swainson's warbler
559 Ruffed grouse
560 Bobwhite
561 Mourning dove
562 Warblers
563 Ring-necked pheasant
564 Bank swallow
565 Dusky seaside sparrow (F)
566 White-crowned pigeon (S)

REPTILES AND AMPHIBIANS (601–700)

601 Eastern narrow-mouthed toad (S)
602 Eastern indigo snake (F)
603 American alligator (F)
604 Northern diamondback terrapin
605 Amphibians
606 Greater siren
607 Bog turtle (S)
608 Gopher tortoise (S)
609 Eastern tiger salamander (S)
610 Northern fence lizard
611 Five-lined skink
612 Map turtle
613 Plymouth red-bellied turtle (F)
614 Eastern diamondback rattlesnake
615 Carolina gopher frog
616 Florida gopher frog (S)
617 Atlantic salt marsh watersnake (F)
618 American crocodile (F)
619 Florida Keys mole skink (S)
620 Florida black-headed snake (S)
621 Pine barrens tree frog (S)
622 Northern pine snake (S)
623 Corn snake (S)
624 Timber rattlesnake (S)
625 Southern gray tree frog (S)

MAMMALS (701–800)

701 Beaver
702 Whitetail deer
703 European fallow deer
704 Blackbeard Island deer
705 Opossum
706 Marsh rabbit
707 Rice rat
708 Raccoon
709 St. Simon Island raccoon
710 Mink
711 River otter (F)
712 Feral hog
713 Feral cow
714 Cumberland Island pocket gopher
715 Anastasia Island cotton mouse
716 Aquatic furbearers
717 Black bear (S)
718 Bobcat
719 Eastern gray squirrel
720 Eastern fox squirrel
721 Eastern cottontail
722 Delmarva fox squirrel (F)
723 Muskrat
724 Red fox
725 Bats
726 Gray fox
727 Striped skunk
728 Nutria
729 Longtail weasel
730 Colonial pocket gopher (S)
731 Wild ponies
732 Sika deer
733 Beach meadow vole
[illegible]
736 Sherman's fox squirrel (S)
737 Florida mouse (S)
738 Florida panther (F)
739 Goff's pocket gopher (S)
740 Key Largo wood rat (S)
741 Lower keys cotton rat (S)
742 Key Largo cotton mouse (S)

HABITAT USE

Shown in RED for species with special status, BLUE for aquatic organisms and BROWN for terrestrial organisms

a Spawning ground
b Nursery
c Commercial harvesting area
d Adult concentration
e Overwintering area
f Sport fishing/hunting area
g Migratory area
h Nesting area
i Unusual distribution or specimen

113 Blueback herring
114 Hickory shad
115 Alewife
116 American shad (S)
117 Atlantic menhaden
118 Atlantic herring
119 Gizzard shad
120 Tarpon
121 Atlantic salmon
122 White catfish
123 Channel catfish
124 Yellow bullhead
125 Brown bullhead
126 Flat bullhead
127 Sea catfish
128 White perch
129 Striped bass
130 Black sea bass
131 Redbreast sunfish
132 Warmouth
133 Bluegill
134 Largemouth bass
135 Black crappie
136 Sheepshead
137 Spotted seatrout
138 Weakfish
139 Spot
140 Atlantic croaker
141 Southern kingfish
142 Northern kingfish
143 Gulf kingfish
144 Red drum
145 Star drum
146 Black drum
147 Summer flounder
148 Southern flounder
149 Winter flounder
150 Rainbow smelt
151 Atlantic tomcod
152 Threadfin shad
153 Carp
154 Atlantic mackerel
155 Chain pickerel
156 White bass
157 Northern puffer
158 Silver perch
159 Florida pompano
160 Bluefish
161 Spanish mackerel
162 Cobia
163 Mullet
164 White crappie
165 Redear sunfish
166 Smallmouth bass
167 Yellow perch
168 Pumpkinseed
169 Atlantic halibut
170 Atlantic cod
171 Pollock
172 Haddock
173 Hake
174 Bluefin tuna
175 Walleye
176 Northern pike
177 Scup
178 Tautog
179 Atlantic spadefish
180 Bay anchovy
181 Butterfish
182 Little tunny
183 Atlantic bonito
184 Brown trout
185 Cunner
186 Yellowtail flounder
187 Gulf flounder
188 Pinfish
189 King mackerel
190 Pigfish
191 White grunt
192 Tripletail
193 Ladyfish
194 Snook
195 Jack
196 Snapper
197 Grouper
198 Sailfish
199 Great barracuda
200 Maryland darter (F)

REPTILES AND AMPHIBIANS (201–250)

201 Green sea turtle (F)
202 Loggerhead sea turtle (F)
203 Hawksbill turtle (F)
204 Atlantic ridley turtle (F)
205 Leatherback turtle (F)

MAMMALS (251–300)

251 Florida manatee (F)
252 Atlantic bottlenose dolphin
253 Pigmy sperm whale
254 Short-finned pilot whale
255 Harbor seal
256 Gray seal
257 Right whale (F)
258 Atlantic spotted dolphin

High salinity estuarine habitat (generally 16.5 to 30 parts per thousand). [illegible] used for wide estuaries.

Mid salinity estuarine habitat (generally 5 to 16.5 parts per thousand).

Low salinity estuarine habitat (generally 0.5 to 5 parts per thousand) and tidal freshwater.

Non-tidal freshwater riverine and creek habitat.

LAND USE–LAND COVER SYMBOLS

Study area (coastal zone boundary to three-mile limit)

Special land use areas, including refuges and wildlife management areas, parks and seashores; may be used in lieu of habitat boundary

Subdivision of a special land use area into more than one designation

Swamp

Marsh

Beach/Dunes

Seagrass

Reef

POINT AND AREA FEATURE SYMBOLS

(shown in RED for species with special status; shown in BLUE for aquatic organisms; and shown in BROWN for terrestrial organisms)

Localized concentration of species — 500h

General habitat boundary for indicated species; may be superceded by special land use boundary — 100d

ATLANTIC COAST ECOLOGICAL INVENTORY
NEW YORK, N. Y.–CONN.–N. J.
1980

LEGEND

POPULATED PLACES

- Over 500,000 — BOSTON
- 100,000 to 500,000 — RICHMOND
- 25,000 to 100,000 — EVANSTON
- 5,000 to 25,000 — Newnan
- 1,000 to 5,000 — Bar Harbor
- Less than 1,000 — Fisher

RAILROADS — Single track, Double or Multiple

- Standard gauge
- Narrow gauge

BOUNDARIES

- International
- State
- County
- Park or reservation

Mine

Spot elevation in feet — 221

Landplane airport

Landing area

Seaplane airport

Seaplane anchorage

Power line

Woods-brushwood

ROADS

- Primary, all-weather, hard surface
- Secondary, all-weather, hard surface
- Light-duty, all-weather, improved surface
- Fair or dry weather, unimproved surface
- Trail
- Interchange
- Route markers: Interstate, U.S., State — 95, 29, 93

Landmarks: School; Church; Other

Depth curve in feet

Limit of danger; Reef

Rocks: Awash

Foreshore flat

Intermittent or dry stream

Marsh or swamp

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1980

Produced by U. S. Fish and Wildlife Service

Base map prepared by U. S. Geological Survey 1969

Atlantic coast ecological inventory compiled in 1980 by Fish and Wildlife Service from data furnished by Federal agencies, State agencies, and other sources. Map scale limitation precludes the portrayal of all available information on species occurrence and distribution. A detailed text—Atlantic Coast Ecological Inventory—is available from Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402

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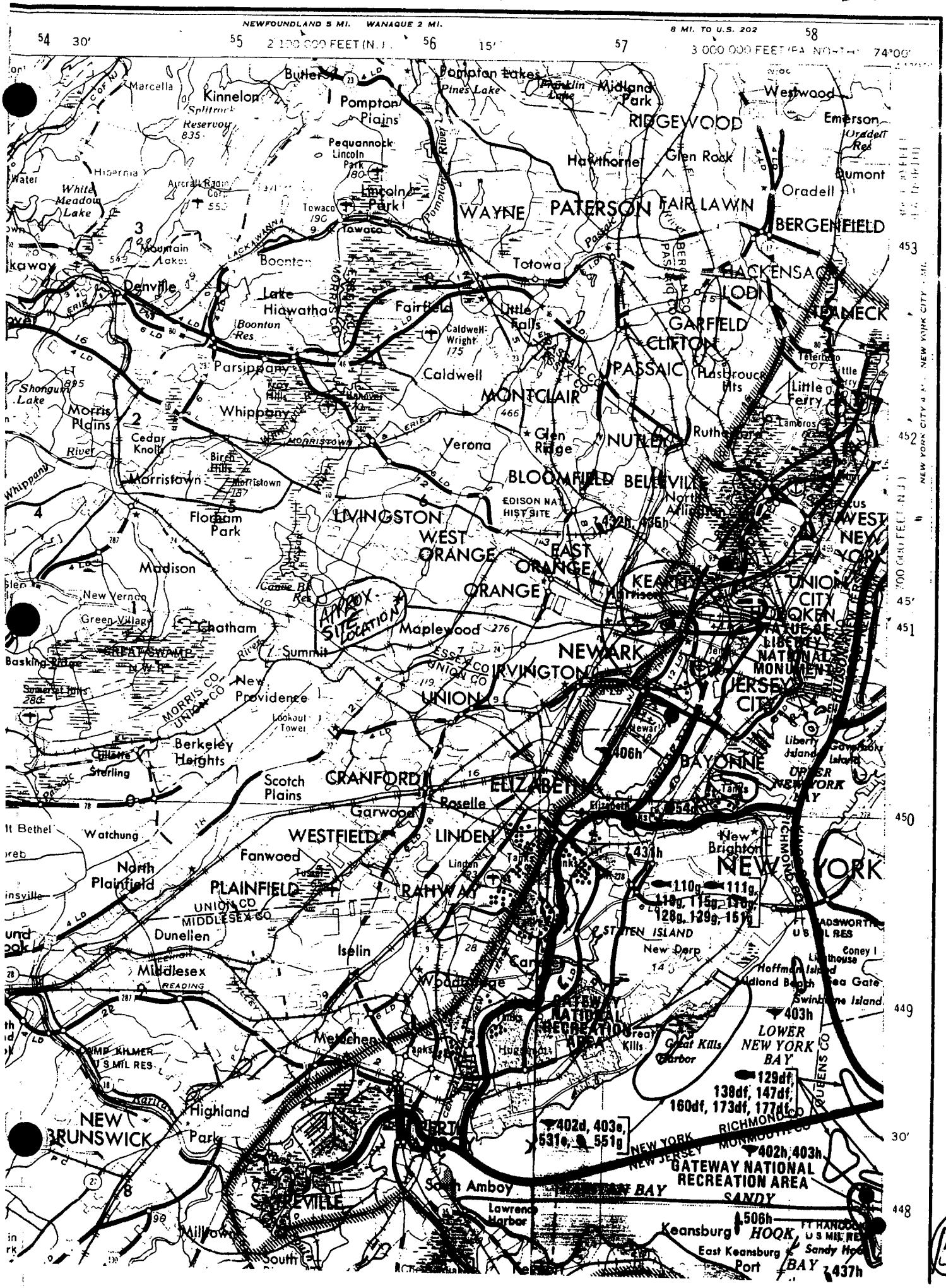
* 2 MILE RADIUS RING AROUND SITE



REFERENCE NO. 24

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DAVID J. BARDIN, COMMISSIONER

WATER SUPPLY OVERLAY
SHEET 26

LEGEND

AREA SERVED BY PRIVATE WATER SERVICE COMPANIES

AREA SERVED BY REGIONALLY OWNED WATER SERVICE COMPANIES

AREA SERVED BY MUNICIPALLY OWNED WATER SERVICE COMPANIES

AREA NOT PRESENTLY SERVED BY WATER SERVICE

PUBLIC SUPPLY WELLS

SURFACE WATER INTAKE

—W— MAJOR WATER MAINS

TOWNSHIP BOUNDARIES

COUNTY BOUNDARIES

STATE BOUNDARIES

ALL MAP COORDINATES ARE FOR THE LOWER LEFT HAND CORNER.

Scale: 1:63,360

1 ½ 0 1 2 3 Kilometers

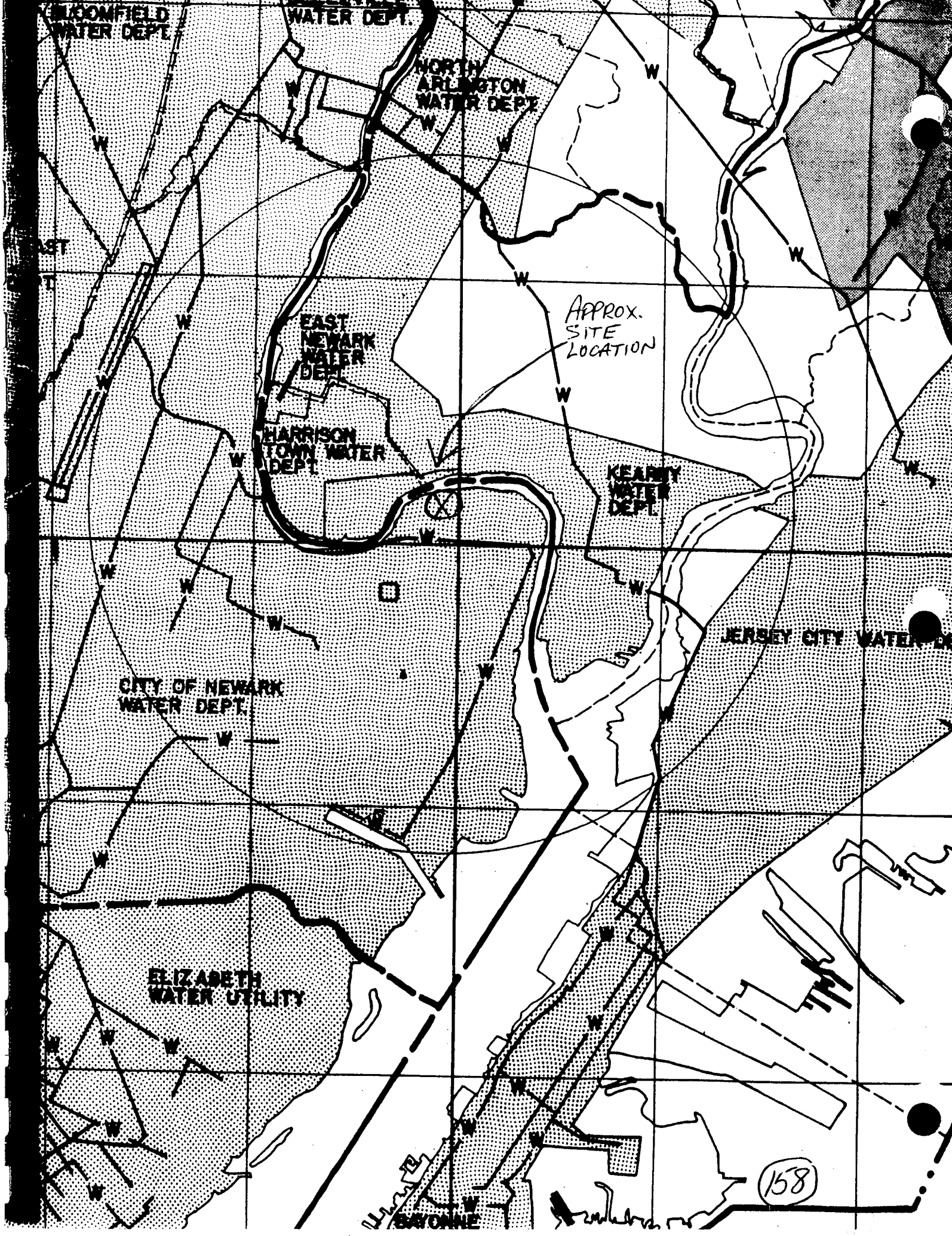
1 ¾ ½ ¼ 0 1 2 3 Miles

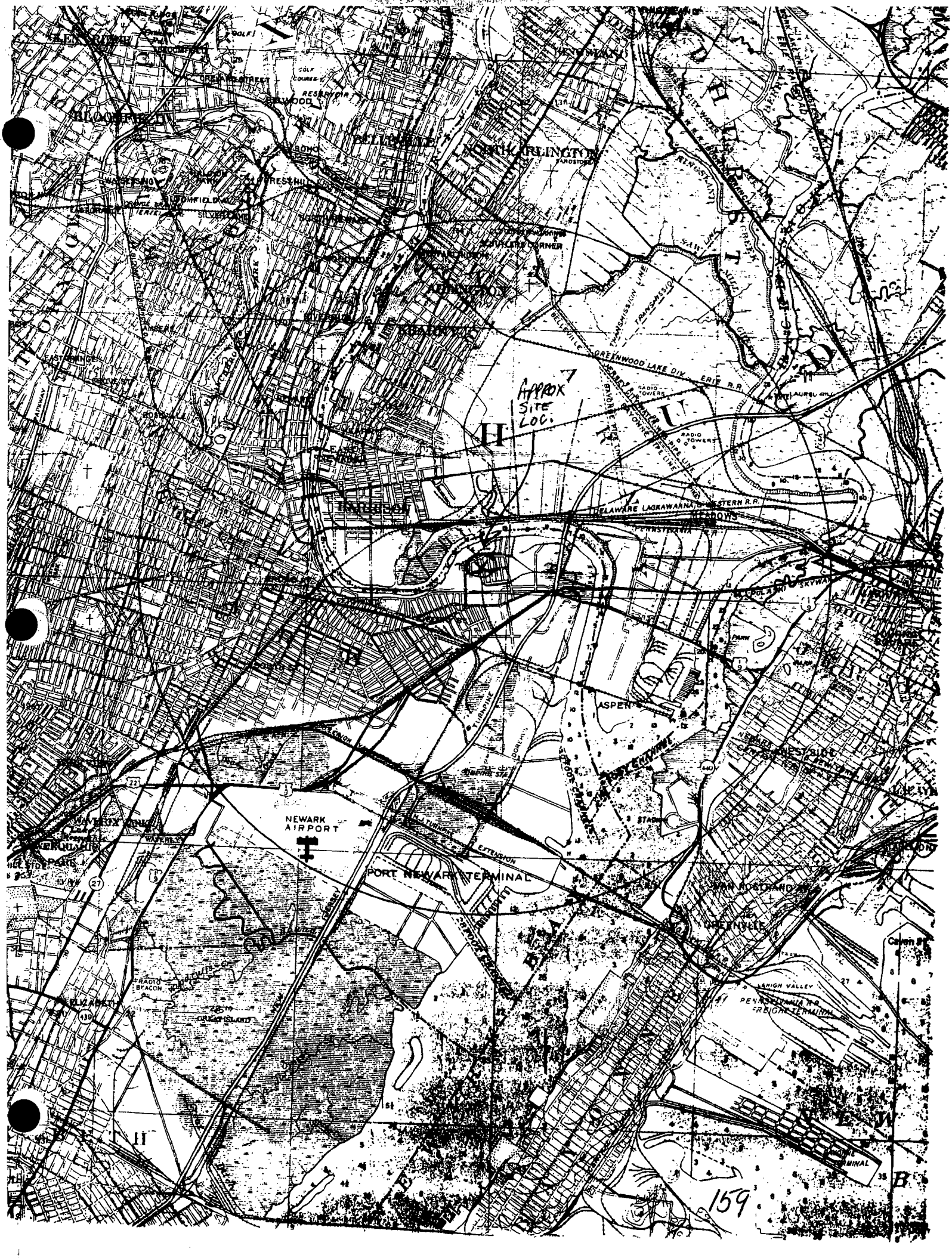
SUPERVISED BY GEORGE J. HALASI-KUN, TOPOGRAPHIC ENGINEER
DRAFTED BY JOHN F. OLSCHEWSKI

ANY CORRECTIONS OR ADDITIONAL INFORMATION WILL BE APPRECIATED

AUGUST 1975

157


BLOOMFIELD WATER DEPT.
WATER DEPT.
NORTH ARLINGTON WATER DEPT.
EAST NEWARK WATER DEPT.
HARRISON TOWN WATER DEPT.
APPROX. SITE LOCATION
KEARNY WATER DEPT.
JERSEY CITY WATER
CITY OF NEWARK WATER DEPT.
ELIZABETH WATER UTILITY
BAYONNE
158



APPROX SITE LOC.
NORTH ARLINGTON
BELLEVILLE
GREENWOOD LAKE DIV. ERIE R.R.
RADIO TOWERS
DELAWARE LACKAWANNA & WESTERN R.R.
MEADOWS
PENNSYLVANIA R.R.
ASPEN
NEWARK AIRPORT
PORT NEWARK TERMINAL
EXTENSION
GREENVILLE
LEHIGH VALLEY
PENNSYLVANIA R.R.
FREIGHT TERMINAL
RADIO BEACON
CREAT ISLAND

159

REFERENCE NO. 25

GSC-TR8645

GRAPHICAL EXPOSURE MODELING SYSTEM

(GEMS)

USER'S GUIDE

VOLUME 2. MODELING

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
EXPOSURE EVALUATION DIVISION
Task No. 3-2
Contract No. 68Ø2397Ø
Project Officer: Russell Kinerson
Task Manager: Loren Hall

Prepared by:

GENERAL SCIENCES CORPORATION
8401 Corporate Drive
Landover, Maryland 20785

Submitted: December 1, 1986

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GEMS> I

CELLOFILM CORP.
LATITUDE 40:44:12 LONGITUDE 74: 8:15 1980 POPULATION

MILES -	1/4	1/2	1	2	3	4	
KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	183	4437	7977	64611	122721	280250	480179
RING TOTALS	183	4437	7977	64611	122721	280250	480179

GEMS> I

CELLOFILM CORP.
LATITUDE 40:44:12 LONGITUDE 74: 8:15 1980 HOUSING

MILES -	1/4	1/2	1	2	3	4	
KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	70	1445	2634	22644	42747	96883	166423
RING TOTALS	70	1445	2634	22644	42747	96883	166423

	POPULATION	HOUSING
1 MILE	12,597	4149
2 MILES	77,208	26,793
3 MILES	199,929	69,540
4 MILES	480,179	166,423

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REFERENCE NO. 26

STATE OF NEW JERSEY
DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT

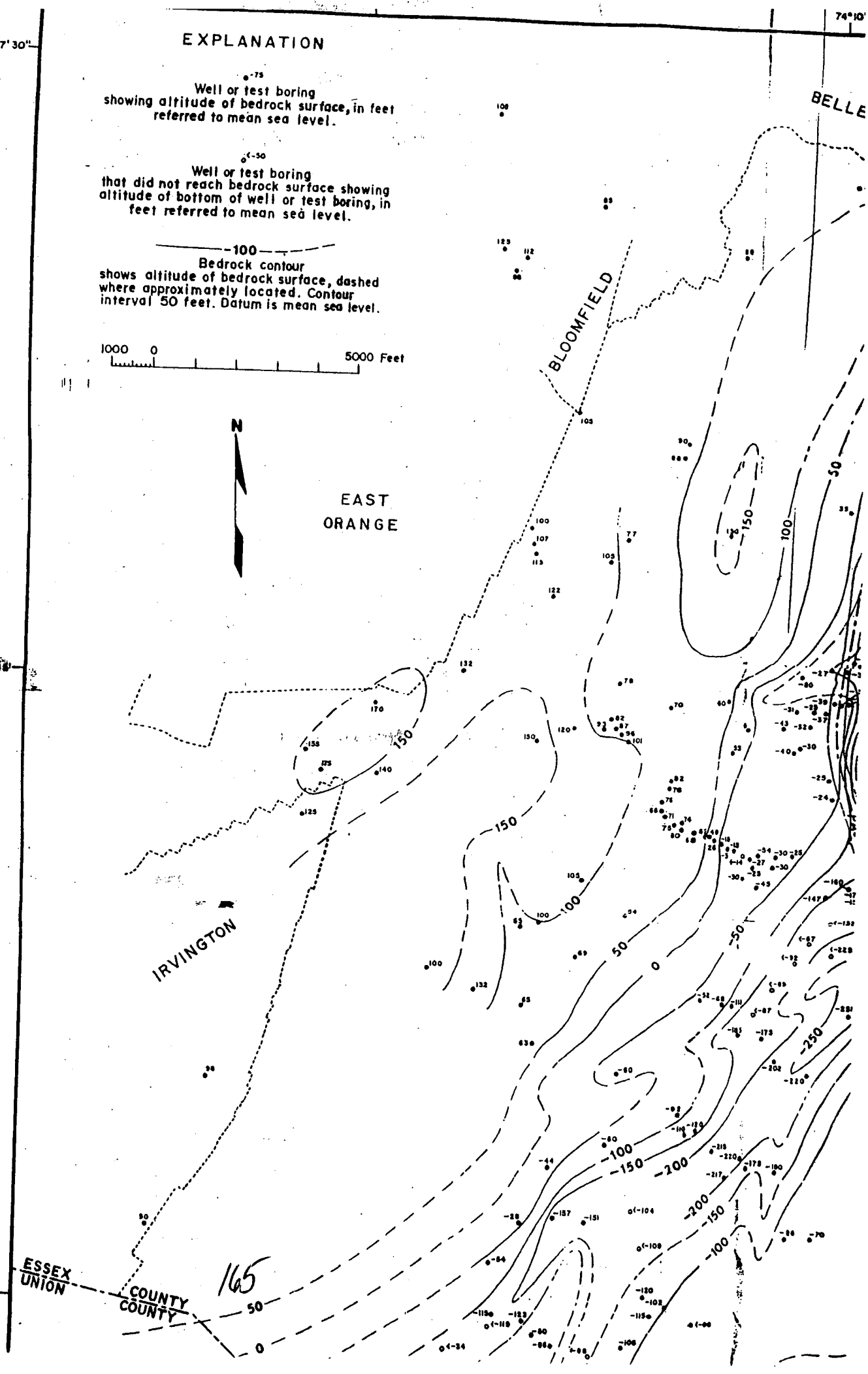
DIVISION OF WATER POLICY
AND SUPPLY

SPECIAL REPORT NO. 28

GROUND-WATER RESOURCES OF ESSEX COUNTY, NEW JERSEY

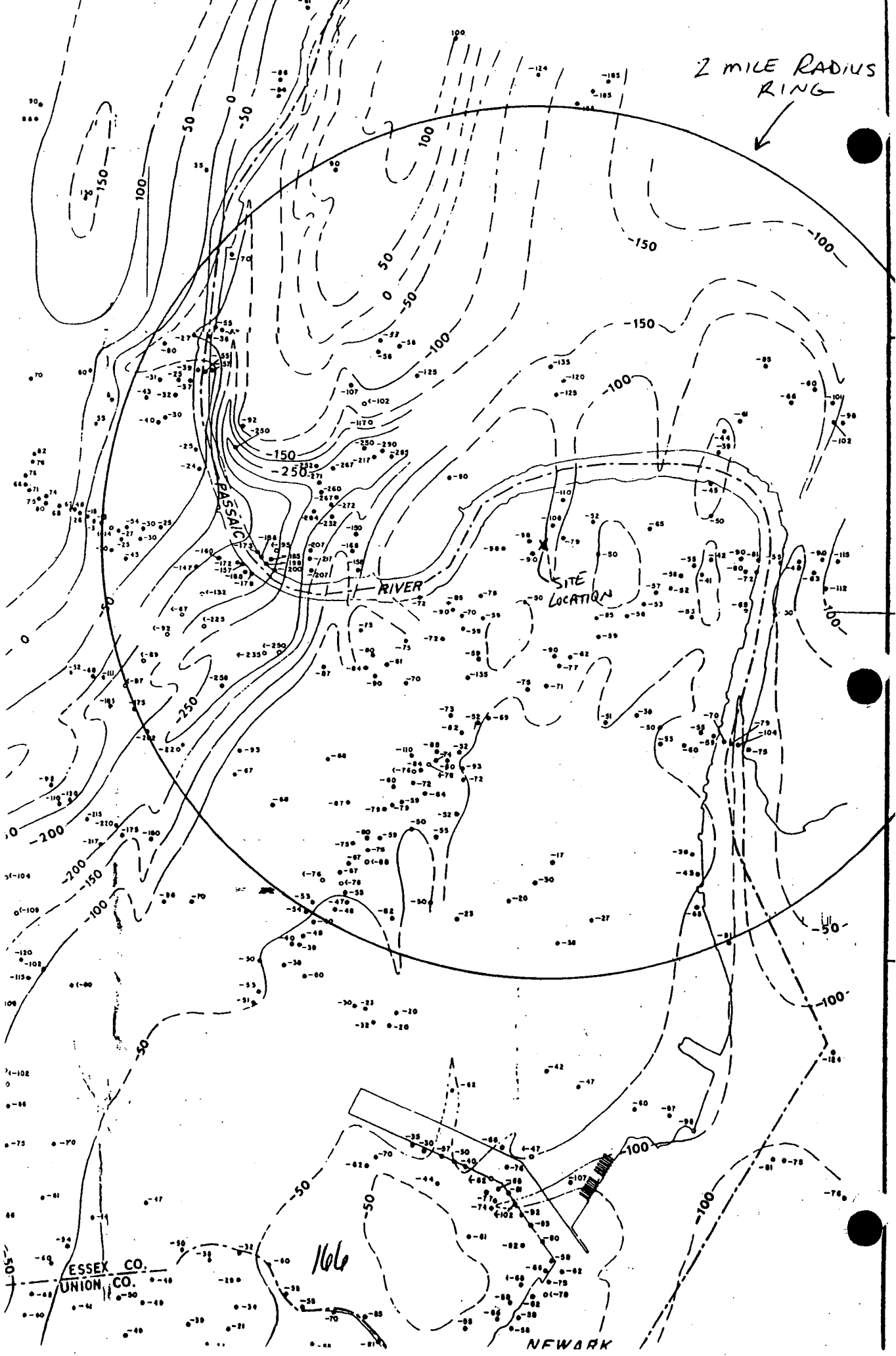
Prepared in cooperation with
the United States Department of the Interior
Geological Survey

1968


EXPLANATION
Well or test boring showing altitude of bedrock surface, in feet referred to mean sea level.
Well or test boring that did not reach bedrock surface showing altitude of bottom of well or test boring, in feet referred to mean sea level.
100
Bedrock contour shows altitude of bedrock surface, dashed where approximately located. Contour interval 50 feet. Datum is mean sea level.
1000 0 5000 Feet
N
EAST ORANGE
BLOOMFIELD
IRVINGTON
BELLE
ESSEX COUNTY
UNION COUNTY
74°10'
40°45'
42'30"

PAGE 1

165


2 MILE RADIUS RING
PASSAIC
RIVER
SITE LOCATION
ESSEX CO.
UNION CO.
NEWARK

PAGE 2

166

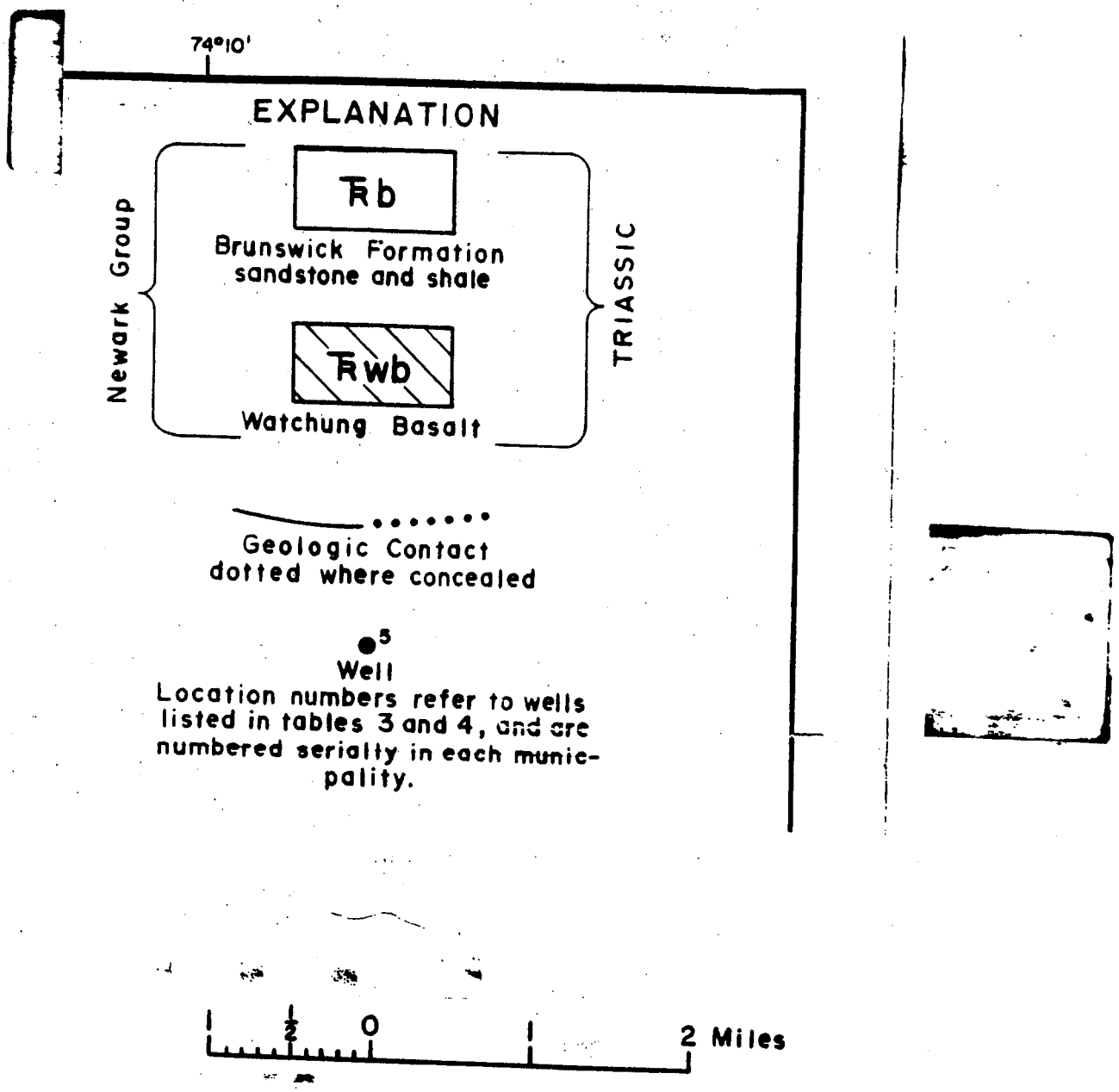
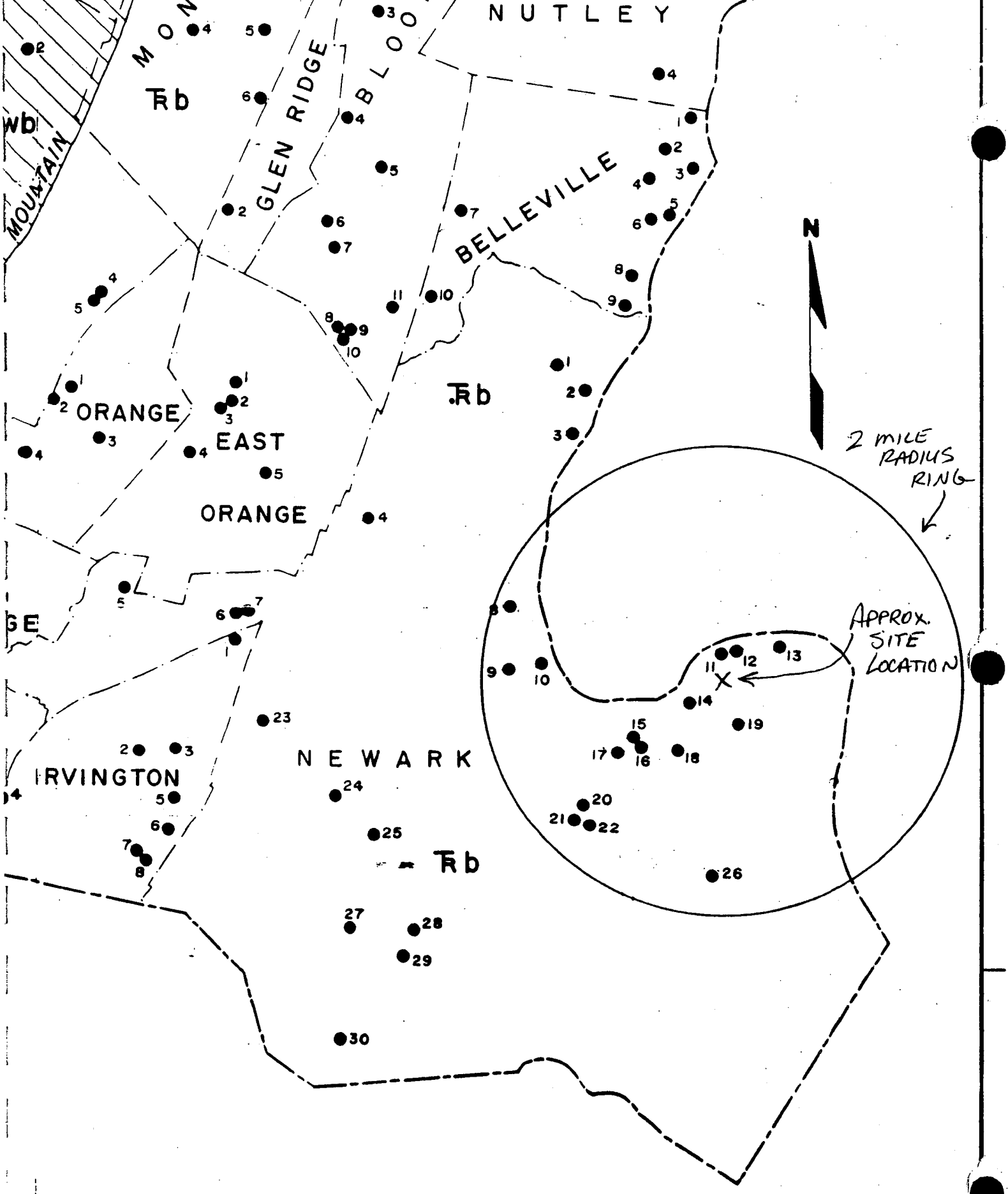
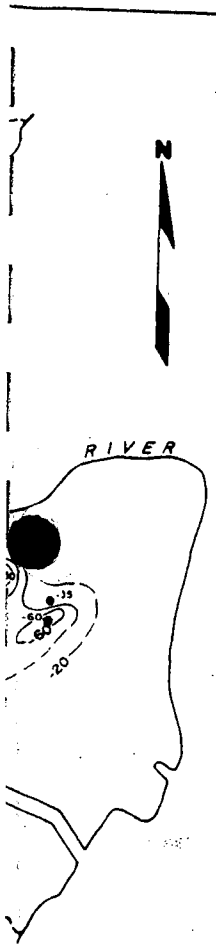


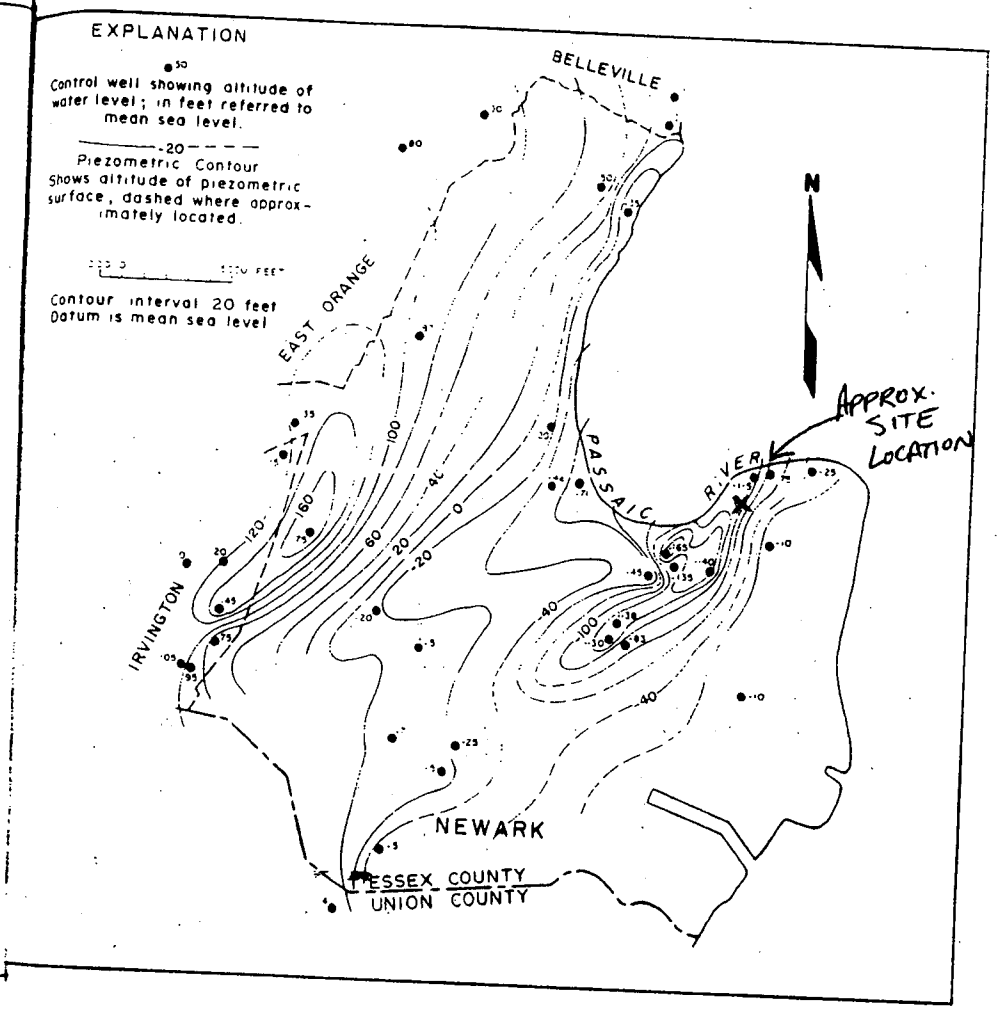
Figure 2.—Generalized bedrock geologic map of Ess



168 PAGE 4

Essex County, N. J. showing locations of selected wells.





swick Formation in wells

Figure 10.—Generalized piezometric contours for the Brunswick Formation in the Newark area based on water levels in wells drilled between 1950 and 1960.

Aquifer name:
Qsd, Stratified drift
TRb, Brunswick Formation
TRwb, Watchung Basalt

TABLE 2.—RECORDS OF SELECTED WELLS IN ESSEX COUNTY, N. J.—Continued

Remarks:
O.W., Owners well number

Well	Owner or Tenant	Driller	Date Drilled	Altitude above mean sea level (ft)	Total depth drilled below land surface (ft)	Diameter of well (inches)	Depth to which well is cased (ft)	Screen setting (ft)	Aquifer	Static level below land surface (feet)	Yield (gpm)	Drawdown (ft)	Specific capacity (gpm/ft)	Remarks
					MONTCLAIR (TOWN)									
1	Bapt & Ruden	Parkhurst Well & Pump Co.	4-29-48	360	250	10	23	none	TRb	5	145	180	.81	
2	Bond's Ice Cream, Inc.	Parkhurst Well & Pump Co.	3-10-50	510	157	8	21	none	TRb	15	150	55	2.73	
3	Town of Montclair	----------	1966	---	300	10	41	none	TRb	24	950	51	18.62	
4	Hahne & Co.	Parkhurst Well & Pump Co.	8- 9-49	280	350	8	31	none	TRb	18	350	182	1.92	O.W.2
5	M. Quadrel	Burrows Well Drilling Co.	June, 1955	260	151	6	18	none	TRb	33	75	---	----	
6	Montclair Auto Minit Man	Rinbrand Well Drilling Co.	1-10-50	---	200	6	16	none	TRb	40	60	---	----	
					NEWARK (CITY)									
1	Aluminum Finishing Co.	J. Foster	7-20-53	50	150	6	55	none	TRb	30	100	30	3.33	
2	Wilber B. Driver Co.	Rinbrand Well Drilling Co.	7- 2-53	15	400	10	93	none	TRb	45	240	155	1.55	O.W.5
3	Pittsburgh Plate Glass Co.	Lauman & Co.	1940	12	---	12	90	none	TRb	9	390	---	----	
4	Mc Evoy Court Apartments	Parkhurst Well & Pump Co.	Oct. 1939	200	206	6	35	none	TRb	84	60	106	.57	
5	Columbia Theaters, Inc.	Wm. Stothoff Co., Inc.	6- 9-53	---	312	8	26	none	TRb	20	140	32	4.38	
6	Pabst Brewing Co., Inc.	Artesian Well & Equip. Co.	5-14-49	190	685	14	39	none	TRb	59	557	67	8.31	O.W.4
7	Pabst Brewing Co., Inc.	Artesian Well & Equip. Co.	7-17-50	185	687	14	55	none	TRb	108	240	120	2.00	O.W.5
8	Newark Milk & Cream Co.	Rinbrand Well Drilling Co.	Feb. 1949	25	700	10	80	none	TRb	60	76	190	.39	
9	Continental Ins. Co.	S. P. D'Alessio	July 1965	---	300	8	58	none	TRb	77	85	72	1.18	
10	Newark Center Corp.	Garden State Artesian Well & Pump Co.	2-18-55	---	700	10-6	150	none	TRb	81	89	144	.62	O.W.1
11	Kolker Chemical Works	Wm. Stothoff Co., Inc.	12-11-51	12	802	12	127	none	TRb	117	600	43	13.95	O.W.2
12	Kolker Chemical Works	Wm. Stothoff Co., Inc.	4-27-49	8	359	10	98	none	TRb	76	300	22	13.63	O.W.1
13	Eureka Construction Co.	Rinbrand Well Drilling Co.	1-23-59	10	500	8	90	none	TRb	25	75	225	.33	
14	P. Ballentine & Sons	----------	1937	12	875	16	95	none	TRb	227	375	153	1.79	O.W.8, Plant #2

Aquifer name:
Qsd, Stratified drift
TRb, Brunswick Formation
TRwb, Watchung Basalt

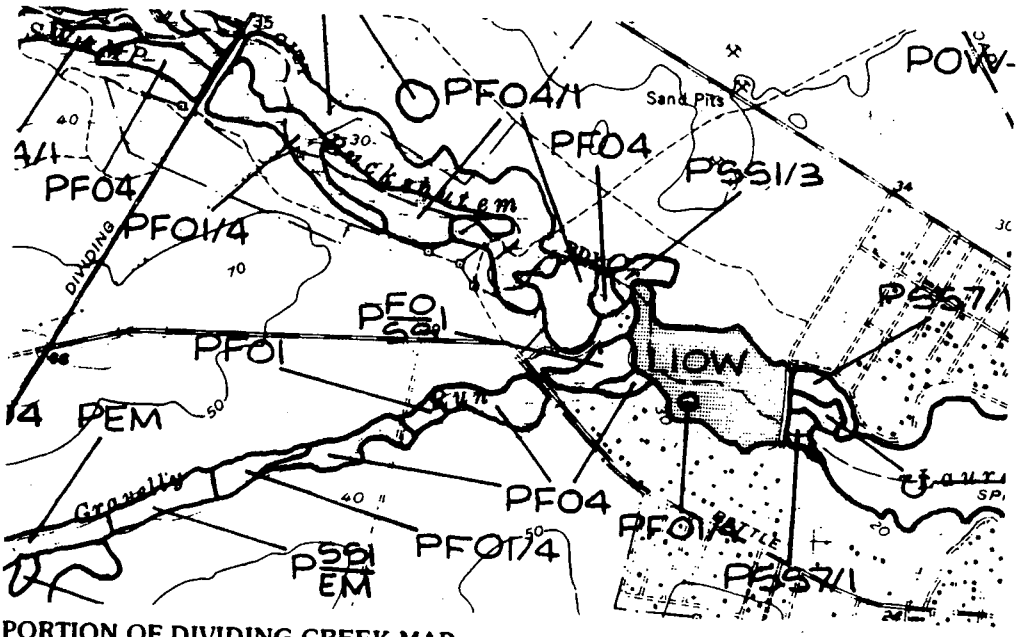
TABLE 2.—RECORDS OF SELECTED WELLS IN ESSEX COUNTY, N. J.—Continued

Remarks:
O.W., Owners well number

Well	Owner or Tenant	Driller	Date drilled	Altitude above mean sea level (ft)	Total depth drilled below land surface (ft)	Diameter of well (inches)	Depth to which well is cased (ft)	Screen setting (ft)	Aquifer	Static level below land surface (feet)	Yield (gpm)	Drawdown (ft)	Specific capacity (gpm/ft)	Remarks
					NEWARK (CITY) - Continued									
15	Celanese Corp. of Amer.	P. H. & J. Colan	1924	12	805	16-10	95	none	TRb	176	400	28	14.29	O.W. 26
16	Celanese Corp. of Amer.	Layne-New York Co.	5-16-47	14	856	16-10	75	none	TRb	147	778	40	19.45	O.W. 27
17	J. Hensler Brewing Co.	P. Chaffitelli	12-14-49	12	700	10-8	57	none	TRb	60	450	240	1.79	O.W. 4
18	Synthetic Plastics Co.	Industrial Well & Pump Co.	1-15-63	14	600	8	145	none	TRb	150	300	110	2.73	O.W. 1
19	Ablon Finishes, Inc.	Frank Bott	7-12-60	15	500	8	88	none	TRb	30	350	70	5.14	
20	Colan Corporation	-------	1930	10	290	8	---	none	TRb	140	160	95	1.59	
21	Universal Grain Co.	Wm. Stothoff Co., Inc.	10-18-51	10	303	8	79	none	TRb	143	200	53	3.77	
22	Mother's Food Products, Inc.	--------	1959	11	400	8	107	none	TRb	94	125	8	15.62	
23	Kar Auto Service Co.	P. Chaffitelli	2- 8-60	208	300	6	35	none	TRb	23	60	104	.58	
24	Food Fair Stores	Burrows Well Drilling Co.	April, 1955	100	298	8	35	none	TRb	105	250	45	5.56	
25	S. & S. Super Service Corp.	Rinbrand Well Drilling Co.	2-18-60	50	190	6	94	none	TRb	45	20	---	----	
26	Rutherford & Delaney Holding Co.	Garden State Artesian Well & Pump Co.	7-31-56	---	220	8-6	42	none	TRb	22	100	73	1.37	O.W. 1
27	Linde Air Products Co.	Artesian Well & Equip. Co.	July, 1954	10	500	12	44	none	TRb	17	124	190	.65	
28	C-O Two Fire Equipment Co.	Parkhurst Well & Pump Co.	4-27-50	10	603	10	127	none	TRb	35	89	215	.41	
29	Suburban Motor Lodge, Inc.	Rinbrand Well Drilling Co.	June, 1950	10	555	8	126	none	TRb	15	20	235	.08	
30	S. B. Penick & Co.	Wm. Stothoff Co., Inc.	8- 7-61	---	400	10	75	none	TRb	60	644	23	28.00	O.W. 2
					NORTH CALDWELL BOROUGH									
1	Green Brook Country Club	H. A. Kieffer	July, 1951	310	300	8	33	none	TRwb	2	25	81	.31	O.W. 3
2	Green Brook Country Club	H. A. Kieffer	March, 1925	290	301	6	---	none	TRb & TRwb	flowing 25 gpm	60	---	----	O.W. 1. Redrilled 1962
3	A. Struse	H. A. Kieffer	8-16-55	---	182	6	42	none	TRwb	65	25	5	5.00	
4	A. F. Leitner	Algeier Bros.	5-14-58	---	195	6	25	none	TRwb	25	7	125	.05	

REFERENCE NO. 27

ATLAS
OF
NATIONAL WETLANDS INVENTORY MAPS
FOR
NEW JERSEY



PORTION OF DIVIDING CREEK MAP

SCALE: 1:24,000

UNITED STATES
DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Region Five
Habitat Resources
One Gateway Center, Suite 700
Newton Corner, Massachusetts

1984

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HOW TO USE THIS ATLAS

The Atlas contains reductions of all 1:24,000 National Wetlands Inventory maps. Maps appear in alphabetical order. Map names can be located on the index map (Figure 2). Each map shows the configuration, location and type of wetlands and deepwater habitats found within a given area.

WETLAND LEGEND

Wetland data are displayed on maps by a series of letters and numbers (alpha-numerics). Mixing of classes and subclasses are represented by a diagonal line. The more common symbols are shown below; less common symbols have been omitted for simplicity. For identifying these latter symbols, the reader should refer to an actual NWI map legend.

Examples of Alpha-numerics:

E2EMN6	=	Estuarine (E), Intertidal(2), Emergent Wetland(EM), Regularly Flooded(N), Oligohaline(6)
E2FL	=	Estuarine(E), Intertidal(2), Flat(FL)
PF01	=	Palustrine(P), Forested Wetland(FO), Broad-leaved Deciduous(1)
PEM/OW	=	Palustrine(P), Emergent Wetland/Open Water(EM/OW)
PFO/SS1	=	Palustrine(P), Forested Wetland/Scrub-Shrub Wetland(FO/SS), Broad-leaved Deceduous(1)

SYMBOLOGY

Systems and Subsystems:

M 1	=	Marine Subtidal	R 3	=	Riverine Upper Perennial
M 2	=	Marine Intertidal	R 4	=	Riverine Intermittent
E 1	=	Estuarine Subtidal	L 1	=	Lacustrine Limnetic
E 2	=	Estuarine Intertidal	L 2	=	Lacustrine Littoral
R 1	=	Riverine Tidal	P	=	Palustrine
R 2	=	Riverine Lower Perennial	U	=	Upland

Classes (subclasses and modifers designated where appropriate):

AB	=	Aquatic Bed
BB	=	Beach/Bar
EM	=	Emergent Wetland
EMN6	=	Emergent Wetland, Regularly Flooded, Oligohaline
EMP6	=	Emergent Wetland, Irregularly Flooded, Oligohaline
EMR	=	Emergent Wetland, Seasonally Flooded-Tidal
FL	=	Flat
FO1	=	Forested Wetland, Broad-leaved Deciduous
FO2	=	Forested Wetland, Needle-leaved Deciduous
FO4	=	Forested Wetland, Needle-leaved Evergreen
OW	=	Open Water/Unknown Bottom
SS1	=	Scrub=Shrub Wetland, Broad-leaved Deciduous
SS3	=	Scrub-Shrub Wetland, Broad-leaved Evergreen
SS4	=	Scrub-Shrub Wetland, Needle-leaved Evergreen
SS5	=	Scrub-Shrub Wetland, Dead
SS7	=	Scrub-Shrub Wetland, Evergreen

NATIONAL WETLANDS INVENTORY

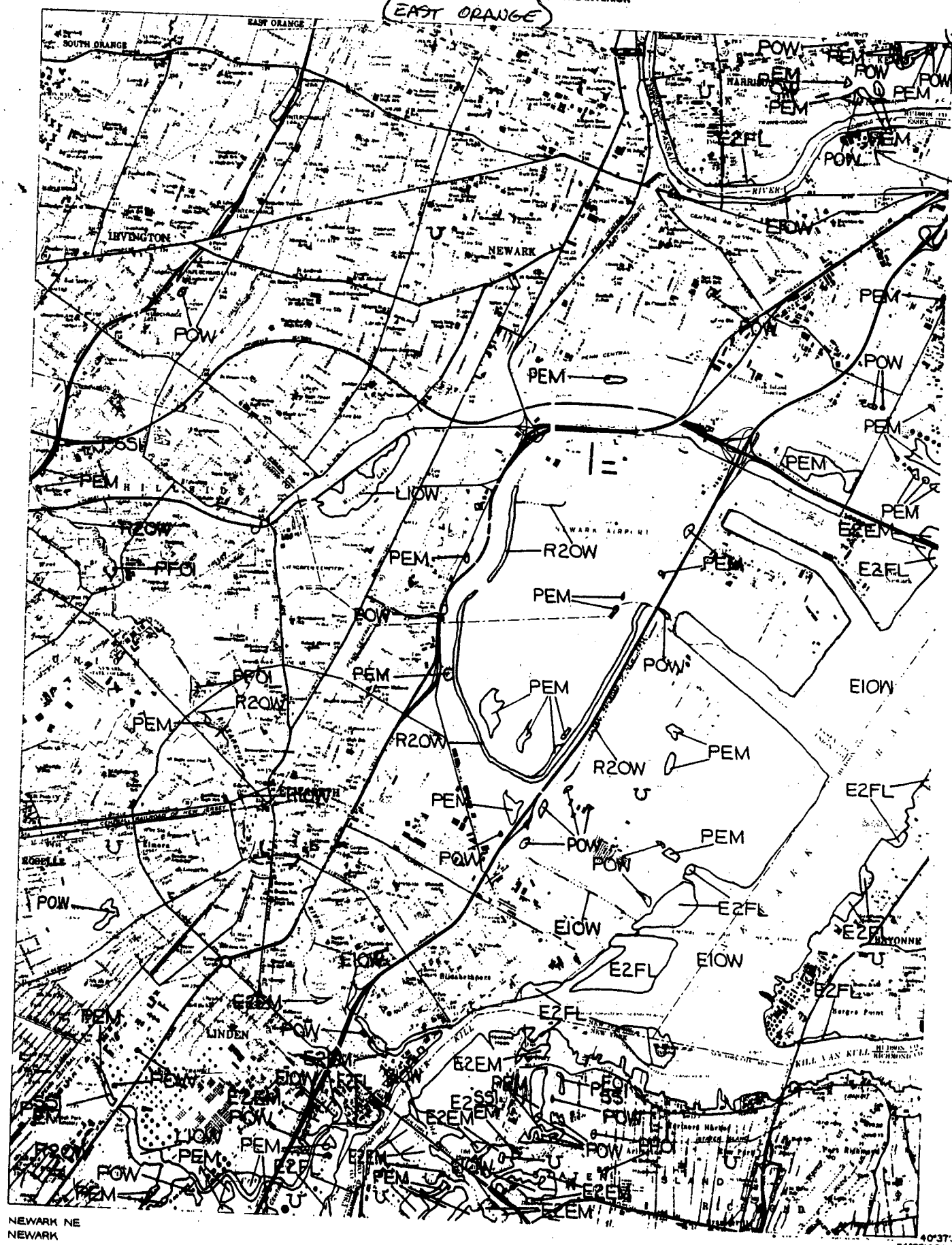
UNITED STATES DEPARTMENT OF THE INTERIOR

(EAST ORANGE)

(WEEHAWKEN)

SITE

(JERSEY CITY)



NEWARK NE
NEWARK

40°37'30"
74°07'30"

ELIZABETH, N.J.

175

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

(WEEHAWKEN)

NEWARK NE
NEWARK

74°00'

JERSEY CITY NJ

176

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

(WEEHAWKEN)

NEWARK NE
NEWARK

(ELIZABETH)

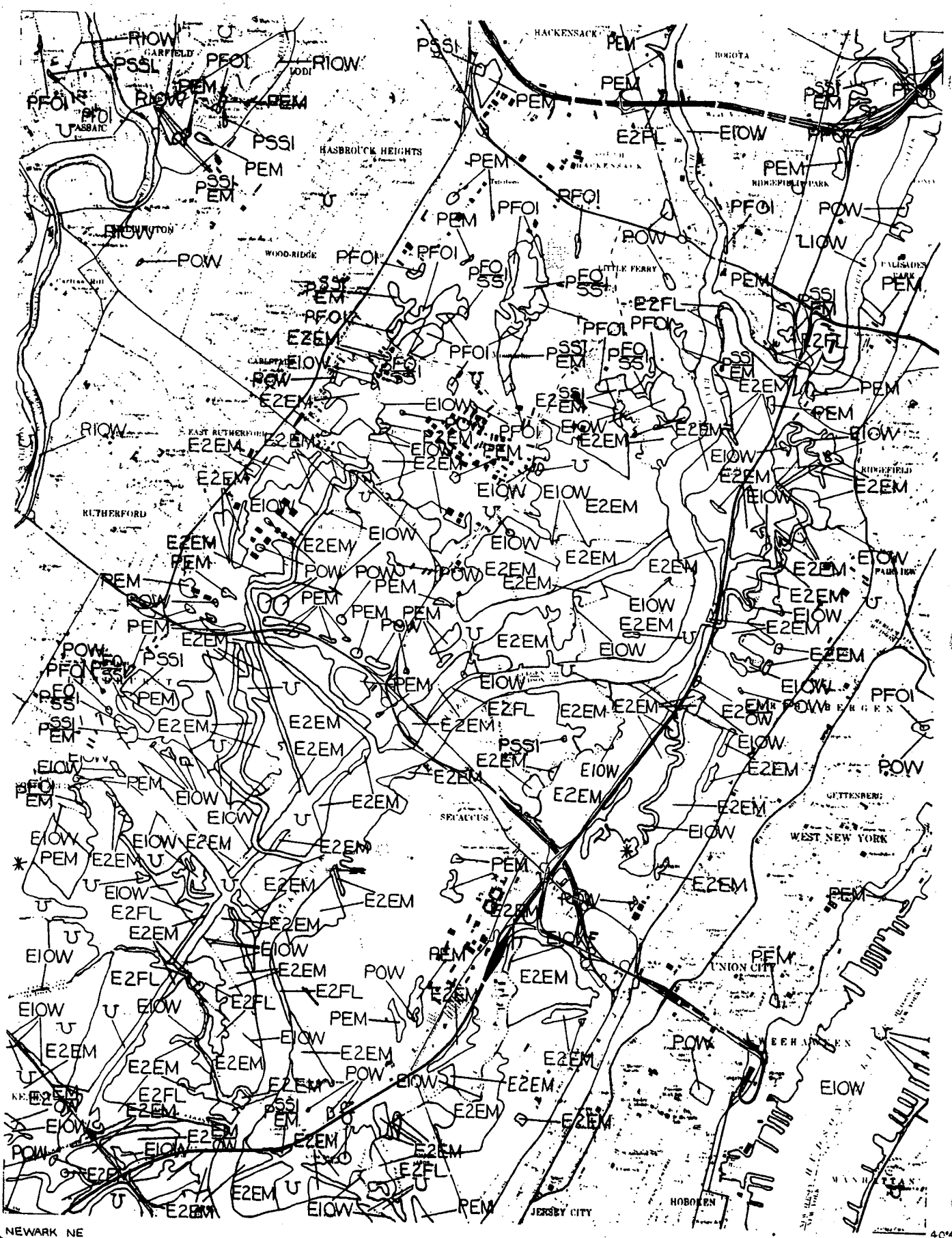
177

ORANGE, N.J.

(JERSEY CITY)

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR



(ORANGE)

(ELIZABETH)

(JERSEY CITY)

178

REFERENCE NO. 28

NUS CORPORATION TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8904-27	5-16-89	0845

DISTRIBUTION:

TO FILE - CELLOFILM CORPORATION

BETWEEN:	OF:	PHONE:
MR. AL RONALDSON - CONSTRUCTION OFFICER	U.S. NAVY	(718) 834-2242

AND: EDMUND KNYFD JR. (NUS)

DISCUSSION:

Mr. Ronaldson was not aware of any water well that the U.S. Navy might own in Newark, New Jersey.

Edmund Knyfd Jr. 5-16-89

ACTION ITEMS:

NUS 067 REVISED 0581

REFERENCE NO. 29

NUS CORPORATION TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8904-27	5-16-89	0900

DISTRIBUTION:

TO FILE - CELLOFILM CORPORATION

BETWEEN:	OF:	PHONE:
ED TIDEMAN ENGINEER	PASSAIC VALLEY SEWAGE COMMISSION (PVSC)	(201) 344-1800

AND: EDMUND KNYFD JR. (NUS)

DISCUSSION:

I asked Ed if the sanitary and storm sewers were seperate or combined in the area of the Cellofilm site. He said that (PVSC) has a sewer ~~back~~ (ex) branch that runs along Cornelia street and eventually goes to the PVSC sewage treatment plant. He said that Newark's sewers in that area may or may not tap into the PVSC branch; he suggested that I call the city of Newark sewer division for more definite information. Ed did say that he thought most of Newark had combined storm/sanitary sewer systems, but he had heard that parts of the "Ironbound" area of Newark (where Cellofilm is located) could have seperate storm and sanitary sewer systems.

ACTION ITEMS:

Edmund Knyfd Jr. 5-16-89

NUS 067 REVISED 0581

REFERENCE NO. 30

NUS CORPORATION TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8904-27	5-16-89	0915

DISTRIBUTION:

TO FILE - CELLOFILM CORPORATION

BETWEEN:	OF:	PHONE:
MR. ZAFAR - ENGINEER	CITY OF NEWARK SEWER DIVISION	(201) 733-8118

AND: EDMUND KNYFD JR. (NUS)

DISCUSSION:

I asked Mr. Zafar if the storm sewers along Albert Ave and Cornelia street were combined with the sanitary sewers. He said the two ~~were~~ are are seperate systems. The sanitary sewer line runs parallel to the Passaic Valley Sewage Commission (PVSC) sewer line and probably runs into the PVSC sewage plant. Mr. Zafar said that he thought the storm sewer did discharge into the Passaic River. From his information he thought the sewer line ran south of Cornelia street, under the N.J. Turnpike and then discharge into the Passaic River.

Edmund Knyfd Jr. 5-16-89

ACTION ITEMS:

NUS 067 REVISED 0581

REFERENCE NO. 31

NUS CORPORATION
SUPERFUND DIVISION

PROJECT NOTES

TO: CELLOFILM CORP. FILE

DATE: 5-16-89

FROM: EDMUND KNYFD JR.

COPIES:

SUBJECT: POTENTIAL FOR PUBLIC SUPPLY WELL CONTAMINATION

REFERENCE: TDD # 02-8904-27

This project note is to indicate that a potential ~~for~~ (EK) for public supply well contamination could exist in the site area. The New Jersey water supply overlay sheet #26 shows a public supply well at a map measured location of 26-22-334. It is believed that the well is owned by the U.S. Navy; however, Mr. Al Ronaldson of the U.S. Navy is not aware of any water wells that the Navy may own in Newark, New Jersey. It is not know, from available information, who owns this well, what the exact well location is, what the well is used for, how deep the well is, or what aquifer the well is set in. The following discrepancies have been observed:

- the well ~~may~~ might (EK) have been incorrectly located on the map.
- the well location ~~may~~ might (EK) have been listed incorrectly.
- The well location does not match up with any wells listed for map 26, block 22.

Edmund Knyfd Jr. 5-16-89

NUS 443A 58 1182

REFERENCE NO. 32

Hackensack River Symposium II
Sept. 13, 1988 F.D.U. Teaneck

FISHES OF THE LOWER HACKENSACK RIVER

A. BRETT BRAGIN

Hackensack Meadowlands Development Commission
One DeKorte Park Plaza
Lyndhurst, New Jersey 07071

INTRODUCTION

The Hackensack River originates in the Palisades near Haverstraw, New York and flows approximately south for some 50 miles to its mouth at Newark Bay (Kassner, 1971). In 1922 a 2.85 billion gallon reservoir was formed by a dam built above the head of tide at Oradell. This effectively separated the river into a controlled, freshwater area above, and an estuarine, brackish area below the dam (McCormick and Associates, 1977). The tidal portion of the river, from its confluence with Newark Bay to New Milford, New Jersey reaches some 22.5 miles and flows through heavily industrialized and populated Bergen and Hudson counties.

The Oradell Dam has severely restricted freshwater flow into the Hackensack River. At this time approximately 50% of the freshwater input is derived from precipitation, while treated sewage discharges account for approximately 30%, and the remainder is derived from the release of water held in the Oradell reservoir (Cheng and Konsevick, 1988). Three hundred years ago this system was a freshwater white cedar (*Chamaecyparis thyoides*) bog, but repeated attempts to drain the marshes by ditches and dikes, using the wetlands as a repository for solid waste, and municipal and industrial discharges have resulted in the present condition of the river and its surrounding wetlands (Kraus and Smith, 1988).

In order to improve the fishery resource knowledge of this estuary, the Hackensack Meadowlands Development Commission began collecting water quality and fisheries data in February 1987. Twenty one sampling sites were selected, based on habitat diversity and compatibility with fishing gear (Figure 1).

MATERIALS AND METHODS

Four different gear types were used. A 16 foot otter trawl (3/4 inch square body mesh, 5/8 inch square cod-end mesh, 1/4 inch mesh cod-end liner) was towed for 3 minutes at 2300 r.p.m. at 9 sites, with 2 repetitions per site. A 20 foot commercial Privateer with a 120 h.p. outboard motor was used for towing. Trawls were towed unbridled with 5/8 inch polydacron rope fastened to the transom of the vessel, and deployed with the vessel in forward motion, with tension on the tow ropes and against the prevailing surface current. A minimum 5:1 ratio of tow rope length to station depth was maintained. The net was retrieved by hand.

A 60 foot long by 6 foot high by 1/4 inch bag seine was used at 3 sites. The seine was walked through the water in a semi-circular pattern against the shoreline.

A 200 foot long by 8 foot high experimental sinking gill net consisting of four 50 foot panels of 3/4 inch, 1 3/4 inch, 3 1/2 inch, and 4 inch square mesh was used at 3 sites. It was deployed with cinder blocks attached to both leadlines and two bouys attached to the blocks for marking. Sets were fished for approximately 24 hours.

The "lower" and "middle" zones of the river proved similar in terms of the number of species and fish groups found. The salinities here are in the mesohaline range (18.0 to 5.0 0/00). The "upper" zone differs from the others in terms of number and groups of fish species, as well as salinity. Salinity here is oligohaline (5.0 to 0.5 0/00). In general the mesohaline zone exists from River Mile (RM) 0-10 (the mouth of the river to Cromakill Creek), the oligohaline zone from RM 10-16 (Cromakill Creek to just upriver of Hackensack) and the tidal freshwater zone from RM 16 to Oradell Dam. The freshwater segment is the longest generally during winter and spring, due to rain, snow and ice melt, and it shrinks in summer and autumn, during periods of low freshwater input and increased evaporation. As the freshwater segment shrinks, the meso- and oligohaline segments expand upstream, at times upriver to the dam (P.S.E.&G., 1988). Further upstream, outside of the Hackensack Meadowlands District, we would have encountered an increasingly freshwater system and fish community.

CONCLUSIONS

The Hackensack River and its associated wetlands have been greatly impacted by man. Construction of a dam at Oradell has greatly altered the original river hydrology, and consequently it no longer functions as a "normal" estuarine river. It is now essentially a canal, open fully only at the end adjacent to Newark Bay. Although the river is not fishable due to restrictions imposed by the New Jersey Department of Environmental Protection, this estuary is a refuge and nursery area for several important commercial and recreational species, such as striped bass, Atlantic menhaden, weakfish, winter flounder, alewife, and blueback herring, and for two species listed threatened by the State of New Jersey, the Atlantic tomcod and American shad. Contrary to the misconception that the Hackensack River is "dead", our data show that the river is very much alive and supports moderately diverse fish and invertebrate communities.

LITERATURE CITED

Cheng, C. and E. Konsevick. 1988. Trends in the water quality of an urban estuary: Hackensack Meadowlands, N.J. Proceedings of the Symposium on Coastal Water Resources. AWRA, TPS-88-1: 147-154.

Kasner, J. J. and Co. 1971. Feasibility report, water pollution control systems in connection with the development of the Hackensack Meadowlands, Bergen and Hudson counties. Prepared for State of New Jersey, Hackensack Meadowlands Development Commission. 148pp.

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Reference 7

PROJECT NOTE **REGION II SITE ASSESSMENT TEAM**

To: Cellofilm Corporation File **Date: April 1, 2004** **Page:** 1 of 19

From: Michele Capriglione, Region II SAT

Subject: Groundwater Population

REFERENCES

Attachment A - New Jersey Geological Survey, PSW 2000 Public Supply Well Inventory, Search Radius: 21,120 feet, accessed on 1 April 2004.

Attachment B - U.S. Geological Survey, 4-Mile Radius Well Inventory for Geographic Coordinates 40° 44′ 12″ N and 74° 08′ 15″ W.

Based upon information obtained from the above references, M. Capriglione determined that there are no drinking water wells currently in use within 4 miles of the Cellofilm Corporation site. The majority of wells in use within the target distance limit of the Cellofilm Corporation are used for industrial cooling processes.

Michele Capriglione

Michele Capriglione

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Attachment A

PSW.DAT revision: 643984 04/21/99 3:52P
Search conducted: 04-01-2004 10:12:17 Search radius: 21120 feet
Chosen search parameters were NAD83 geographic coordinates
Location entered: Latitude: 40ø44'12" Longitude: 74ø8'15"
Easting: 592574.389 Northing: 693470.295

End of search; 0 wells found.

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Attachment B

Project Number	Site ID (station number)	Local well number	County code	Municipality	Aquifer code	Well depth	Depth to top of open interval	Depth to bottom of open interval	Casing Material	Latitude	Longitude	Lat/long datum	Use of site	Use of water	NJDEP Permit Number
C005	C001	C012	C008	C013	C714	C028	C083	C084	C080	C009	C010	C036	C023	C024	C213
130016	404353074080001	ABLON 1	013	NEWARK CITY	227BRCKS	500	86	500		404353	0740800	NAD27	W	N	26-02141
130017	404401074083401	BALLANTINE 8 OBS	013	NEWARK CITY	227PSSC	875	95	875		404401	0740834	NAD27	O	U	
130087	404352074081101	29646	013	NEWARK CITY	227BRCKS	165	90	165	S	404352	0740811	NAD27	W	N	26-04993
130088	404622074111001	STANDBY WELL	013	NEWARK CITY	227BRCKS	354	52	354	S	404622	0741110	NAD27	W	T	26-04664
130140	404700074090001	ISP 1	013	BELLEVILLE TOWN	227PSSC	352				404700	0740900	NAD27	W	N	46-00092
130141	404700074090002	ISP 2	013	BELLEVILLE TOWN	227PSSC	400				404700	0740900	NAD27	W	N	46-00093
130145	404647074092701	HIDES WASHING 2	013	NEWARK CITY	227PSSC	300				404647	0740927	NAD27	W	C	46-00160
130146	404647074092702	HIDES WASHING 3	013	NEWARK CITY	227PSSC	250				404647	0740927	NAD27	W	C	46-00161
130147	404647074092703	HIDES WASHING 4	013	NEWARK CITY	227PSSC	200				404647	0740927	NAD27	W	C	46-00162
130163	404703074090001	VAN DYKE 3	013	BELLEVILLE TOWN	227PSSC	400	86	400	S	404703	0740900	NAD27	W	N	26-05113
130170	404255074103001	NEWARK WAREHOUSE 1	013	NEWARK CITY	227PSSC	800				404255	0741030	NAD27	W	N	46-38537
130171	404434074122801	FAIRMOUNT CEMETARY 1	013	NEWARK CITY	227PSSC	635				404434	0741228	NAD27	W	I	46-37060
130172	404633074093001	HIDES WASHING 5	013	NEWARK CITY	227PSSC	440	73	440	S	404633	0740930	NAD27	W	N	26-04969
170006	404614074082201	SWENSON 1	017	KEARNY TOWN	227BRCKS	400	49	400	S	404614	0740822	NAD27	W	N	26-02717
170007	404506074083801	HONEYCOMB 1	017	KEARNY TOWN	227PSSC	500				404506	0740838	NAD27	W	J	46-00182
170008	404446074083801	KARLSHAMNS NORTH	017	KEARNY TOWN	227PSSC	584	110	584	S	404446	0740838	NAD27	W	N	26-04523
170009	404508074084701	KOTOW 2	017	KEARNY TOWN	227PSSC	700	290	700	S	404508	0740847	NAD27	W	N	26-02384
170010	404604074080401	PFAFF 1	017	KEARNY TOWN	227PSSC	590	54	590	S	404604	0740804	NAD27	W	N	26-02162
170011	404422074092901	ALLOYS 2	017	HARRISON TOWN	227PSSC	257	234.5	253		404422	0740929	NAD27	W	N	46-47336

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2.6.2.4 METHOD OF CONSTRUCTION
** (CDCOME/C65 - CHAR X in 57):

Enter the code that best indicates the method by which the site was constructed. Allowable codes are:

A - air-rotary
B - bored or augered
C - cable-tool
D - dug
H - hydraulic rotary
J - jetted
P - air percussion
R - reverse rotary
T - trenching
V - driven
W - drive and wash
Z - other (explain in remarks)

(A) Air-rotary method is one in which a stream of air is used to cool the bit and bring the rock cuttings to the surface.

(B) A bored or augered hole is one in which the earth materials are cut and removed from the hole with an auger. The auger may be powered by hand or machinery.

(C) Cable-tool refers to a well drilled by the familiar "percussion" or "churn-drill" method whereby a heavy drilling tool is raised and lowered with enough force to pulverize the rock. The rock debris is commonly removed from the hole with a bailer. The California mud-scow method is a special variation of the cable-tool method.

(D) Dug holes are excavated by hand tools or power-driven digging equipment. Caissons, Ranney-type collectors, and galleries belong in this classification even though they may have laterals that are driven or jetted. Tunnels would also be in this category.

(H) The hydraulic-rotary well is constructed by rotating a length of pipe (drill stem) equipped with a bit that cuts or grinds the rocks. Water or drilling mud is pumped down the drilling stem. Cuttings are carried to the surface in the annular space between the drilling stem and the wall of the hole. Note that separate categories are provided for air-rotary and reverse-rotary.

Loam	LOAM
Loess	LOSS
Marble	MRBL
Marl	MARL
Marlstone	MRLS
Metamorphis (undifferentiated)	MMPC
Muck	MUCK
Mud	MUD
Mudstone	MDSN
Other	OTHR
Outwash	OTSH
Overburden	OBDN
Peat	PEAT
Quartzite	QRTZ
Residium	RSDM
Rhyolite	RYLT
Rock	ROCK
Rubble	RBBL
Sand	SAND
Sand and clay	SDCL
Sand and gravel	SDGL
Sand and silt	SDST
Sand, gravel, and clay	SGVC
Sand, some clay	SNCL
Sandstone	SNDS
Sandstone and shale	SDSL
Saprolite	SPRL
Schist	SCST
Sedimentary (undifferentiated)	SDMN
Serpentine	SRPN
Shale	SHLE
Silt	SILT
Silt and clay	STCL
Siltstone	SLSN
Slate	SLTE
Soil	SOIL
Syenite	SYNT
Till	TILL
Travertine	TRVR
Tuff	TUFF
Volcanic (undifferentiated)	VLCC

6.7.1.4 LITHOLOGY

** (LGLITH/C96 - SECONDARY-KEY CHAR X(4) in 63-66):

Enter the code indicating the principal lithology of this unit. The codes are:

Rock Term	Abbreviation
Alluvimum	ALVM
Anhydrite	ANDR
Anorthosite	ANRS
Arkose	ARKS
Basalt	BSLT
Bentonite	BNTN
Boulders	BLDR
Boulders and sand	BLSD
Boulders, silt, and clay	BLSC
Breccia	BRCC
Calcite	CLCT
Caliche (hard pan)	CLCH
Chalk	CHLK
Chert	CHRT
Clay	CLAY
Clay, some sand	CLSD
Claystone	CLSN
Coal	COAL
Cobbles	COBB
Cobbles and sand	COSD
Cobbles, silt, and clay	COSC
Colluvium	CLVM
Conglomerate	CGLM
Coquina	CQUN
Diabase	DIBS
Diorite	DORT
Dolomite	DLMT
Drift	DRFT
Evaporite	EVPR
Gabbro	GBBR
Glacial (undifferentiated)	GLCL
Gneiss	GNSS
Granite	GRNT
Granite, gneiss	GRGN
Gravel	GRVL
Gravel and Clay	GRCL
Gravel, cemented	GRCM
Gravel, sand, and silt	GRDS
Gravel, silt and clay	GRSC
Graywacke	GRCK
Greenstone	GNST
Gypsum	GPSM
Hard pan	HRDP
Igneous (undifferentiated)	IGNS
Lignite	LGNT
Limestone	LMSN
Limestone and Dolomite	LMDM

364NMKL NORMANSKILL FORMATION
364ODVCMORDOVICIAN, MIDDLE
364SKHL SNAKE HILL FORMATION
364TBRV TRENTON-BLACK RIVER GROUP
364TRNN TRENTON GROUP
364WLMC WALLOOMSAC SLATE
367BKMN BEEKMANTOWN GROUP
367ODVCLORDOVICIAN, LOWER
367PLTN POULTNEY SLATE
367TBHL TRIBES HILL LIMESTONE
370CMBR CAMBRIAN SYSTEM
371CMBRMMIDDLE CAMBRIAN SERIES
371CMBRUCAMBRIAN, UPPER
371LLFL LITTLE FALLS DOLOMITE
371PSDM POTSDAM SANDSTONE
371TCSQ TACONIC SEQUENCE
371THRS THERESA DOLOMITE
374CMBRMCAMBRIAN, MIDDLE
374SKBG STOCKBRIDGE GROUP
377BULL BULL SLATE
377CMBRLLOWER CAMBRIAN SERIES
377DLTN DALTON FORMATION
377EZVB ELIZAVILLE AND BERKSHIRE FORMATIONS
377NSSU NASSAU FORMATION
377PGQY POUGHQUAY QUARTZITE
377SCCK SCHODACK FORMATION
377SSNG STISSING DOLOMITE
400BCPX BASEMENT COMPLEX
400PCMB PRECAMBRIAN ERATHEM

211RCNF RARITAN CONFINING UNIT
211RRTN RARITAN FORMATION
230TRSC TRIASSIC SYSTEM
231BRCK BRUNSWICK FORMATION
231NWRK NEWARK GROUP
231PLSD PALISADE DIABASE
231STCN STOCKTON FORMATION
231TRSCUUPPER TRIASSIC SERIES
300PLZC PALEOZOIC ERATHEM
320PSLV PENNSYLVANIAN SYSTEM
324PSVL POTTSVILLE FORMATION
330MSSP MISSISSIPPIAN SYSTEM
337POCN POCONO GROUP
340DVNN DEVONIAN SYSTEM
341CNDY CANADAWAY GROUP
341CNNG CONEWANGO GROUP
341CNNT CONNEAUT GROUP
341DVNNUDEVONIAN, UPPER
341GENS GENESEE FORMATION
341JVWF JAVA-WEST FALLS FORMATION
341SONY SONYEA FORMATION
344DVNNMDEVONIAN, MIDDLE
344ESPS ESOPUS SHALE
344HMLN HAMILTON GROUP
344ONDG ONONDAGA LIMESTONE
344TLLY TULLY LIMESTONE
347DVNNLDEVONIAN, LOWER
347HDBG HELDERBERG GROUP
347ORSK ORISKANY SANDSTONE
350GRPD GREEN POND CONGLOMERATE
350SLRN SILURIAN SYSTEM
351ACBB AKRON-COBLESVILLE-BERTIE FORMATIONS,UNDIFFERENTIATED
351AKRN AKRON DOLOMITE
351BNTR BINNEWATER SANDSTONE
351BRTI BERTIE LIMESTONE
351CBLK COBLESKILL LIMESTONE
351CMLS CAMILLUS SHALE
351LNGD LONGWOOD SHALE
351SLIN SALINA GROUP
351SLRNUSILURIAN, UPPER
351SRCS SYRACUSE SALT
351VRNN VERNON SHALE
354CLNN CLINTON GROUP
354SLRNMSILURIAN, MIDDLE
354SNGK SHAWANGUNK CONGLOMERATE
355LCKP LOCKPORT DOLOMITE
357ALBN ALBION GROUP
357SLRNLSILURIAN, LOWER
360ODVC ORDOVICIAN SYSTEM
361LRRN LORRAINE SHALE
361ODVCUORDOVICIAN, UPPER
361OSWG OSWEGO SANDSTONE
361QNSN QUEENSTON SHALE
361UTIC UTICA SHALE
364BRKR BERKSHIRE SCHIST
364CHZY CHAZY GROUP
364CNJR CANAJOHARIE SHALE

6.7.1.3 UNIT IDENTIFIER

** (LGAQFR/C93 - MANDATORY SECONDARY-KEY CHAR X(8) in 55-62): Enter the 8-character code identifying the lithologic unit (see app. F). (The terms BASEMENT and BEDROCK will be accepted as legal values.) The unit identifier is mandatory.

100CNZC CENOZOIC ERATHEM
110QRNR QUATERNARY SYSTEM
111ALVM HOLOCENE ALLUVIUM
111BBTM BAY-BOTTOM DEPOSITS
111BECH BEACH DEPOSITS
111DUNE DUNE (AEOLIAN) DEPOSITS
111FILL FILL
111HLCN HOLOCENE SERIES
111LAKE LAKE DEPOSITS
111SLMR SALT-MARSH DEPOSITS
111TRRC TERRACE DEPOSITS
11220CL 20-FOOT CLAY
112GLCD GLACIAL DELTA DEPOSITS
112GLCLU GLACIAL AQUIFER,UPPER
112GRDR GARDINERS CLAY
112HBHD HARBOR HILL DRIFT
112HBHO HARBOR HILL OUTWASH
112HBHT HARBOR HILL TILL
112HHGM HARBOR HILL GROUND MORAINE
112HHTM HARBOR HILL TERMINAL MORAINE
112ICNC ICE-CONTACT DEPOSITS
112JMCO JAMECO AQUIFER
112KMTC KAME TERRACE DEPOSITS
112LAKE LAKE DEPOSITS
112OTSH OUTWASH
112PGFG PORT WASHINGTON CONFINING UNIT
112PGQF PORT WASHINGTON AQUIFER
112RKGM RONKONKOMA GROUND MORAINE
112RKKD RONKONKOMA DRIFT
112RKKO RONKONKOMA OUTWASH
112RKKT RONKONKOMA TILL
112RKTM RONKONKOMA TERMINAL MORAINE
112SAND SAND
112SDGV SAND AND GRAVEL
112SMTN SMITHTOWN CLAY
112TILL TILL
121MNNT MANNETTO GRAVEL
200MSZC MESOZOIC ERATHEM
210CRCS CRETACEOUS SYSTEM
211CRCSUUPPER CRETACEOUS SERIES
211LLYD LLOYD AQUIFER
211MGTY MAGOTHY AQUIFER
211MMGD MONMOUTH GREENSAND
211MNMG MATAWAN GROUP-MAGOTHY FORMATION
211MNMT MONMOUTH GROUP
211MNMT MONMOUTH GROUP
211MTWN MATAWAN FORMATION

dewater-
discharged

ing should be indicated even though the water may be into an irrigation ditch and subsequently used to irrigate land.

type (E) Power generation refers to use of water for generation of any of power.

and (F) Fire protection refers to the principal use of the water should be indicated if the site was constructed principally for this purpose even though the water may be used at times to supple- ment an industrial or defense supply, to irrigate a golf course, fill a swimming pool, or for other use.

principally (H) Domestic use is water used to supply household needs, for drinking, cooking, washing, and sanitary purposes, but includ- ing watering a lawn and caring for a few pets. Most domestic wells will be at suburban or farm homes, but wells supplying small quantities of water for domestic purposes for one- classroom schools, turnpike gates, and similar installations, should be in the domestic category.

cultivated (I) Irrigation refers to the use of water to irrigate crops, plants. Most irrigation sites will supply water for farm of but the category should include wells used to water the grounds small schools, industrial plants, or cemeteries, if more than a amount of water is pumped and that is the sole use of the water.

in- (J) Industrial (cooling) refers to a water supply used solely for dustrial cooling.

(K) Mining refers to a water supply used solely for mining purposes.

value. (M) Medicinal refers to water purported to have therapeutic Water may be used for bathing and/or drinking. If use of water is mainly because of its claimed therapeutic value, use this category even though the water is bottled.

1.41 USE OF WATER
** (SWUSE1/C24 - SECONDARY-KEY CHAR X in 413):

Enter the code indicating the principal use of water from the site. If water from the site is used for more than one purpose, enter the principal use here and enter the subordinate uses in the following two fields. The codes and their meanings are:

A - air conditioning	I - irrigation	R - recreation
B - bottling	J - industrial (cooling)	S - stock
C - commercial	K - mining	T - institution
D - dewater	M - medicinal	U - unused
E - power	N - industrial	Y - desalination
F - fire	P - public supply	Z - other (explain in remarks)
H - domestic	Q - aquaculture	

(A) Air conditioning refers to water supply used solely or principally for heating or cooling a building. Water used to cool industrial machinery belongs in the industrial category, not in the air-conditioning category.

(B) Bottling refers to the storage of water in bottles and use of the water for potable purposes (see Medicinal).

(C) Commercial use refers to use by a business establishment that does not fabricate or produce a product. Filling stations and motels are examples of commercial establishments. If some product is manufactured, assembled, remodeled, or otherwise fabricated, use of water for that plant should be considered industrial, even though the water is not used directly in the product or in the manufacturing of the product.

(D) Dewatering means the water is pumped for dewatering a construction or mining site, or to lower the water table for agricultural purposes. In this respect, it differs from a drainage well that is used to drain surface water underground. If the main purpose for which the water is withdrawn is to provide drainage,

water (J) Jetted wells are excavated by using high velocity streams of "jetting" pumped through a pipe having a restricted opening or at- nozzle. For some types of earth materials a cutting bit is washed tached to the end of the jetting pipe. The material cut or out- from the hole is carried to the surface in the annular space is side the pipe as by the hydraulic-rotary method. This method uncon- most suitable for construction of small-diameter wells in solidated material.

compressed (P) An air-percussion drill is a cutting tool powered by ac- air. It uses a rapid percussion effect, coupled with rotary blow tion, to drill hard rocks. Compressed air also is used to generally the cuttings from the hole. Air-percussion drills are used in conjunction with air-rotary drilling rigs.

the (R) Reverse rotary is similar to the hydraulic rotary except that the water or drilling mud flows down the annular space between the drilling stem and the wall of the hole and the cuttings are pumped out through the drill stem.

from (T) Trenching refers to the construction of a sump or open pit hand which ground water may be pumped. Trenching may be done by dragline but more commonly power equipment, such as a bulldozer, in power shovel, or a backhoe is used. Ponds and drains belong this category of construction.

usually (V) Driven wells are constructed by driving a length of pipe, the of small diameter and generally equipped with a sand point, to hammer desired depth. The wells may be driven by hand or with air well or other power equipment. An essential feature of a driven is that no earth material is removed as the well is constructed.

diameter (W) Drive and wash wells are constructed by driving a small

the open-end casing a few feet into the earth, then washing out material from inside the casing with a jet of water. The process is repeated until the well has penetrated a sufficient depth into the aquifer.

of

well, the purposes described above. A test hole, oil or gas

in recharge, drainage, observation, or waste-disposal well will be this category.

stock, Do not use this classification for an irrigation, domestic,

nonuse. or other well during 'off season' or temporary periods of

con- The use of water from a newly constructed site should be

not sidered as the use for which it is intended even though it may yet be in use when inventoried.

(Y) Desalination refers to water used in a desalting process

whereby dissolved solids are removed to make water potable or suitable

for other uses. Enter the type of use of the desalinated water in

the next column, "Secondary Water Use".

(Z) Other refers to miscellaneous uses not included in the

listed categories.

(N) Industrial use is within a plant that manufactures or fabricates a product. The water may or may not be incorporated into the product being manufactured. Industrial water may be used to cool machinery, to provide sanitary facilities for employees, to air-condition the plant, and to irrigate the ground at the plant.

(P) Public Supply use is water that is pumped and distributed to several homes. Such supplies may be owned by a municipality or community, a water district, or a private concern. In most States, public supplies are regulated by departments of health which enforce minimum safety and sanitary requirements. If the system supplies five or more homes, it should be considered a public supply, as four or less classify use as domestic. Water supplies for trailer or summer camps with five or more living units should be in this category, but motels and hotels are clas-sified as commercial. Most public supply systems also furnish water for a variety of other uses, such as industrial, institu-tional, and commercial.

(Q) Aquaculture refers to a water supply used solely for aquaculture, such as fish farms.

(R) Recreation refers to water discharged into pools, or channels which are dammed downstream to form pools, for swimming, boating, fishing, ice rinks, and other recreational uses.

(S) Stock Supply refers to the watering of livestock.

(T) Institutional refers to water used in the maintenance and opera-tion of institutions such as large schools, universities, hospitals, rest homes, or similar installations. Owners of in-stitutions may be individuals, corporations, churches, or governmental units.

(U) Unused means water is not being removed from the site for one

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2.6.2.5 TYPE OF FINISH
** (CDCOFI/C66 - CHAR X in 58):

Enter the code indicating the method of finish or the nature of the openings that allow water to enter the well. Allowable codes are:

C - porous concrete
F - gravel pack w/perforations
G - gravel pack w/screen
H - horizontal gallery
O - open end
P - perforated or slotted
S - screen
T - sand point
W - walled
X - open hole
Z - other (explain in remarks)

(C) Porous concrete is concrete casing that is pervious enough to allow ground water to seep into the well.

(F & G) A gravel pack well is a drilled or dug well that has a gravel envelope opposite the part through which water enters. Commonly, these wells will be finished either with commercial screen or with slotted casing.

(H) A horizontal gallery or collector essentially is a horizontal type well in which the screen, slotted pipe, or gravel-filled trench is horizontal. All horizontal wells should be in this class, including Ranney collectors and infiltration galleries.

(O) An open-end well is one that is cased to the bottom of the hole so that water can enter the well only through the bottom of the hole.

(P) Perforated or slotted casing is well pipe that has had holes punched or slots cut in it to admit water. Do not use this designation if the well has a gravel pack. Use "F" instead.

(S) Screen refers to commercial well screen manufactured for the purpose of admitting water to a well. Common types of screen are wire mesh, wrapped trapezoidal wire, and shutter screen. Do not use this designation if the well also has a gravel pack. Use "G" instead.

(T) A sand point is the screen part of a drive point and usually

is part of a driven well.

(W) A walled or shored well is usually a dug well in which the walls have been shored-up with open-jointed fieldstore, brick, tile, concrete blocks, wood cribbing, or other material. A few wells of this type may have gravel walls, however, they should be placed in this category instead of F or G. A dug well that is mostly open hole but has even a few feet of cribbing, corrugated pipe, or other shoring to prevent caving, should be in this category.

(X) An open hole well is one that has a finished open hole in the aquifer. A well belongs in this class even if the casing does not actually extend to the geologic unit or zone from which the water is obtained.

Reference 8

PROJECT NOTE **REGION II SITE ASSESSMENT TEAM**

To: Cellofilm Corporation File **Date**: 31 March 2004 **Page**: 1 of 75

From: Michele Capriglione

Subject: Population Within 4 Miles of the Cellofilm Corporation site

Attached to this note documents the resident population within 4 miles of the Cellofilm Corporation site. The information was accessed on 31 March 2004 from MABLE/Geocorr Geographic Correspondence Engine with Census 2000 Geography. The search engine is provided in conjunction with the U.S. Census Bureau. Population numbers are accessed by entering the geographic coordinates of the site in decimal degrees and specifying desired radii values. Attached are the summary sheets generated by the using the program.

Distance Ring (miles)	Population
0 - 0.25	486
0.25 - 0.50	3,855
0.50 - 1.0	11,568
1.0 - 2.0	68,877
2.0 - 3.0	112,818
3.0 - 4.0	253,168

Total = 450,772

Signature Michele Capriglione

Michele Capriglione

MABLE/Geocorr2*K*: Geographic Correspondence Engine with Census 2000 Geography

Version 1.1 (Aug, 2003)

Accesses the MABLE2k data base with 2000 (and later) geographic codes. Generates "correlation list" reports / files.

Links: What's new | Previous Version | Direct access mable2k

Note: Help and **Examples** pages have not been updated for the new 2k version but you can still access the original 1990 versions. *Most* of what was true then is still true now.

This form has 5 main sections. Only the first 2 are required.

Input | Output | Geographic Filter | Point & Distance | Bounding Box

---

Input Options

Select state(s) to process.

Missouri
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District Of Columbia

For background information and help with any of the geographic codes used in the MABLE database (source/target geocodes) consult the file:

MAGGOT

(Master Area Geographic Glossary Of Terms)

Select 1 or more "SOURCE" Geocode(s)

Entire Universe [no code]
State (2000)
County (2000)
County Subdivision: MCD (2000)
Place: City, Town, Village, etc. (2000)
Census Tract (2000)
Census Block Group (2000)
Census Block (2000)(+)
5-digit ZCTA (ZIP Census Tab. Area 2000)

Concentric Ring Pseudo-Geocode (*)
Urban-Rural Portion (2000)
Urbanized Area/Urban Cluster (2000)
PUMA for 5 Pct Samples (2000)
Metro Area: MSA or CMSA (2000)

Select 1 or more "TARGET" Geocode(s)

Entire Universe [no code]
State (2000)
County (2000)
County Subdivision: MCD (2000)
Place: City, Town, Village, etc. (2000)
Census Tract (2000)
Census Block Group (2000)
Census Block (2000)(+)
5-digit ZCTA (ZIP Census Tab. Area 2000)

Concentric Ring Pseudo-Geocode (*)
Urban-Rural Portion (2000)
Urbanized Area/Urban Cluster (2000)
PUMA for 5 Pct Samples (2000)
Metro Area: MSA or CMSA (2000)

Notes:

+ If you chose census block then you may not choose more than 10 states.

* If you chose "Concentric Ring Pseudo-Geocode" from either list (above) then you **must** specify the "Point and Distance" **or** "Ring Geocode" options below.

hting Variable:

Specify variable to use for determining the portion of the source geocodes corresponding to the target geocodes:

☐ Ignore Census Blocks with a value of 0 for the weighting variable.

Population (2000 census)
Land Area (square miles)
Housing Units (2000 census)

Output Options

☐ Have weighted centroids calculated and kept on the output file(s)

☐ Generate 2nd allocation factor (AFACT2): portion of *target* geocodes in *source* geocodes

☐ Sort by target geocodes, then source geocodes (default is by source, then target)

You have your choice of 2 output formats: a comma-separated-value (".csv") file **and/or** a report format ("listing") file. For each file you can specify whether you want just the geographic codes, or the codes *and* the names associated with them (where applicable), or just the names.

Comma Separated Value File

☑ Generate a CSV file ☐ Use tabs as delimiter

Just Codes (No Names)
Codes and Names
Just Names (No Codes)

Listing File

☑ Generate a listing file Format: Plain text

Just Codes (No Names)
Codes and Names
Just Names (No Codes)

(Optional) Title for output report:

Reset Defaults | Run Request **Processing time for large areas may be several minutes.**

Geographic Filtering Options

VOTE: This secion allows you to specify options that will limit the geographic universe to be processed. If you just want o process the entire state(s) that you have selected then you can ignore this section.
'ou can specify any or all of 4 types of geography to limit the universe to be processed. You may, for example, only wan o see a file with geography for a set of counties, or for a specific metro area (or areas), or possibly for a city (place). You an do so by entering the appropriate FIPS (Federal Information Processing Standard) codes in the text entry boxes that ollow. If you need to "look up" the codes you can click on the links to the code-list files in each section.

3y default, if you specify more than one kind of geography here then the application assumes that you want to "and" the elections, keeping only areas that satisfy all criteria. For example, if you specified three counties and a metro area, you vould only get data based on blocks that were in **both** the counties and the metro area (i.e. the intersection of the selected reas.) To override this default and choose geographies that satisfy *any* (rather than *all*) of your select criteria -- **clic ere:** ☐

All selections made below are in addition to the state-level or distance-based filtering which you specify

ounty codes . Enter 5-digit FIPS county codes with leading zeroes separated by blanks. You may enter 3-digit codes if ou selected only one state. Your output will be limited to the counties specified.
xamples:

- 29189 29510 17163 17119 (selects 4 counties in 2 states)
- 005 017 049 (selects 3 counties from the single state selected)

etro Area codes. Enter 4-digit FIPS metro area codes with leading zeroes separated by blanks. MSA, CMSA and PMSA odes may be used (4-digit only). The 1990 definitions will be used. Your output will be limited to the metro areas pecified. New England NECMA codes can **not** be used.
code of 9999 can be entered to select non-metro areas (alone or as part of a list of metro area codes). **Enter *-9999* to pecify that you want to exclude all non-metro areas**. The -9999 code must be entered as the entire value for the list.
xamples:

- 3760 1602 (Selects Kansas City MSA and Chicago CMSA)
- -9999 (Selects only areas that are within a metro area)

rbanized Area and Urban Clusters . Enter 5-digit FIPS urbanized area or urban cluster codes with leading zeroes eparated by blanks. Your output will be limited to the UA/UC areas (which are mutually exclusive) specified. **Enter -*999* to specify that you want to exclude all non-urban areas**. The -9999 code must be entered as the entire value for e list. Examples:

- 00415 02062 (Selects the Ada, OK Urban Cluster and the Ann Arbor, MI Urbanized Area. Only works if you have also selected the appropriate 2 states).
- -9999 (Selects only areas that are non-urban, using the new 2000 census definition)

lace codes. Enter 7-digit FIPS place codes with leading zeroes separated by blanks. You can enter 5-digit codes if only ne state has been selected. Your output will be limited to the official city limits of these cities as of the 2000 census. nter a value of *-9999* to indicate that you want to exclude all areas that are not inside any place. You will get all areas at are either incorporated or within a Census Designated Place.
xamples:

- 70520 70545 70550 53780 06020
  (Saginaw City, Saginaw Township North and South, Midland, Bay City, MI)
- -9999
  You will get output that excludes any geographic area not included within a place.

ternal use only (ignore): 0

Reset Defaults | Run Request

Point-and-Distance Options

y a point (location) and distance to be used as filter:

alue for radius of Circle **or** radius of largest Ring: 4 (In miles, unless you check ☐ here to specify kilometers.)

See just below for links to help find coordinates.)

:oordinates of Point: 40.736664 degrees latitude, 74.137465 degrees longitude.

.abel of Point: (optional)

)efine Ring criteria specifying only one of the following two options:

:ither: # of equi-distant rings (integer value between 1 and 10). Radius specified above will be divided by th lerive width of each Ring.

)r: Specify your own custom list of up to 10 ring radii values in ascending order (values must be greater than zero, may e fractional, and largest should equal the radius of the Circle specified above):

#1 .25 #2 .50 #3 1 #4 2 #5 3
#6 4 #7 #8 #9 #10

.inks are provided here to facilitate obtaining coordinates for your location. See the HELP file for more detailed ıformation.

'ip: Suggest right-clicking these links and choosing the "Open in New Window" option. This makes it easier and faster t ut and paste coordinates.

- The ETAK Eagle geocoder site lets you enter a street address or street intersection. It displays the coordinates as well as a long list of geographic codes (and will also draw you a map of the area about the point.)
- To get the coordinates of any ZIP code or city use Chris Stuber's Gazetteer
- To view the region of interest try the Reference Maps feature of American Fact Finder at the Census Bureau.
- An alternate site for street addresses or street intersections is the Yahoo Map Server (but you'll need to see the help to find lat-long coordinates).
- View county names on state level maps, check the Census Bureau's Map Stats

Iote: If you specify a lat-long location the variable "distance" will be added to your output. This requires that weigh entroids also be calculated (set automatically). The "distance" variable will be between the weighted centroid and t pecified Point. If you specify Ring Pseudo-Geocodes then distance and weighted centroid values will *not* be calculated o tored (because weighted centroids of donuts are misleading).

Bounding Box Filter Option

f you want to limit processing to blocks with center points that fall in a specified rectangular area you can enter the oordinates for such a "bounding box" next.

)efine the "bounding box" coordinates in decimal degrees:

Northern-most Latitude Southern-most Latitude
Western-most Longitude Eastern-most Longitude

Process time for large areas may be several minutes.

Reset Defaults Run Request

Last Modified: 08/29/2003 09:21:42

county	tract	block	cntyname	ring	pop2k	afact	Total
county	tract	block	cntyname	Ring Area	Total Pop 2000 census	block to ring alloc factor	per distance ring
34013	75.01	1004	Essex NJ	0.25	241	1	
34013	75.01	2000	Essex NJ	0.25	2	1	
34013	75.01	2001	Essex NJ	0.25	23	1	
34013	75.01	2002	Essex NJ	0.25	0		
34013	75.01	2003	Essex NJ	0.25	0		
34013	75.01	2004	Essex NJ	0.25	0		
34013	75.01	2005	Essex NJ	0.25	0		
34013	75.01	2006	Essex NJ	0.25	88	1	
34013	75.01	2007	Essex NJ	0.25	0		
34013	75.01	2008	Essex NJ	0.25	0		
34013	75.01	2009	Essex NJ	0.25	56	1	
34013	75.01	2010	Essex NJ	0.25	0		
34013	75.01	2011	Essex NJ	0.25	0		
34013	75.01	2012	Essex NJ	0.25	0		
34013	75.02	3004	Essex NJ	0.25	76	1	486
34013	74	2000	Essex NJ	0.5	86	1	
34013	75.01	1003	Essex NJ	0.5	465	1	
34013	75.01	1005	Essex NJ	0.5	0		
34013	75.01	1006	Essex NJ	0.5	0		
34013	75.01	1997	Essex NJ	0.5	0		
34013	75.01	3000	Essex NJ	0.5	76	1	
34013	75.01	3001	Essex NJ	0.5	112	1	
34013	75.01	3002	Essex NJ	0.5	61	1	
34013	75.01	3003	Essex NJ	0.5	29	1	
34013	75.01	3004	Essex NJ	0.5	165	1	
34013	75.01	3006	Essex NJ	0.5	273	1	
34013	75.01	3007	Essex NJ	0.5	157	1	
34013	75.01	3008	Essex NJ	0.5	55	1	
34013	75.01	3009	Essex NJ	0.5	60	1	
34013	75.02	2000	Essex NJ	0.5	232	1	
34013	75.02	2001	Essex NJ	0.5	394	1	
34013	75.02	2002	Essex NJ	0.5	179	1	
34013	75.02	2003	Essex NJ	0.5	213	1	
34013	75.02	2004	Essex NJ	0.5	336	1	
34013	75.02	2005	Essex NJ	0.5	309	1	
34013	75.02	2008	Essex NJ	0.5	272	1	
34013	75.02	2010	Essex NJ	0.5	63	1	
34013	75.02	3000	Essex NJ	0.5	8	1	
34013	75.02	3001	Essex NJ	0.5	0		
34013	75.02	3002	Essex NJ	0.5	29	1	
34013	75.02	3003	Essex NJ	0.5	140	1	
34013	75.02	3005	Essex NJ	0.5	80	1	
34013	75.02	3006	Essex NJ	0.5	61	1	
34013	75.02	3007	Essex NJ	0.5	0		
34017	139	1015	Hudson NJ	0.5	0		3855
34013	73	1000	Essex NJ	1	46	1	
34013	73	1001	Essex NJ	1	198	1	

34013	73	1002	Essex NJ	1	175	1	
34013	73	1003	Essex NJ	1	384	1	
34013	73	1004	Essex NJ	1	70	1	
34013	73	1005	Essex NJ	1	0		
34013	73	1006	Essex NJ	1	0		
34013	73	1007	Essex NJ	1	241	1	
34013	73	1008	Essex NJ	1	98	1	
34013	73	1009	Essex NJ	1	222	1	
34013	73	2000	Essex NJ	1	135	1	
34013	73	2001	Essex NJ	1	281	1	
34013	73	2002	Essex NJ	1	375	1	
34013	73	2003	Essex NJ	1	342	1	
34013	73	2004	Essex NJ	1	289	1	
34013	74	1004	Essex NJ	1	0		
34013	74	1005	Essex NJ	1	8	1	
34013	74	2001	Essex NJ	1	86	1	
34013	74	2002	Essex NJ	1	0		
34013	74	2003	Essex NJ	1	0		
34013	74	2004	Essex NJ	1	0		
34013	74	2005	Essex NJ	1	8	1	
34013	74	2006	Essex NJ	1	130	1	
34013	74	2007	Essex NJ	1	147	1	
34013	74	2008	Essex NJ	1	151	1	
34013	74	2009	Essex NJ	1	225	1	
34013	74	2010	Essex NJ	1	314	1	
34013	74	2012	Essex NJ	1	0		
34013	74	2013	Essex NJ	1	0		
34013	74	2014	Essex NJ	1	0		
34013	74	2015	Essex NJ	1	0		
34013	75.01	1000	Essex NJ	1	0		
34013	75.01	1001	Essex NJ	1	0		
34013	75.01	1002	Essex NJ	1	0		
34013	75.01	1007	Essex NJ	1	1	1	
34013	75.01	1008	Essex NJ	1	0		
34013	75.01	1009	Essex NJ	1	0		
34013	75.01	1010	Essex NJ	1	0		
34013	75.01	1011	Essex NJ	1	0		
34013	75.01	1012	Essex NJ	1	0		
34013	75.01	1013	Essex NJ	1	0		
34013	75.01	1995	Essex NJ	1	0		
34013	75.01	1996	Essex NJ	1	0		
34013	75.01	1999	Essex NJ	1	0		
34013	75.01	3005	Essex NJ	1	50	1	
34013	75.01	4000	Essex NJ	1	41	1	
34013	75.01	4001	Essex NJ	1	618	1	
34013	75.01	4002	Essex NJ	1	277	1	
34013	75.01	4003	Essex NJ	1	217	1	
34013	75.01	4004	Essex NJ	1	180	1	
34013	75.01	4005	Essex NJ	1	99	1	
34013	75.01	4006	Essex NJ	1	73	1	
34013	75.01	4007	Essex NJ	1	0		
34013	75.01	5000	Essex NJ	1	162	1	

34013	75.01	5001	Essex NJ	1	254	1	
34013	75.01	5002	Essex NJ	1	287	1	
34013	75.01	5003	Essex NJ	1	0		
34013	75.01	5004	Essex NJ	1	85	1	
34013	75.02	1000	Essex NJ	1	0		
34013	75.02	1001	Essex NJ	1	0		
34013	75.02	1002	Essex NJ	1	0		
34013	75.02	1003	Essex NJ	1	0		
34013	75.02	1004	Essex NJ	1	0		
34013	75.02	1005	Essex NJ	1	0		
34013	75.02	1006	Essex NJ	1	0		
34013	75.02	1007	Essex NJ	1	0		
34013	75.02	1008	Essex NJ	1	0		
34013	75.02	2006	Essex NJ	1	269	1	
34013	75.02	2007	Essex NJ	1	260	1	
34013	75.02	2009	Essex NJ	1	0		
34013	75.02	2011	Essex NJ	1	215	1	
34013	76	1000	Essex NJ	1	238	1	
34013	76	1001	Essex NJ	1	151	1	
34013	76	1006	Essex NJ	1	152	1	
34017	127	9015	Hudson NJ	1	0		
34017	127	9016	Hudson NJ	1	0		
34017	127	9017	Hudson NJ	1	0		
34017	127	9018	Hudson NJ	1	0		
34017	127	9019	Hudson NJ	1	0		
34017	127	9021	Hudson NJ	1	0		
34017	127	9046	Hudson NJ	1	0		
34017	127	9047	Hudson NJ	1	0		
34017	127	9048	Hudson NJ	1	0		
34017	127	9049	Hudson NJ	1	0		
34017	127	9992	Hudson NJ	1	0		
34017	128	3007	Hudson NJ	1	130	1	
34017	128	3008	Hudson NJ	1	101	1	
34017	128	3009	Hudson NJ	1	96	1	
34017	128	3010	Hudson NJ	1	119	1	
34017	128	3011	Hudson NJ	1	3	1	
34017	128	3012	Hudson NJ	1	4	1	
34017	135	1005	Hudson NJ	1	345	1	
34017	135	1006	Hudson NJ	1	427	1	
34017	135	1007	Hudson NJ	1	578	1	
34017	139	1000	Hudson NJ	1	0		
34017	139	1001	Hudson NJ	1	0		
34017	139	1002	Hudson NJ	1	71	1	
34017	139	1003	Hudson NJ	1	189	1	
34017	139	1004	Hudson NJ	1	117	1	
34017	139	1005	Hudson NJ	1	111	1	
34017	139	1006	Hudson NJ	1	120	1	
34017	139	1007	Hudson NJ	1	112	1	
34017	139	1008	Hudson NJ	1	84	1	
34017	139	1009	Hudson NJ	1	37	1	
34017	139	1010	Hudson NJ	1	0		
34017	139	1011	Hudson NJ	1	3	1	

34017	139	1012	Hudson NJ	1	0		
34017	139	1013	Hudson NJ	1	0		
34017	139	1014	Hudson NJ	1	0		
34017	139	1016	Hudson NJ	1	0		
34017	139	1017	Hudson NJ	1	0		
34017	139	1018	Hudson NJ	1	0		
34017	139	1999	Hudson NJ	1	0		
34017	139	2001	Hudson NJ	1	410	1	
34017	139	2006	Hudson NJ	1	171	1	
34017	139	2007	Hudson NJ	1	8	1	
34017	139	2008	Hudson NJ	1	322	1	
34017	139	2009	Hudson NJ	1	24	1	
34017	139	2010	Hudson NJ	1	102	1	
34017	139	2011	Hudson NJ	1	157	1	
34017	139	2012	Hudson NJ	1	141	1	
34017	139	2013	Hudson NJ	1	0		
34017	139	2014	Hudson NJ	1	32	1	11568
34013	68	1000	Essex NJ	2	156	1	
34013	68	1001	Essex NJ	2	19	1	
34013	68	1002	Essex NJ	2	0		
34013	68	1005	Essex NJ	2	704	1	
34013	68	1006	Essex NJ	2	104	1	
34013	68	1007	Essex NJ	2	93	1	
34013	68	1008	Essex NJ	2	218	1	
34013	68	1009	Essex NJ	2	87	1	
34013	68	2000	Essex NJ	2	0		
34013	68	3000	Essex NJ	2	19	1	
34013	69	1000	Essex NJ	2	500	1	
34013	69	1001	Essex NJ	2	497	1	
34013	69	1002	Essex NJ	2	360	1	
34013	69	1003	Essex NJ	2	325	1	
34013	69	1004	Essex NJ	2	225	1	
34013	69	1005	Essex NJ	2	44	1	
34013	69	1006	Essex NJ	2	0		
34013	69	1007	Essex NJ	2	0		
34013	69	1008	Essex NJ	2	27	1	
34013	69	1009	Essex NJ	2	0		
34013	69	1010	Essex NJ	2	0		
34013	69	2000	Essex NJ	2	255	1	
34013	69	2001	Essex NJ	2	305	1	
34013	69	2002	Essex NJ	2	532	1	
34013	69	2003	Essex NJ	2	223	1	
34013	69	2004	Essex NJ	2	53	1	
34013	69	2005	Essex NJ	2	157	1	
34013	69	2006	Essex NJ	2	208	1	
34013	69	2007	Essex NJ	2	160	1	
34013	69	2008	Essex NJ	2	0		
34013	69	2009	Essex NJ	2	10	1	
34013	70	1000	Essex NJ	2	248	1	
34013	70	1001	Essex NJ	2	308	1	
34013	70	1002	Essex NJ	2	398	1	
34013	70	1003	Essex NJ	2	379	1	

34013	70	1004	Essex NJ	2	334	1
34013	70	1005	Essex NJ	2	0	
34013	70	1006	Essex NJ	2	0	
34013	70	1007	Essex NJ	2	235	1
34013	70	1008	Essex NJ	2	115	1
34013	70	1009	Essex NJ	2	141	1
34013	70	1010	Essex NJ	2	314	1
34013	70	2000	Essex NJ	2	356	1
34013	70	2001	Essex NJ	2	112	1
34013	70	2002	Essex NJ	2	61	1
34013	70	2003	Essex NJ	2	148	1
34013	70	2004	Essex NJ	2	103	1
34013	70	2005	Essex NJ	2	78	1
34013	70	2006	Essex NJ	2	144	1
34013	70	2007	Essex NJ	2	71	1
34013	70	2008	Essex NJ	2	0	
34013	70	2009	Essex NJ	2	8	1
34013	70	2010	Essex NJ	2	0	
34013	71	1000	Essex NJ	2	364	1
34013	71	1001	Essex NJ	2	324	1
34013	71	1002	Essex NJ	2	196	1
34013	71	1003	Essex NJ	2	247	1
34013	71	1004	Essex NJ	2	69	1
34013	71	1005	Essex NJ	2	139	1
34013	71	2000	Essex NJ	2	156	1
34013	71	2001	Essex NJ	2	0	
34013	71	2002	Essex NJ	2	230	1
34013	71	2003	Essex NJ	2	3	1
34013	71	2004	Essex NJ	2	30	1
34013	71	2005	Essex NJ	2	8	1
34013	71	2006	Essex NJ	2	195	1
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34013	71	2012	Essex NJ	2	0	
34013	71	2013	Essex NJ	2	0	
34013	71	2014	Essex NJ	2	21	1
34013	71	2015	Essex NJ	2	30	1
34013	71	2016	Essex NJ	2	0	
34013	71	2017	Essex NJ	2	0	
34013	71	3000	Essex NJ	2	37	1
34013	71	3001	Essex NJ	2	242	1
34013	71	3002	Essex NJ	2	209	1
34013	71	3003	Essex NJ	2	400	1
34013	72	1000	Essex NJ	2	456	1
34013	72	1001	Essex NJ	2	374	1
34013	72	1002	Essex NJ	2	442	1
34013	72	1003	Essex NJ	2	380	1
34013	72	1004	Essex NJ	2	478	1
34013	72	1005	Essex NJ	2	383	1

34013	72	1006	Essex NJ	2	381	1	
34013	72	1007	Essex NJ	2	272	1	
34013	72	1008	Essex NJ	2	321	1	
34013	72	1009	Essex NJ	2	80	1	
34013	73	2005	Essex NJ	2	383	1	
34013	73	2006	Essex NJ	2	391	1	
34013	73	3000	Essex NJ	2	176	1	
34013	73	3001	Essex NJ	2	261	1	
34013	73	3002	Essex NJ	2	171	1	
34013	73	3003	Essex NJ	2	17	1	
34013	73	3004	Essex NJ	2	46	1	
34013	73	3005	Essex NJ	2	155	1	
34013	73	3006	Essex NJ	2	113	1	
34013	73	3007	Essex NJ	2	270	1	
34013	73	3008	Essex NJ	2	136	1	
34013	73	3009	Essex NJ	2	101	1	
34013	74	1000	Essex NJ	2	0		
34013	74	1001	Essex NJ	2	0		
34013	74	1002	Essex NJ	2	0		
34013	74	1003	Essex NJ	2	0		
34013	74	1006	Essex NJ	2	5	1	
34013	74	1007	Essex NJ	2	0		
34013	74	1008	Essex NJ	2	0		
34013	74	1009	Essex NJ	2	0		
34013	74	1010	Essex NJ	2	0		
34013	74	1011	Essex NJ	2	0		
34013	74	1012	Essex NJ	2	0		
34013	74	1013	Essex NJ	2	0		
34013	74	1014	Essex NJ	2	0		
34013	74	1015	Essex NJ	2	0		
34013	74	1016	Essex NJ	2	0		
34013	74	1017	Essex NJ	2	0		
34013	74	1018	Essex NJ	2	0		
34013	74	2011	Essex NJ	2	336	1	
34013	74	2016	Essex NJ	2	0		
34013	74	2017	Essex NJ	2	0		
34013	74	2018	Essex NJ	2	28	1	
34013	74	2019	Essex NJ	2	0		
34013	74	2020	Essex NJ	2	330	1	
34013	74	2021	Essex NJ	2	285	1	
34013	74	2022	Essex NJ	2	332	1	
34013	74	2023	Essex NJ	2	0		
34013	74	2024	Essex NJ	2	0		
34013	74	2025	Essex NJ	2	0		
34013	74	2026	Essex NJ	2	0		
34013	74	2027	Essex NJ	2	0		
34013	74	2028	Essex NJ	2	0		
34013	74	2029	Essex NJ	2	0		
34013	75.01	1998	Essex NJ	2	0		
34013	75.02	1009	Essex NJ	2	0		
34013	75.02	1999	Essex NJ	2	0		
34013	76	1002	Essex NJ	2	124	1	

34013	76	1003	Essex NJ	2	317	1
34013	76	1004	Essex NJ	2	134	1
34013	76	1005	Essex NJ	2	333	1
34013	76	2000	Essex NJ	2	257	1
34013	76	2001	Essex NJ	2	529	1
34013	76	2002	Essex NJ	2	362	1
34013	76	2003	Essex NJ	2	234	1
34013	76	2004	Essex NJ	2	46	1
34013	76	2005	Essex NJ	2	331	1
34013	77	1000	Essex NJ	2	268	1
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34039	301	1998	Union NJ	4	0		253168

Reference 9

REICHHOLD

400 Doremus Avenue
Newark, NJ 07105

January 14, 2000

State of New Jersey
Department of Environmental Protection
Office of Air Quality Regulation
P.O. Box 027
Trenton, New Jersey 08625 - 0027

Attention: Emissions Fee Program Administrator

Reference: Facility Status
Pant ID # 05431
Reichhold, Inc.
46 Albert Avenue
Newark, New Jersey 07105

CLOSED

Dear Program Administrator;

Please be advised, the Reichhold, Inc. 46 Albert Avenue facility ceased production operations on or about 1 June 1995. Subsequently, the facility was officially closed and demolished in the spring / summer of 1997.

Due to the facility status, I am requesting Invoice # 992094120 for fiscal year 1999 be rescinded.

Thank you for your assistance in this matter. Should you require any additional information, please do not hesitate to contact me at (973) 465-2192.

Cordially,

REICHHOLD, INC.

John S. Connolly
EHS Team Leader

cc: File

Tel: 973-589-3709
Fax: 973-817-9173

Responsible Care®
A Public Commitment

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Reference 10

State of New Jersey

DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT

Division of Water Policy and Supply

SPECIAL REPORT 10

PRELIMINARY REPORT ON THE GEOLOGY AND GROUND WATER IN THE NEWARK, NEW JERSEY, AREA

1951

NJ Con-58-10

STATE OF NEW JERSEY

DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT

CHARLES R. ERDMAN, JR., COMMISSIONER

DIVISION OF WATER POLICY AND SUPPLY

HOWARD T. CRITCHLOW, DIRECTOR AND CHIEF ENGINEER

SPECIAL REPORT 10

PRELIMINARY REPORT ON THE GEOLOGY AND GROUND-WATER SUPPLY OF THE NEWARK, NEW JERSEY, AREA

By

Henry Herpers

and

Henry C. Barksdale

1951

Prepared in cooperation with the
United States Department of the Interior
Geological Survey

LETTER OF TRANSMITTAL

Honorable Charles R. Erdman, Jr., Commissioner
Dept. of Conservation & Economic Development

Dear Sir:

I am transmitting herewith a report on the ground-water supplies of the Newark, New Jersey, area prepared by Henry Herpers of the State Geologic & Topographic Survey, and Henry C. Barksdale, District Engineer of the United States Geological Survey. This report has been prepared in cooperation with the United States Geological Survey as a part of the cooperative investigation of the ground water resources of the State.

The report describes the geology and ground-water conditions in the City of Newark and its vicinity. It defines the limits of a gravel-filled preglacial channel, the existence of which has only been inferred heretofore. It describes the critical lowering of the water levels in the eastern part of Newark, and the rather general intrusion of salt water into the water-bearing formations in that area. The report points out that the safe yield of the water-bearing formations in parts of the area may have been exceeded, and that further large developments in other parts of the area should be made with great caution, if at all.

I, therefore, recommend that this report be published as a Special Report of the Division of Water Policy & Supply, in order that the information contained therein may be made available to the people of the State.

Respectfully submitted,

H. T. CRITCHLOW
Director & Chief Engineer

Encl.

October 22, 1951

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DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY AND SUPPLY
520 EAST STATE STREET, TRENTON 9, N. J.

WATER POLICY AND SUPPLY COUNCIL

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PRELIMINARY REPORT ON THE GEOLOGY AND GROUND-WATER SUPPLY OF THE NEWARK, NEW JERSEY, AREA

By Henry Herpers and Henry C. Barksdale

ABSTRACT

In the Newark area, ground water is used chiefly for industrial cooling, air-conditioning, general processing, and for sanitary purposes. A small amount is used in the manufacture of beverages. Total ground-water pumpage in Newark is estimated at not less than 20,000,000 gallons daily.

The Newark area is underlain by formations of Recent, Pleistocene and Triassic age, and the geology and hydrologic properties of these formations are discussed. Attention is called to the important influence of a buried valley in the rock floor beneath the Newark area on the yield of wells located within it. Data on the fluctuation of the water levels and the variation in pumpage are presented, and their significance discussed. The results of a pumping test made during the investigation were inconclusive. The beneficial results of artificially recharging the aquifers in one part of the area are described.

The intrusion of salt water into certain parts of the ground-water body is described and graphically portrayed by a map showing the chloride concentration of the ground water in various parts of the City. Insofar as available data permit, the chemical quality of the ground water is discussed and records are given of the ground-water temperatures in various parts of the City.

There has been marked lowering of the water table in the eastern part of the area, accompanied by salt water intrusion, indicating that the safe yield of the formations in this part of Newark has probably been exceeded. It is recommended that the study of the ground-water resources of this area be continued, and that artificial recharging of the aquifers be increased [illegible] as wide an area as possible.

Analy[illegible] made by the City Chemist of Newark showed chloride contents ranging from 250 to 2,500 parts per million in water taken from wells in 1942, in this same area. Moreover, in 1947 the general water level ranged from 125 to 200 feet beneath the land surface, and pumping levels in wells ranged from 135 to 290 feet, depending upon the amount of water pumped and the season of the year. In view of these facts, it was decided to make an intensive study of the geology and ground water of the Newark area, and to publish a report on the findings, in order to summarize and make generally available our knowledge of the quantity and quality of ground-water resources of the area, and to facilitate the planning of ground-water pumpage in the future.

The area included in the present study and referred to herein as the Newark area is shown on figure 1. It lies principally in Essex County, but includes small parts of Hudson and Union Counties. It includes all of the city of Newark, except the extreme western part; the greater part of Harrison; and parts of Kearny, Irvington, East Orange, Bloomfield, and Elizabeth.

The Newark area lies wholly within the physiographic province known as the Piedmont Plain. The southeastern part of the area is a lowland with considerable tidal marsh, and the balance of the area is characterized chiefly by low ridges trending in a northeasterly direction. The average annual rainfall at Newark is approximately 47 inches, and the mean annual temperature is about 53°F.

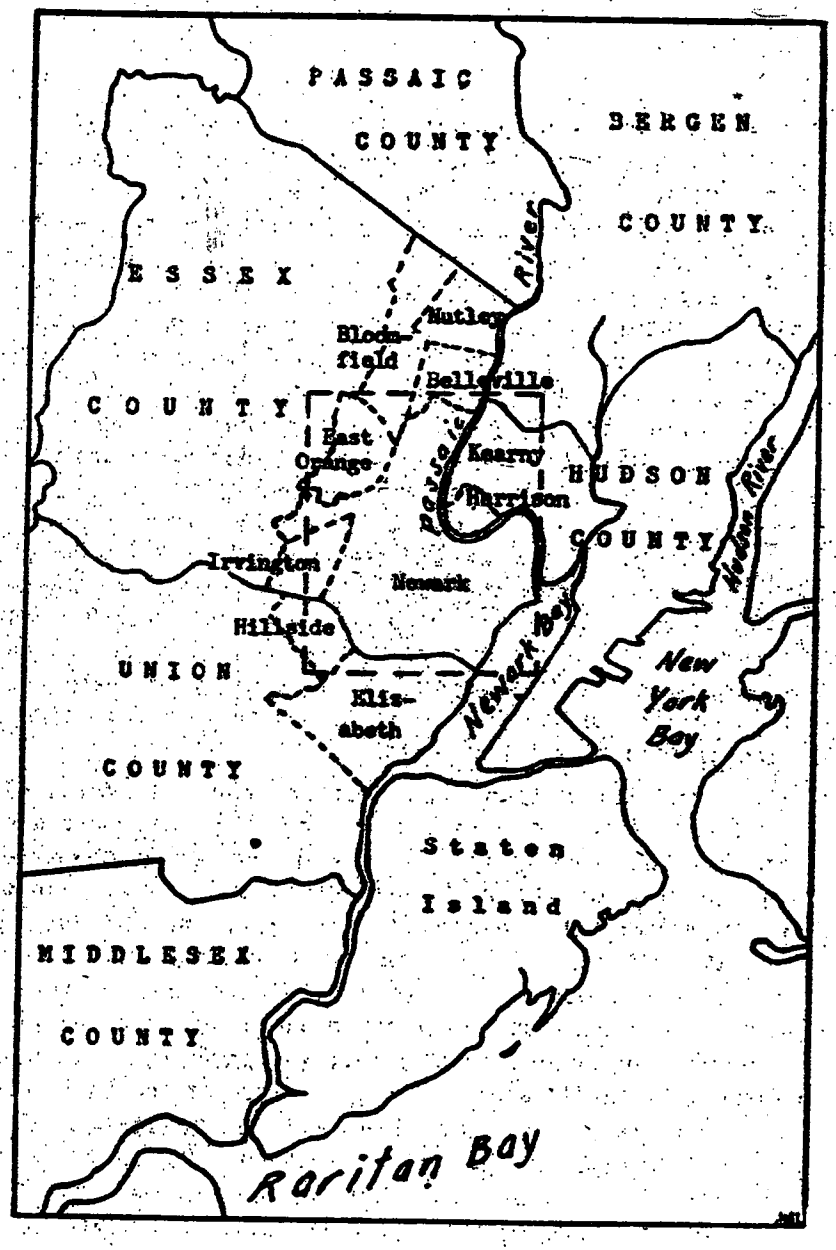

Figure 1.-Map of northeastern New Jersey, showing location of the Newark area.

INTRODUCTION

Purpose and scope of investigation

In the Newark area, the chief uses of ground water are for cooling by industries, for air-conditioning, and for general processing and sanitary purposes. Several beverage manufacturers use ground water as an ingredient in their products, and the water from a few wells is used for drinking. As one result of a recently completed survey of all known wells, it is estimated that not less than 20 million gallons of ground water is used in this area per day. In summer an estimated one to one and a half million gallons of ground water is used for air-conditioning alone.

Records kept by various well owners and by State and Federal agencies have shown a marked lowering of the water level in many Newark wells, as well as a diminution in the yield of some. They have also shown that the ground water in certain parts of the area has become brackish because of heavy pumpage and the infiltration of salt water from surface sources. These conditions are particularly severe in the eastern part of Newark, in what is known locally as the "Ironbound District." In order to give some conception of the seriousness of these conditions, it may be mentioned that in the year 1879 the water level in wells in eastern Newark ranged from a few feet above to 25 feet below the surface of the ground, and several 8-inch wells yielded as much as 500 gallons per minute when pumped by direct suction. Analyses of the water from these wells showed that it contained only 10 to 25 parts per million of chloride.[1]

1/Annual report of the State Geologist, p. 126 ff

Acknowledgments

This report is the result of cooperative work by the Geologic and Topographic Survey and the Division of Water Policy and Supply, both of the New Jersey Department of Conservation and Economic Development, and by the United States Geological Survey. M. E. Johnson, State Geologist, H. T. Critchlow, Director of the Division of Water Policy and Supply, and A. N. Sayre, Geologist in Charge, Ground Water Branch, U. S. Geological Survey, have exercised general supervision over the work since its beginning. Mr. Johnson and Henry C. Barksdale, District Engineer of the Ground Water Branch, U. S. Geological Survey, have shared local responsibility for the progress and details of the work. The gathering of the data necessary for the preparation of this report has been largely in the hands of Henry Herpers of the Geologic and Topographic Survey and Jerome M. Ludlow of the U. S. Geological Survey. The greater part of this report was written by Mr. Herpers. The sections on the hydrology of the various formations were written by Mr. Barksdale.

Needing the help of the citizens and industries of Newark, and believing that they would gladly cooperate if they knew the facts, the Newark Chamber of Commerce was advised of the proposed survey and report, and a story giving the reasons for the work and indicating its importance was given the press early 1947. It is now the authors' pleasure to express their sincere appreciation of the help given the project by almost everyone approached. The work of gathering data was materially facilitated by the assistance of the following well contractors: Artesian Well and Equipment Co., C. W. Lauman & Co., Layne-New York Co., Parkhurst Well and Pump Co., Rinbrand Well Drilling Co., Samuel Stothoff Co., and William Stothoff Co. Especially valuable data on the operating characteristics of their wells, and other aid, were freely given by Mr. B. H. Bishop and other engineering personnel of P. Ballantine & Sons and by Mr. Wm. E. Helmstaedter, Mechanical Engineer, and others of the Celanese Corporation of America. Particular acknowledgment is made of the assistance rendered by P. Ballantine & Sons in making their well field available for pumping tests and altering their plant routine to meet the requirements of the test. The Division of Water and the Department of Health of the City of Newark have assisted materially in locating wells and in furnishing records of analyses of well water.

OUTLINE OF GEOLOGY

The Newark area lies wholly within the section of New Jersey underlain by the Newark group of rocks of Triassic age. These rocks form a belt extending from the Hudson River across central New Jersey, Pennsylvania, and Maryland, and into Virginia. They consist of shale, sandstone, argillite, and conglomerate with included sheets, sills, and dikes of trap rock (basalt and diabase).

In New Jersey, the sedimentary rocks of the Newark group have been divided on the basis of their lithology into three units. The lowest is chiefly red, buff, or gray arkosic sandstone and is called the Stockton formation; the middle unit, called the Lockatong formation, is composed largely of gray, purplish-gray, or dull-red argillite; and the uppermost unit, the Brunswick formation, consists chiefly of soft red shale and red sandstone. The Brunswick formation is the bedrock throughout the Newark area. In general, the strata have been tilted northwestward and locally they have been warped into gentle flexures with occasional faulting. The harder beds form ridges, most of which trend northeastward.

The northern part of the belt of Triassic rocks was glaciated in late geologic time, so that much of the surface is covered with a mantle of glacial drift, which in many places is thick enough to conceal the bedrock surface. Although the bedrock crops out in only a few places, it accounts for the relief in the western part of the Newark area. There the covering of glacial drift is thin. In the eastern section the bedrock is concealed by thick deposits of silt and clay with

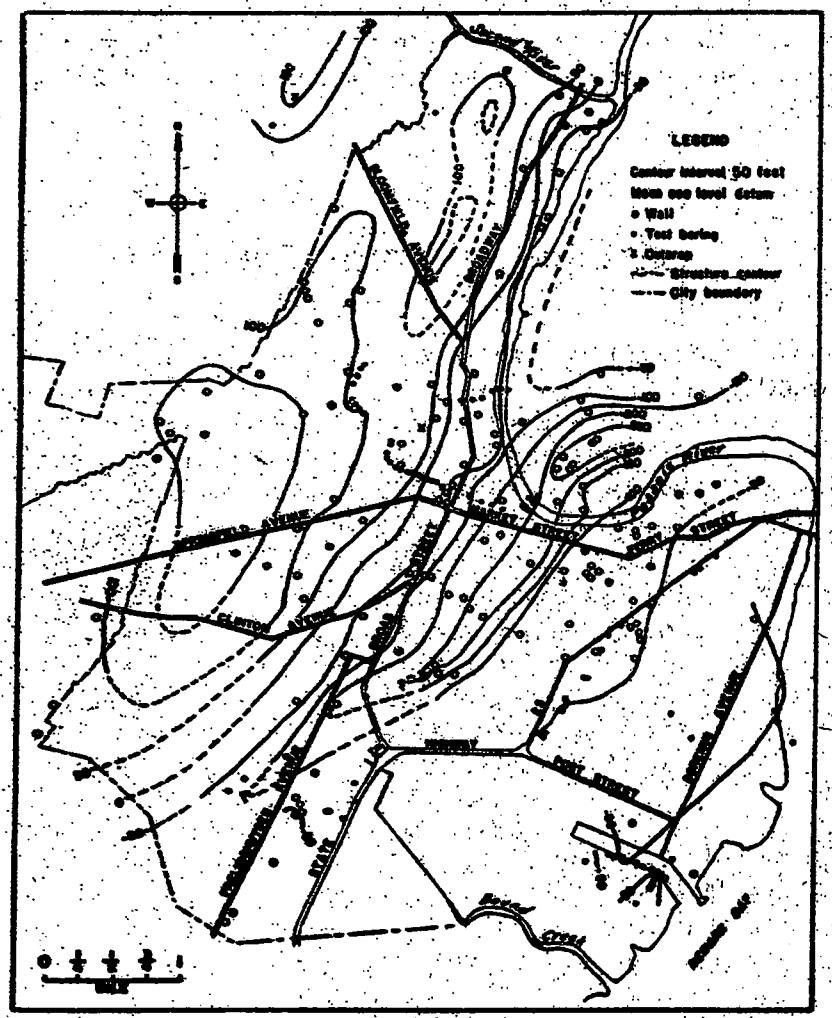

Figure 2.-Map showing elevation and configuration of bedrock beneath Newark, N. J., and vicinity.

thinner beds of sand and gravel, and, although topographically this region is a plain, borings have shown that the surface of the underlying bedrock does not conform with the ground surface. (See figure 2). The valleys of many of the streams in the glaciated area contain terraces of sand and gravel of glacial origin.

The geologic history of the area since the beginning of Triassic time is relatively simple. During Triassic time, sands and muds were deposited in an arid basin. Near the end of Triassic time the beds were faulted and tilted toward the northwest. Later erosion reduced the surface to a plain, over which the sea then advanced an indeterminate distance to the northwest. Sands and clays, such as those found in the coastal plain, were deposited in this sea. Still later, the sea withdrew and the forces of erosion removed the sediments of the coastal plain and then etched out the larger topographic features that we see today. During the Pleistocene epoch the details of the topography were altered by the ice. Hills were smoothed somewhat and much drift was deposited. The drift in some places filled valleys existing prior to glaciation and effected important changes in drainage. A general rise of sea level at the close of the Pleistocene epoch flooded low areas adjacent to the coast, forming Newark Bay at the junction of the Hackensack and Passaic Rivers. Since then the meadows have been formed by stream deposits, and very, very recently -- in terms of the geologic calendar -- much meadowland has been reclaimed by suitable drainage and by filling. A typical example of such "made" land is the area upon which Newark Airport has been built.

The succession of formations in the Newark area, arranged in normal sequence (i.e., youngest formation at top) is shown in the following table:

Table 1.--Stratigraphic table in the Newark area

Cenozoic era
- Quaternary system
  - Recent series
    - Alluvium and meadow muck
  - Pleistocene series
    - Glacial till and stratified deposits of glacial origin

UNCONFORMITY

Mesozoic era
- Triassic system
  - Newark group
    - Brunswick formation

UNCONFORMITY

Older rocks[2]

2/The deepest well drilled in Newark failed to pass through the red shale and sandstone at 2,538 feet. It cannot, therefore, be stated with certainty what sort of rock lies below the city at great depths. From the general geology of the Triassic rocks, presumably the Palisade diabase would be found at great depth, and more rocks of the Newark group below the diabase. Below the Triassic rocks lie crystalline rocks of very great age which extend to an undetermined depth.

HYDROLOGY AND GEOLOGY OF THE ROCK FORMATIONS

Recent deposits

Recent deposits are found mainly in the eastern part of the Newark area, where they occur in the tidal marshes or meadow lands along Passaic River and bordering Newark Bay. They consist largely of unconsolidated mud and silt with inclusions of peat and other organic materials and occasional lenses of sand and gravel. They have been deposited on top of the Pleistocene sediments, or perhaps in places directly on the Triassic rocks, by the Passaic and Hackensack Rivers and by smaller streams flowing across the area and discharging into those rivers, or into Newark Bay. The Recent deposits range in thickness from a feather edge to 35 feet.

Hydrologically, the Recent deposits are of relatively little importance except as they may transmit water to the underlying rocks or exclude it from them. Their permeability is relatively low and they occur in the parts of the area that are exposed to salt water. Therefore their action as a barrier in retarding the percolation of salt water into the underlying rocks is perhaps their most important function. In this respect they perform imperfectly because there probably are breaks in the cover that they provide at critical points, such as the ship channels in the river and in the bay.

Pleistocene deposits

The Pleistocene deposits in the Newark area are all of glacial origin. They consist of till--an unconsolidated, unstratified, heterogeneous mixture of clay, boulders, and sand--and stratified glacial drift, which is composed of sand and gravel that have been more or less sorted and stratified by the action of glacial waters. The deposits of glacial origin overlie the bedrock throughout practically all the Newark area, the bedrock cropping out only in a few more or less isolated spots. The thickness of the Pleistocene deposits varies greatly. In the western part of the area they are only a few feet thick, forming a thin veneer over the underlying bedrock, but in the eastern part of the area they

are so thick that they mask entirely the topography of the underlying rock. The map of the elevation and configuration of the bedrock beneath Newark, N. J., and vicinity (figure 2) shows that, in the area east of Broad Street, there is a large deep valley cut in the bedrock, which is entirely covered by glacial drift. At the surface this area presents the aspect of a plain. The depth to rock in the buried valley ranges from 125 feet to more than 190 feet in Newark, and to as much as 300 feet in Harrison. Farther east in the Newark area, bedrock lies at lesser depths. The buried valley extends northeastward across the city from its southwestern boundary, crossing Frelinghuysen Avenue near its northern end, and then extends east of and roughly parallel to Broad Street, finally crossing over into Harrison, where it bends eastward. It has not yet become possible to show the extension of the valley to the southwest or to the east because of the lack of sufficient reliable boring data, but its course and shape across the city of Newark is fairly accurately known. From its shape as shown on plate 1, it is apparent that the valley slopes toward the northeast, and this direction is therefore the probable direction of flow of the river that cut the valley prior to the Pleistocene epoch.

The character of the Pleistocene deposits varies throughout the Newark area. In general, these deposits consist chiefly of till in that part of the area lying west of Broad Street, whereas the cuttings taken from many test borings and wells in the eastern part of the area show that the Pleistocene deposits there consist largely of stratified materials with interbedded lenses of till. (See logs 1 to 4 in appendix.)

The Pleistocene deposits in the bottom of the buried valley are worthy of special attention. In the southwestern part of the Newark area they consist for the most part of fine sand and clayey sand, but in the northeastern part the bottom of the valley contains deposits of coarse sand and gravel which in many places contain much water. (See logs 1 and 2 in appendix.) In fact, some of the best wells in the Newark area pump from these deposits.

C[illegible]oarse deposits of glacial origin are found in the [illegible] of the Passaic River north of the point where the river makes its great eastward bend.

The Pleistocene deposits are one of the two major aquifers in the area. Their hydrologic function is twofold. In the first place, under favorable circumstances they yield water in substantial quantities directly to wells. In the second place, they absorb and store water from precipitation and from surface sources and transmit it to the underlying rocks.

Where the deposits contain beds of sand and gravel that are thick enough and extensive enough, they yield large quantities of water to wells finished in them. Insofar as is known, these conditions are limited almost entirely to the buried valley, where several wells yielding from 175 to more than 600 gallons per minute have been developed. For example, a well drilled for the Driver Harris Co. in Harrison near the locality where the buried valley crosses the Passaic River yielded 600 g.p.m. with a draw down of approximately 60 feet.

Detailed and extended records of water levels in and of pumpage from wells in this aquifer are not available. It is therefore impossible to say at this time whether water is being withdrawn from this aquifer at a rate less than, equal to, or greater than the rate at which recharge is available. The fact that two or three million gallons of water have been withdrawn daily for a number of years from the sand and gravel in the buried valley suggests that a large quantity of recharge occurs. On the other hand, the fact that the static water levels in some wells tapping this aquifer are now substantially below sea level suggests caution before further developments are made.

A more definite and immediate threat to the safe yield of the gravels of Pleistocene age is the apparent intrusion of salt water from surface sources. Wells near the point where the buried valley crosses the Passaic River are yielding water that contains 200 to 500 parts per million of chloride and is already unsuitable for some uses. Inasmuch as there is hydraulic continuity between the gravels and the underlying rocks, the problem of salt-water intrusion will be discussed in more detail in a section of this report that deals primarily with the water supply from the rocks.

The second function of the Pleistocene deposits, that of absorbing, storing, and transmitting water to the underlying rocks, is, in the aggregate, more important than their yielding water directly to wells. As already indicated, they overlie the rocks to varying thicknesses throughout most of the area. In general, there appears to be some correlation between the thickness and nature of the Pleistocene deposits and the yield of wells tapping the underlying rocks. This is to be expected because the storage capacity of the rocks is relatively low and sustained large yields can be obtained from them only if some adequate source of recharge is available. Where the overlying deposits are thick and moderately porous and permeable, they supply the necessary recharge. On the other hand, where they are thin or relatively impermeable, they may fail to supply recharge to the rocks or may even retard the movement of water into them.

Newark group

Brunswick formation

Geology

As mentioned previously in the outline of the geology of the Newark area, the sedimentary rocks of the Newark group of Triassic age in New Jersey have been divided upon the basis of their lithology into three units--the lower, or Stockton formation, the middle, or Lockatong formation, and the upper, or Brunswick formation. It should now be pointed out that whereas these lithologic distinctions can be made in central New Jersey, they are not apparent in the northern part of the belt of Triassic rocks. The Lockatong formation does not continue farther northeastward than Franklin Park, Middlesex County, and the distinction between the Stockton and Brunswick formations is no longer obvious, as it is farther southwestward, because the whole Newark group becomes, in general, coarser-grained. In the northern part of the State, particularly in Bergen County, these sediments become predominantly sandy and even conglomeratic. In the Newark area, the tendency of the rocks to increase in coarseness toward the northeast is shown by the fact that wells drilled in the southern part,

near the Elizabeth line, have penetrated rock that is chiefly soft red shale, whereas in north Newark, especially near the Belleville line, the rocks are principally sandstone with interbedded shale. In fact, during the latter part of the last century several sandstone quarries were operated in north Newark, especially along Bloomfield Avenue and in the southern part of Branch Brook Park. The change from soft shale to hard sandstone is reflected in the change in topography from a rather flat, low-lying plain with few rock hills in southern Newark to hills with rather pronounced relief in the northern part of the city. In the Newark area, therefore, the bedrock is all designated as Brunswick formation. A representative section showing the variations in the rock under Newark is shown in log 3. (See appendix 1.)

The bedrock originated as sand, silt, and mud which were derived from the erosion of older rocks northwest and southeast of the great basin in which the sediments were laid down during the Triassic period. Three times during the period of deposition great sheets of basaltic lava were poured out on the surface and were then buried by sediments later in the Triassic. The remnants of the flows now form the Watchung Mountains, but it is impossible to state whether or not the flows ever extended as far east as the Newark area, for there are no igneous rocks of this type in that area, so far as is known. Toward the end of the Triassic period, the sediments were intruded by similar magma which apparently did not have enough force to push through to the surface but spread out beneath the surface in a great sill some 900 feet or more thick, usually following the bedding planes of the sediments but frequently cutting across them. Because of erosion, the sill is exposed today in the Palisades in eastern Hudson and Bergen Counties and also in certain mountains in central New Jersey. At the close of Triassic time, the entire Newark group of rocks were tilted toward the northwest, which is their attitude today and in the process they were faulted and greatly fractured.

The total thickness of the rocks of Triassic age in the Newark area is unknown but is estimated at about 6,000 to 7,000 feet.

The deepest well drilled in Newark reached a depth of 2,538 feet and failed to pass through the normal red shales and sandstones. It is therefore impossible to state with accuracy what lies below that depth, but presumably a well drilled to great depth in Newark would eventually strike the Palisade diabase, and below that would strike more sedimentary rocks of Triassic age before entering the crystalline basement rocks upon which the Triassic sediments were deposited.

Hydrology

GENERAL.--

14

The Brunswick formation yields water primarily and almost exclusively from the cracks in the rocks of which it is composed. The primary pore spaces in the rocks are generally so small that water moves through them very slowly, if at all, under the hydraulic gradients that are established by pumping. Were it not for the fact that the formation has been extensively cracked and fractured, and has thus acquired a kind of secondary permeability, it would yield very little water.

There is in the Brunswick formation a kind of modified water-table condition wherein the water is generally free to move in any direction and seek the level determined by the factors affecting recharge and discharge. The various systems of cracks intersect so that water can move more or less freely in all directions. However, the cracks are not of uniform size and capacity in all directions, and water is likely to move more freely in some directions than in others. For the area as a whole, there may be no one direction that is generally more favorable to flow than others. It probably differs from place to place.

The capacity of the formation to store and transmit water decreases with depth. As greater depths are reached, the weight of the overlying materials increases and tends to close the cracks. Thus less and less space is available to store water and the resistance to its movement is increased. It is probable that the cracks [illegible]re horizontal, or nearly so, are first affected and most affected in this way. The horizontal cracks tend to distribute water uniformly in all directions, so that the tendency of the water to flow in the direction of the prevailing vertical cracks is probably accentuated with depth. The cracks along the bedding planes, which appear to be very numerous near the surface and are more nearly horizontal than vertical, probably are less and less important with depth.

There is, therefore, little foundation for the common belief that water is transmitted for long distances underground through the Brunswick formation, particularly along the bedding planes of the rocks. It is unlikely that the bedding planes, or rather the horizontal cracks along them, provide the path of least resistance to the flow of water. Actually, water probably flows through the formation most readily in vertical or nearly vertical cracks. Except along major faults, individual vertical cracks are not likely to extend very far without interruption, and are not likely to transmit water for distances greater than 2 or 3 miles. Furthermore, as the vertical cracks necessarily intersect the rock surface locally, they will receive recharge or discharge water locally depending upon the hydraulic gradient.

Certain characteristics of individual wells in the area may be better understood in the light of the foregoing general description of the rocks from which they draw their water. The yield of a well tapping the Brunswick formation depends primarily upon the number and size of the cracks that it encounters below the water table, or more specifically upon their capacity to transmit water. Thus, two adjacent wells may pass through almost identical layers of rock, and one may yield a substantial quantity of water whereas the other may yield very little, depending upon the character of the cracks encountered in each. It is therefore impossible to predict the yield of a proposed well except in general terms based upon the average yield of other wells in the vicinity. Furthermore, all predictions of yield of wells in the Brunswick formation should be qualified by a statement that the final proof must be the actual yield of the finished well, because the number and capacity of the cracks encountered cannot be determined in advance.

There is usually little or nothing to be gained by deepening an unsuccessful well below the average depth of the productive wells in the area, because the cracks become smaller and probably less numerous with increased depth. It is almost always wiser to move to another site, even if only a short distance away, and to drill another well, rather than to double the depth of a poor well in the hope of improving its yield. It is obviously impossible to determine the nature and pattern of the deeply buried cracks at any site from observations at the surface. There are, of course, rare exceptions to this general rule, but it holds well enough to make its observance sound economic policy. For example, it has already been mentioned that one well in Newark was drilled to a depth of more then 2,500 feet. That well, though very expensive, was unproductive.

As a general rule, in the Brunswick formation most of the productive cracks occur within the first 200 or 300 feet of the rock. In some parts of the Newark area, however, most of the productive wells penetrate the rock 400 or even 500 feet. Sufficient data are not available to indicate whether the rock there is unusually productive at great depths or whether many of these wells are unnecessarily deep, because most of them were not tested before they had been drilled to their full depth. It is possible that the bottom parts of many of these holes are not very productive.

An interesting though probably extreme example of a well that was unproductive at depth is one about 800 feet deep that was observed in the course of the studies preceding this report. When the regional water level declined, the yield of this well dropped sharply. With the thought that some of the productive cracks might have been clogged either in the drilling or subsequently, the owner employed a driller to clean out and redevelop the well. A thorough job was done and it is unlikely that there remained any cracks that were sealed with mud or otherwise clogged. Nevertheless, the yield of the well did not improve substantially. It was therefore abandoned and made available as an observation well. During the spring and early summer of 1947 the water level in the well declined normally to a level of 161 feet below mean sea level, where it stopped abruptly. While the water levels in other

observation wells in the vicinity continued to decline to about 230 feet below mean sea level and the pumping levels in some adjacent wells were still lower, the water level in this well remained at 161 feet. In the late fall and winter, after the regional water level had recovered to 161 feet, this well again became responsive to variation in pumpage and fluctuated normally. The same performance was repeated in the summer of 1948 and again took place in 1949. Apparently the only explanation for the peculiar behavior of the water level is that no cracks were encountered below 161 feet and that therefore the well is water-tight at greater depths. This is, no doubt, an unusual case, but it does serve to emphasize the dependence of the yield of rock wells upon cracks, as well as the relative unimportance of horizontal cracks at depth and the decreased chance of hitting good cracks at increased depth.

The character of the Brunswick formation as an aquifer also explains another peculiarity of the wells that tap it. Ordinarily, in a relatively uniform aquifer, the interference between two or more wells is dependent mainly upon the distance between them. In the Brunswick formation, as in similar aquifers, a pumping well often affects the water level in a second well substantially more than that in a third well at the same distance but in a different direction. The explanation of this peculiarity, of course, lies in the fact that the different systems of cracks differ in their capacity to transmit water.

The Brunswick formation does not yield water as freely as some of the other important water-bearing formations in the State, especially those that yield water from the pore spaces in well-sorted medium-to coarse-grained sand and gravel. This is due primarily to the fact that its capacity to store and transmit water is smaller. The deficiency is most marked in regard to its capacity to store water. The specific yield (the storage capacity expressed as a percentage of the volume of the aquifer) of a coarse, well-sorted sand is frequently as much as 25 percent. The specific yield of the upper 300 feet of the Brunswick formation, based upon the volume of cracks, is probably more nearly in the order of 1 or 2 percent. Therefore, it is easy to understand the hy-

drologic importance of sources of ready recharge such as bodies of surface water or of relatively permeable sand and gravel in areas where large quantities of ground water are withdrawn from the formation. The capacity of individual cracks to transmit water is probably larger than that of a comparable volume of pore spaces in a sand. It is not surprising, therefore, to find that the capacity of the Brunswick formation to transmit water is about one-fourth of that of some of our important sand aquifers in spite of the relatively limited volume of cracks.

Pumping Tests – In January 1949, through the cooperation of the officials of P. Ballantine & Sons, two pumping tests were run on wells tapping the Brunswick formation. For several days all the company's wells were operated to suit the requirements of the test. At each of their two plants two wells were run continuously until conditions approaching equilibrium were established. This involved wasting water at some times of the day in order to have an adequate supply available at others, but it seemed to be the only practical way of reaching an approximate state of equilibrium. After about 24 hours, the effects of changing the rates of pumping at the plant appeared to have been eliminated, and, with one exception which will be discussed later, the effects of pumping at other plants in the area seemed to be of little importance.

The wells pumped during the two tests are shown on figure 3. They were selected to provide the best possible spread of observation wells in as many directions as possible. The first test was made by pumping well 1 at plant 1. This well is centrally located, and water levels were observed in seven other wells at various distances and directions from it. In the second test, well 9 at plant 2 was pumped and water levels were observed in the same group of observation wells. In this test, however, the pumping well was in one corner of the well field so that the distances to [illegible] servation wells were greater and their directions [illegible] ess varied.

During the pumping tests, water-stage recorders were maintained on well 5 at plant 1 and on wells 8 and 10 at plant 2. The water levels in well 7 at plant 1 were measured by air pressure, using an 8-inch pressure gage on which it was possible to note changes of water level of one- or two-tenths of a foot. The water levels in the other wells were measured by air pressure, using ordinary pressure gages that would probably not indicate changes of water level of less than one foot. There were only four wells, therefore, in which water levels could be observed accurately; of these wells 5 and 7 at plant 1 appear to have been drawn down below the most productive cracks encountered in them. The best observations were therefore obtained in wells 8 and 10 at plant 2. Two of the wells observed, wells 4 and 8 at plant 1, were operated continuously during both tests to supply water for manufacturing purposes.

During the first test a prompt and distinct effect was observed in well 8, plant 2, when well 1, plant 1, was started and again when it was shut down. This seemed to indicate that these two wells tapped the same system of cracks. No distinct effect was observed in any of the other wells during this first test, even though it was continued for several hours. Well 7 at plant 1 is almost in a straight line with well 8, plant 2, and well 1, plant 1. It is in the opposite direction from well 1 and only about half as far away, yet no effect was observed in it. No definite effects of pumping or shut-down were observed in any of the other wells.

During the second test, when well 9, plant 2, was pumped a prompt and distinct effect was observed in well 10, plant 2, both at the beginning and at the end of pumping. None of the other wells being observed showed any distinct effect. It is interesting to note, however, that the recorder on well 10 showed a small but definite effect whenever well 27 at the plant of the Celanese Corporation of America was started or stopped. This well is approximately southwest of well 10 and about 2,400 feet from it, a distance substantially greater than that between any of the wells at the Ballantine plants.

It is believed to be significant that [illegible] e wells [illegible]

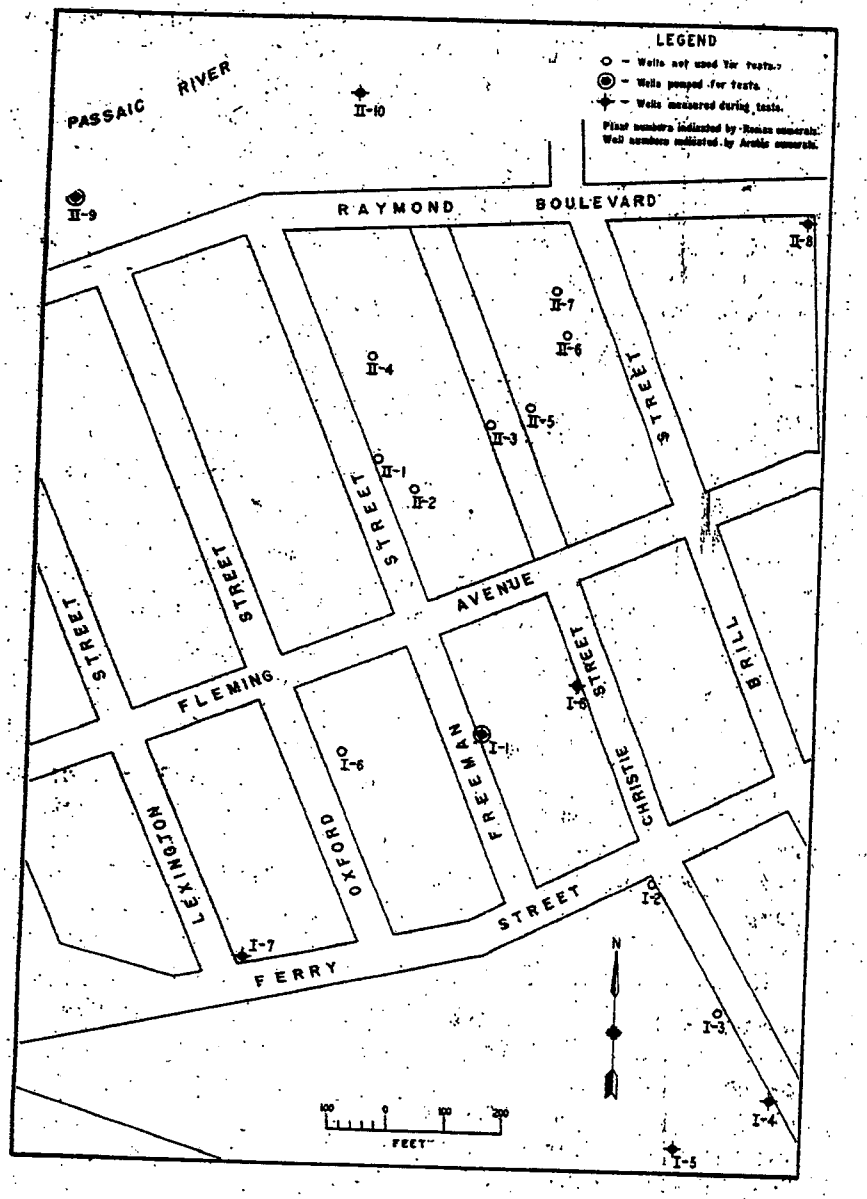

Figure 7. Map of a part of Newark, N. J., showing the location of wells at the plants of F. Ballantine & Sons and indicating the wells used for pumping tests in January 1949.

two tests at the Ballantine plants lay along lines trending in a general northeasterly direction. This seems to indicate that in the vicinity of the Ballantine and Celanese plants there is a dominant system of cracks in that direction. No doubt there are cracks in transverse directions, but their capacity to transmit water appears to be much smaller. Consequently, water moves through the cracks that trend northeast much more easily than it does in other directions and the primary interference between wells is to the northeast or southwest.

One result of this distribution of cracks is that the formulae used to compute coefficients of transmissibility and storage are not applicable to this area. These formulae are based upon the assumption, among others, that water can move freely through the aquifer in all directions. In some other localities where the distribution and character of the cracks are more nearly equal in transverse directions, it is believed that these formulae can be applied significantly to wells in the Brunswick formation. In this part of Newark, however, they do not apply.

The tests were not without significant results, however, merely because it was impossible to compute the usual coefficients from them. For example, in planning the locations of future wells, it should be useful to know the direction in which they will interfere most with each other or with existing wells. Similarly, it might be possible to plan an operating schedule that would minimize interference between wells and thus decrease somewhat the pumping lift. Artificial recharge will be most effective if it is distributed in a direction transverse to the major cracks, thus supplying more of them without depending upon the poorer cracks to distribute the water. The movement of contaminating materials such as salt water from the river or bay is probably most easily accomplished in a northeasterly or southwesterly direction after it reaches the rock. The structure of the rock does not, of course, affect appreciably the movement of such contaminants through the materials above the rock.

Long-term fluctuations of water levels and pumpage - In the investigation that preceded this report, it was found that relatively few well owners had kept accurate and continuous records of pumpage and that still fewer

had more than an occasional record of the water levels in their wells. Fortunately, important exceptions to this general rule were some of the larger users of ground water. In only one part of the area, however - the so-called "Ironbound District" in eastern Newark - was it possible to obtain sufficient data to justify a long-time estimate of pumpage rates and to compare it with similar records of water levels. In this area the two largest users of ground water are P. Ballantine & Sons and the Celanese Corporation of America. These companies are keeping excellent records of pumpage and water levels and have done so for some time.

When the records that these two companies furnished were combined with other data available in the area, it was possible to prepare a diagram (figure 4) that shows some significiant trends of water levels and pumpage.

(16) Probably the most striking features of figure 4 are the long-term trends toward greater pumpage and lower water levels. These two trends go together, of course, and from the studies made thus far it is not possible to say whether the lowering of water levels indicates a pumping rate in excess of natural recharge or merely the lowering necessary to induce flow into the area at the increasing rates. The apparent reversal of the downward trend of water levels in 1948 and 1949 is due to unusually good natural recharge coupled with artificial recharge that will be discussed later.

Almost equally striking are the seasonal fluctuations of water level and pumpage, which are related to each other and are due primarily to seasonal demands for water. Much of the water taken from the ground in the area is used for cooling and the demand is naturally greater in the summer. Furthermore, there is a seasonal demand, which is greatest in summer, for the products of some of the users of ground waters. This tends to accentuate the seasonal use of water. There is, of course, a greater recharge from precipitation during the winter when the demands of vegetation are at a minimum, but this probably accounts for only a few feet of the total fluctuation of water levels.

Ther[illegible] notable similarity between the fluctuations of wate[illegible]al in the different wells shown in the

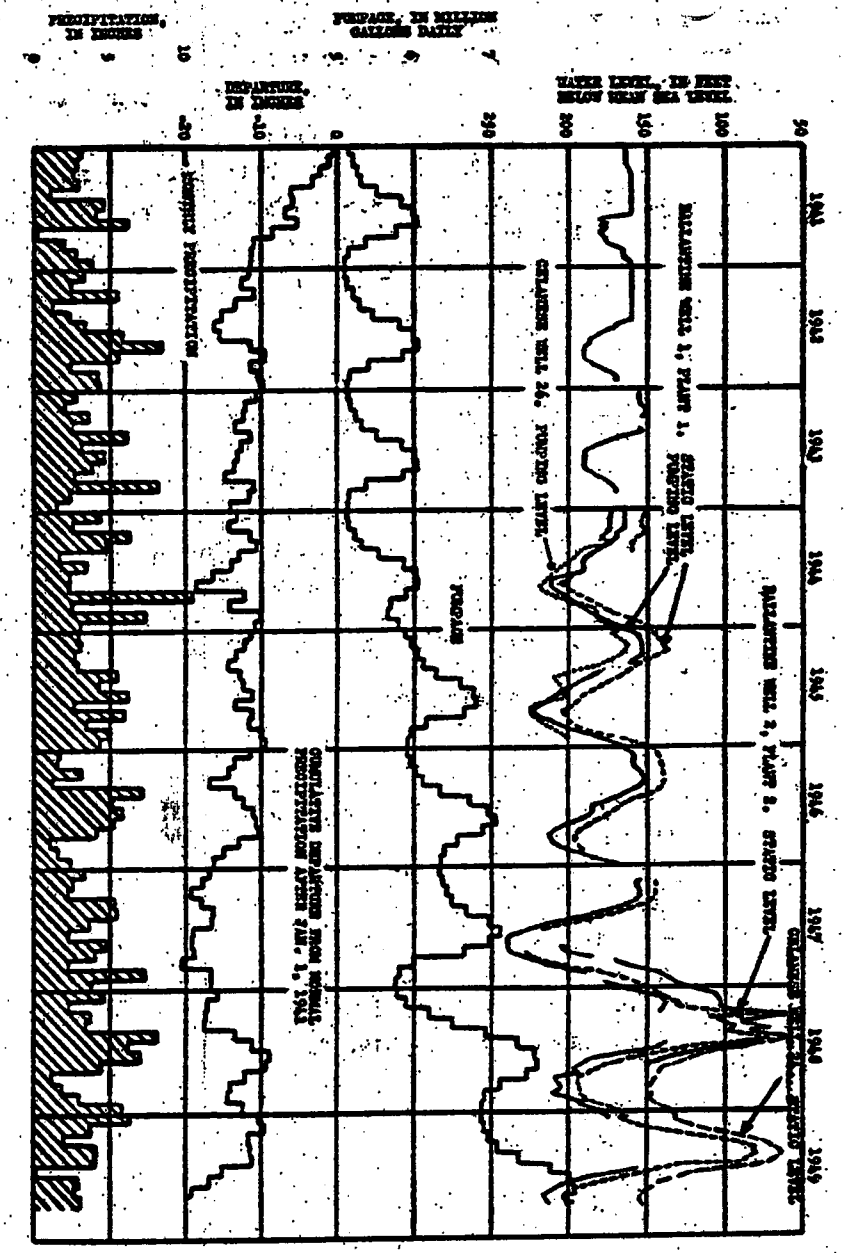

Figure 4.-Diagram showing fluctuations of pumpage and water levels in the eastern part of Newark, the monthly precipitation, and the cumulative departure from normal precipitation, 1941 to 1949.

connection between the various wells in the area and that the regional pumpage is of primary significance in determining the major fluctuations of water level. Minor differences are due, of course, to local conditions.

The wide range of seasonal fluctuations of water levels and the great depths to which they have been drawn are noteworthy. During recent years a change of one million gallons daily in the rate of pumping in this area has resulted in water-level fluctuations in the order of 60 to 75 feet. Furthermore, with a total pumpage of about seven million gallons daily the water levels have been lowered to 200 feet or more below mean sea level. In view of the fact that an early well in this vicinity flowed at an altitude of perhaps 10 feet above sea level, the current water levels represent actual drawdowns of more than 210 feet. The rate of lowering per million gallons pumped seems to be increasing and, indeed, this would be expected because of the decreasing capacity of the cracks with increasing depth. The figures strongly suggest that the rate of pumping in this vicinity cannot safely be increased very much more without serious consequences, unless the increase is accompanied by some measure of conservation such as artificial recharge.

The precipitation at Newark varies considerably from month to month, as indicated at the bottom of the diagram. The trend of the accumulated departure from normal precipitation is perhaps more useful in the study of ground-water trends because it indicates periods when increasing or decreasing amounts of water are available for underground storage or withdrawal. After the very dry period of 1941, the accumulated departure shows an essentially horizontal trend. This indicates that the long-term downward trend of water levels is not due to changes in precipitation. Some of the shorter trends may, however, have had some influence on the water levels. For example, the less severe drawdown in the summer of 1946 than in 1945 is probably due to the above-normal precipitation during the summer of 1946, as indicated by the rising trend of the departure line. Similarly, the sharp decline in the summer of 1947 is probably related to the declining trend of precipitation during that summer. It is obvious from a study of the diagram, however, that the fluctuations of pumpage rather than those of precipitation are the principal causes of the water-level fluctuations.

Artificial recharge.- The graphs of water levels in figure 3 show a sharp and abrupt rise in March 1948 and again in February 1949, both without any corresponding decrease in pumpage. These apparent anomalies are caused by artificial recharging through wells, conducted experimentally by P. Ballantine & Sons with the cooperation of the Newark Water Department. On occasions during the winter when the temperature of the city water was as low as or lower than that of the ground water and when the city's reservoirs were overflowing, conditions were ideal for recharging. Water that would otherwise have gone to waste was stored underground and conserved for future use. Recharge was accomplished through several wells. In 1948 about 168 million gallons was stored in the ground in this way and in 1949 about 236 million gallons.

It had been hoped that the results of the pumping tests discussed earlier in this report would furnish accurate data for evaluating the effects of recharging. Unfortunately, it developed that conditions in this vicinity were unsuited to analysis in this way. However, the evaluation of the artificial recharge is not wholly dependent upon pumping tests.

As a result of the recharging, the water levels in the area as a whole were higher at the beginning of the season of heavy demand than they would otherwise have been. The greatest benefit occurred in the immediate area of the recharging, that is, in the Ballantine well field, but there were substantial gains at considerable distances. For example, during the recharging in 1949 a recorder was maintained on a well of the Celanese Corporation of America approximately half a mile from the center of recharging and water levels there rose sharply and promptly when the recharging was begun.

The water used for recharging probably did not drift very far away from the area in which it was introduced into the aquifer. Previous pumping had established a deep depression in the water table there and the effect of the recharging was to fill the depression partly. The improved water levels observed elsewhere occurred before water could possibly have moved through the aquifer from the point of recharge to the point of

observation. They represented a backing up of water that had previously been flowing into the Ballantine well field and that became available for withdrawal elsewhere when recharging began. The effect outside the Ballantine well field was exactly the same as if the rate of pumping at Ballantine's had been decreased by the amount that was recharged. And indeed the demand upon natural recharge was decreased by exactly that much. Much of the recharge water probably circulated directly to other wells in the Ballantine well field during the recharging. The remainder was almost certainly drawn into them soon after recharging ceased. Whatever benefits were derived from the higher quality and lower temperature of the recharge water were probably restricted entirely to the Ballantine well field. The gain in head and therefore in water stored in the ground extended to other nearby parts of the area.

Observations made during the recharging experiments indicated that the water levels in parts of the Ballantine well field may have risen above the top of the rock. This is not surprising in view of the limited capacity of the cracks in the rock. As soon as the water levels rose into the overlying glacial material the storage capacity was much greater. At no time did the head rise far enough to cause any loss of recharge water out of the system of aquifers. The highest water levels during the recharging were still more than 50 feet below mean sea level.

Chemical quality of the ground water

The chemical quality of the ground water from rock wells in the Newark area is shown by the analyses in table 1, on page 49. Analyses A and B are of water taken from wells in the western part of the area farthest removed from the Passaic River and Newark Bay. The water is hard, principally because of its calcium and magnesium content. It is too hard for boiler use, but is suitable for most other uses, particularly for cooling. Several tanneries using ground water in their [illegible] report that the quality of the water has a [illegible] effect on their processes. One producer imparted a pleasing taste to his product. Where not contaminated by bacterial or other harmful impurities, the water is potable.

The general quality of water pumped from wells in the areas nearer the river and bay is shown in analyses C and D. This water is generally reported to be far more corrosive than the ground water in the areas farther from the river and bay, and where the chloride content is high the necessity of frequent replacement of ordinary bronze impellers on pumps has been reported. One user has apparently solved this problem by the use of impellers and pump bowls constructed of a high-nickel-content alloy. The highly mineralized water, of course, is generally not potable.

The high sulfate content of waters from some rock wells may be a function of the depth of the well. This may be explained by the fact that gypsum (calcium sulfate) has been observed in the cuttings taken from very deep wells. (See log of well 3, in appendix.) Gypsum has also been observed by the senior author in the cuttings from another deep well in Newark, and Meredith E. Johnson, New Jersey State Geologist, has observed gypsum in cuttings taken at 580 feet from a well drilled in the Brunswick formation near Westfield, New Jersey. In the cuttings from the bottom of the Celanese Corporation well, the gypsum occurred as large plates (1 1/2 by 1/2 by 1/8 inches) which had every appearance of having been the fillings of cracks. Presumably, therefore, gypsum, originally deposited in the cracks in the rock, has remained in the deeper cracks because it was not exposed to the circulation of meteoric waters.

Occasionally, wells drilled into the rocks of the Brunswick formation have yielded water of high mineral content upon completion. In such wells, it has sometimes been possible to lower the mineral content of the water by pumping the well heavily for a prolonged period. High mineral concentrations of this sort are probably caused by the ground water having been more or less stationary long enough to dissolve the mineral matter from the rock. Heavy pumping permits circulation of ground water and may induce a flow of water of lower mineral content toward the well. So far [illegible] known, no instances of this sort have been reported [illegible] the

(12)

Table 2.--Analyses of water from rock wells in the Newark area
(Results in parts per million)

Well	A	B	C	D	E	F
Color	0	0	0	0		
Total hardness as $CaCO_3$	300	282	380	2,870		
Dissolved solids	431	378	749	4,780		
Specific conductance, micromhos at 25° C.	669	614	1,220	6,960		
pH	7.2	7.6	7.5	7.3		
Silica (SiO_2)	22	20	18	31	34	
Iron (Fe)	.17	.13	1.1	.15		
Calcium (Ca)	105	67	111	865	340	426
Magnesium (Mg)	9.3	28	25	173	60	51
Sodium (Na)	19	16	87	447	18	48
Potassium (K)	1.8	2.7	2.8	7.0		
Carbonate (CO_3)	0	0	0	0		
Bicarbonate (HCO_3)	202	213	150	210	76	19
Sulfate (SO_4)	88	66	91	911	993	1,380
Chloride (Cl)	25	28	230	1,900	6.2	26
Fluoride (F)	.1	.1	.1	.0		
Nitrate (NO_3)	45	29	31	6.2		

Table 2.--Analyses of water from rock wells in the Newark area (continued)

A) From 310-foot well, Frick Bros. Creamery, Irvington, N. J.
Analysis by U.S.G.S., January 1948.

B) From 300-foot well, Hooton Chocolate Co., Newark, N. J.
Analysis by U.S.G.S., January 1948.

C) From 558-foot well, Kresge Dept. Store, Newark, N. J.
Analysis by U.S.G.S., January 1948.

D) From 805-foot well, P. Ballantine & Sons, well 1, plant 1, Newark, N. J.
Analysis by the U.S.G.S., January 1948.

E*) From 250-foot well, Celluloid Works, Newark, N. J. Analysis by P. Ballantine & Sons, 1879. (See Ann. Rept. New Jersey State Geologist for 1879, p. 127.)

F*) From 615-foot well, Lister Bros., Newark, N. J. Analysis by P. Ballantine & Sons, 1879. (See Ann. Rept. New Jersey State Geologist for 1879, p. 127.)

* Recalculated to p.p.m. by H. Herpers.

Reliable and detailed analyses of waters from wells pumping from the sand and gravel in the buried valley are not available at the present writing.

Salt-water intrusion

The infiltration of salt water into the body of fresh ground water is referred to as salt-water intrusion. In the Newark area it is believed to be caused principally by heavy pumping in areas adjacent to Newark Bay and the Passaic River. Heavy pumping lowers the general ground-water levels, creating a difference in head between the ground-water body and the nearby bay and river, inducing a flow of salt water into the water-bearing formations. Another factor that probably contributes to salt-water intrusion is the dredging of ship channels in the Passaic River and Newark Bay. As mentioned previously in the discussion of the hydrology of the Recent deposits, those deposits act as an imperfect barrier to the infiltration of salt water into the underlying materials. It is not improbable, therefore, that the deepening of ship channels in the river and bay has contributed to the breaking of the imperfect seal formed by the Recent (and, in some places, Pleistocene) deposits. In the areas of salt-water intrusion, the water in both the unconsolidated materials and the rocks is affected.

The attached map (figure 5) shows the distribution of the chloride content of the ground water in the area. Most of the data upon which the map was based were provided by the Newark City Chemist, through the courtesy of Dr. Charles V. Craster, Health Officer of the City of Newark. As almost all the analyses were made in 1942, when the City of Newark made a survey of certain qualities of the waters from wells in the city, the map presents a picture of the chloride content of the ground water at that time. Recent check analyses made in the investigation preceding this report, confirm generally the distribution of chloride shown. The curved lines represent points of equal chloride concentration.

Several areas of ground water with high chloride concentrations are shown, and all are in areas of relatively [illegible] pumpage. The first of these is along the Passaic [illegible] near the northern boundary of Newark, where there [illegible] industries that use well water in processing. The pumpage here is not as heavy as in the other areas, and great amounts of river water have not been drawn into the ground-water body. Mention might here be made of the single well near the bank of the Passaic River, just south of the area, marked A on figure 5, the water from which contained 1,710 parts of chloride per million. This well pumps from a gravel bed about 45 feet below the surface which is probably in direct hydraulic connection with the river.

The second area of high chloride concentration is near the intersection of Harrison Avenue and McCarter Highway. Here, fairly heavy pumpage has induced an inflow of water from the river.

The third area, near the intersection of Raymond Boulevard and Broad Street, contains several wells that pump large amounts of water, principally for air-conditioning.

The fourth and largest area with high concentrations of chloride in well waters is in the eastern part of the Newark area and is bounded roughly by Harrison Avenue on the north; by Fourth Street, extended to Port Street on the west; by Port Street on the south; and by the Passaic River and Newark Bay on the east. The area contains many industries that require large amounts of ground water for cooling and processing. Heavy pumping, continued over a period of many years, has caused the depression of the upper surface of the ground-water body, which has, in turn, led to river-water intrusion on a large scale. That the present character of the water in this area is materially different from its original character can be seen by comparison of analyses D, E, and F (See table 2 on p. 38) Analysis D was made of water taken from a well of P. Ballantine & Sons in January 1948, whereas analyses E and F, made in 1879, are of water taken from wells not far from the Ballantine plant. Analyses E and F show that the ground water in this section originally had a chloride content comparable to that of water taken from wells in areas away from the river and bay.

About 4,000 feet northeast of the intersection of State Highway 25 and Port Street a great concentration of chloride was found in three wells belonging to a single company. Some of the differences in ch[illegible] content in this area may be due to differences in [illegible]. The

highest concentration (2,700 p.p.m.) was encountered in a well 535 feet deep, whereas lower concentrations were found in nearby shallower wells. At the time the deep well was drilled, it was thought that the highly saline water might be caused by a pocket of stationary ground water, which had acquired its high salt content from the formation because of a lack of normal ground-water movement in the vicinity. On the basis of this assumption, the well was pumped steadily at a high rate of discharge for a few weeks with the idea of pumping out the pocket of highly mineralized water and inducing a flow of fresh water into the well. The results were inconclusive and the well was finally abandoned because of the unsatisfactory quality of the water.

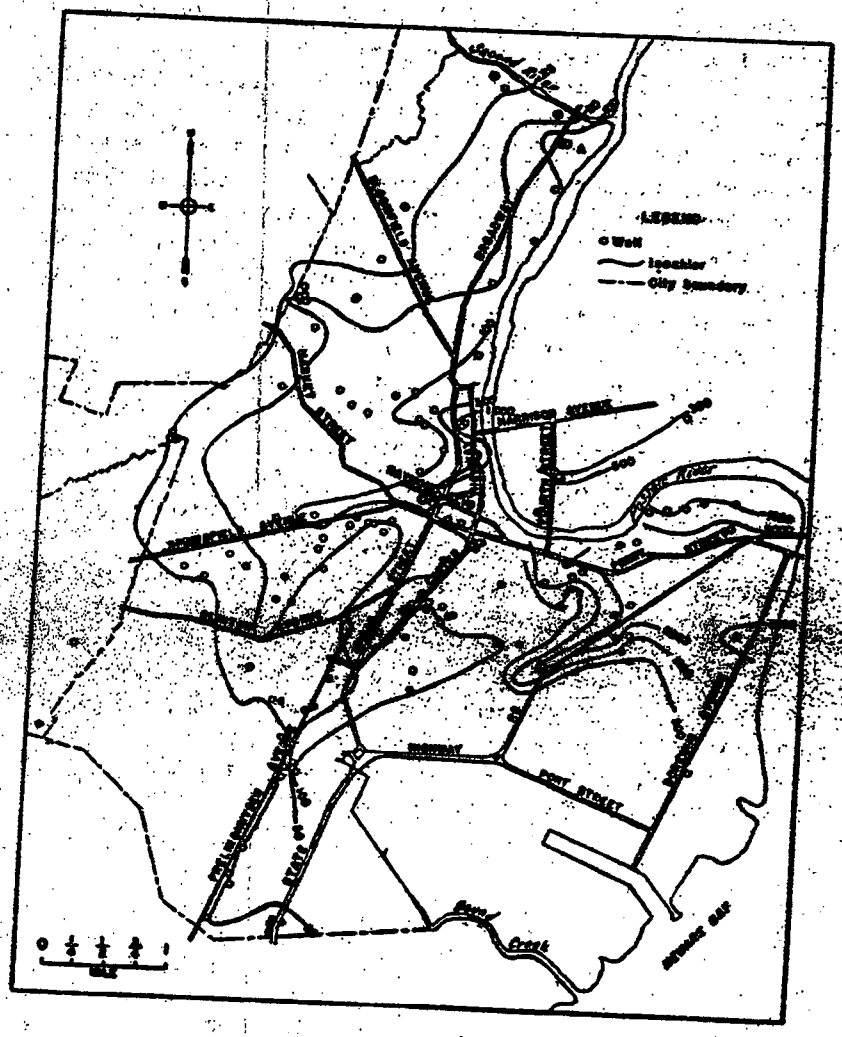

Figure 5.-Map showing chloride content of the ground water beneath Newark, N. J., and vicinity.

Temperature of the ground water

The average temperature of the ground water in the Newark area is approximately 55° F. The temperature of ground water, except as explained below, is largely a function of the depth of the aquifer from which it is drawn, and of the mean annual temperature of the air, which at Newark is 52.3° F. Water from very shallow wells will usually vary in temperature over the year. Water from somewhat deeper wells, however, has a temperature that, for all practical purposes, is equal to the mean annual temperature. The effect of the mean annual temperature on the temperature of ground water does not extend to great depths. It is known from numerous deep wells, mines, and test borings that the temperature of the earth's crust increases with depth. The rate at which the ground temperature increases with depth, known as the geothermal gradient, varies, depending upon many conditions, but generally an increase of 50 to 150 feet in depth will raise the temperature 1° F. Of course, in regions of active volcanism this rate of increase does not apply. In the Newark area the normal geothermal gradient is not known as all temperature measurements have been made at the point of discharge of the pumps. Each measurement, therefore, represents merely the temperature of the water issuing from the well, which is probably an average of the temperatures of water at all producing levels.

CONCLUSIONS

The studies that preceded this report were not detailed or prolonged enough to arrive at definite answers to important questions that arise with regard to the safe yield of the aquifers in the Newark area. Only very tentative conclusions can be made at this time. Observations and studies should be continued over a period of years in order that the safe yield may be defined.

Continuing observations should be made of the pumping rate in every well in the area and of the water levels in [illegible] adequate number of observation wells so that the rate [illegible] direction of flow in the aquifers and the amount of recharge to them may be defined. Periodic analyses of the water from representative wells throughout the area should be made in order to detect changes in its quality and especially to define the intrusion of salt water. Geologic information should be sought to extend our knowledge of the buried channel that passes through the area and of the materials that fill it. Whenever wells or other deep excavations are made, particular attention should be given to the nature of the material overlying the rock in order to establish its geologic and hydrologic characteristics more fully, and ultimately to define the best areas of recharge.

In many parts of the area conclusive data are not available, but it seems probable that there are localities where additional quantities of ground water may be obtained. It also seems probable that in some heavily pumped parts of the area the safe yield is being approached or has already been exceeded. For example, in the area around the plants of P. Ballantine & Sons and the Celanese Corporation of America, the water levels have been lowered to such an extent that it seems unlikely that any substantial additional quantity of water can be withdrawn from the ground safely or economically. The quality of the ground water in this area is already unfit for some uses.

The experiments with artificial recharge at the Ballantine plant during the last two years offer promise of great improvement in the ground-water conditions in some parts of the area if water is available for continuing such recharge. This is certainly sound conservation practice and should be expanded as much as possible. Whenever recharging is undertaken in the future, careful observations should be made of water levels and of the quality and quantity of water recharged and withdrawn, in order to evaluate the effects more closely and to trace the movement of the water.

APPENDIX I - SELECTED WELL LOGS (CONT.)

2. Log of well 2 drilled for John Nieder, 247 Emmet Street, Newark, N. J., by Layne-New York Co. Log furnished by Mr. W. A. North of Layne-New York Co.

Depth	Thickness	Description	Correlation
0' - 3'	3'	Concrete	Recent
3' - 5'	2'	Cinders	Fill
5' - 15'	10'	Yellow clay	Recent ?
15' - 27'	12'	Fine red sand	Glacial drift
27' - 55'	28'	Red quicksand	"
55' - 80'	25'	Tough red clay	"
80' - 125'	45'	Soft red clay	"
125' - 190'	65'	Red sandy clay	"
190' - 210'	20'	Soft red clay	"
210' - 215'	5'	Hardpan	"
215' - 225'	10'	Sand and clay	"
225' - 408'	183'	Red rock	Triassic

APPENDIX I - SELECTED WELL LOGS

1. Log of well 2, drilled for Driver Harris Co., Harrison, N. J., by C. W. Lauman & Co. Log furnished by C. W. Lauman & Co.

Depth	Thickness	Description	Correlation
0' - 21'6"	21'6"	Fill	Fill
21'6" - 30'10"	9'4"	Sand and gravel	Glacial drift
30'10" - 39'0"	8'2"	Coarse sand and gravel	"
39'0" - 41'10"	2'10"	Streaks of hard red clay and gravel	"
41'10" - 58'2"	16'4"	Red clay, fine sand and gravel	"
58'2" - 62'2"	4'0"	Clay and gravel	"
62'2" - 71'9"	9'7"	Hard red clay and broken rock	"
71'9" - 82'0"	10'3"	Red clay and fine sand	"
82'0" - 112'11"	30'11"	Red clay and rock	"
112'11" - 135'0"	22'1"	Red clay	"
135'0" - 141'0"	6'0"	Hard packed sand	"
141'0" - 155'0"	14'0"	Red clay	"
155'0" - 166'0"	11'0"	Clay, sand, and gravel	"
166'0" - 173'3"	7'3"	Hardpan	"
173'3" - 176'3"	3'0"	Clay, fine sand, and gravel	"
176'3" - 187'3"	11'0"	Cemented sand and gravel	"
187'3" - 192'3"	5'0"	Fine brown sand and clay	"
192'3" - 212'10"	20'7"	Red clay	"
212'10" - 222'6"	9'8"	Sand, gravel, and red clay	"
222'6" - 225'6"	3'0"	Coarse sand and gravel	"
225'6" - 231'6"	6'0"	Clay and gravel	"
231'6" - 234'6"	3'0"	Coarse sand and small gravel	"
234'6" - 240'0"	5'6"	Clay and sand	"
240'0" - 243'0"	3'0"	Coarse brown sand, gravel, and some clay	"
243'0" - 253'0"	10'0"	Medium coarse red sand and grit	"
253'0" - 270'0"	17'0"	Red clay and gravel	"
270'0" - 291'0"	21'0"	Hard clay, sand, and large gravel	"
291'0" - 292'0"	1'0"	Medium coarse sand and large gravel	"
292'0" - 337'0"	45'0"	Red Shale	Triassic

APPENDIX I - SELECTED WELL LOGS (CONT.)

3. Log of well 27 drilled for Celanese Corporation of America by Layne-New York Co. Compiled by H. Herpers from samples furnished by Wm. E. Helmstaedter, Mechanical Engineer, Celanese Corporation of America.

Depth	Thickness	Description	Correlation
2' - 27'	25'	Fine-grained red-brown sand	Glacial drift
27' - 32'	5'	Coarse gravel composed of red shale (to 1/2 in.)	"
32' - 71'	39'	Fine-grained red sandy clay	"
71' - 354'	283'	Red shale	Triassic
354' - 365'	11'	Red shale (softer than last)	"
365' - 377'	12'	Soft red shale (similar to last)	"
377' - 419'	42'	Fine-grained red sandstone	"
419' - 537'	118'	Red shale	"
537' - 580'	43'	Red shale (softer than last)	"
580' - 650'	70'	Very soft red shale	"
650' - 695'	45'	Soft red shale with some gypsum grains	"
695' - 725'	30'	Red shale. A few gypsum grains	"
725' - 730'	5'	Fine-grained red sandstone	"
730' - 787'	57'	Red shale with some gypsum grains	"
787' - 796'	9'	Fine-grained red shaly sandstone with gypsum grains	"
796' - 840'	44'	Red shale	"
840' - 856'	16'	Red sandy shale with large (1-1/2 in. x 1 in. x 1/8 in.) plates of gypsum, which appear to have been deposited in fractures in rock	"

APPENDIX I - SELECTED WELL LOGS (CONT.)

4. Log of test boring No. 19, made at crossing of Route 25 addition and Lehigh Valley R. R. yards by Giles Drilling Co. for State Highway Department. Compiled by H. Herpers from inspection of samples.

Depth	Description	Correlation
0' - 3'	Cinders	Fill
4' - 5'	Cinders and meadow muck	Fill and Recent
10' - 11'	Cinders, gray clay, and meadow muck	"
16' - 17'	Gray, slightly sandy clay	Recent
20' - 21'	Red and gray clay and medium sand	Recent (reworked glacial drift)
30' - 31'	Fine red silty sand	Glacial drift
40' - 41'	Red clay	"
50' - 51'	Red sandy clay	"
60' - 61'	Red sandy clay and red shale (top of rock)	Triassic
61' - 71'	Red shale (core)	"

Reference 11

PROJECT NOTE **REGION II SITE ASSESSMENT TEAM**

To: Cellofilm Corporation File **Date:** April 1, 2003

From: Michele Capriglione, Region II SAT

Subject: Site Geology

REFERENCES

Attachment A - Bedrock Geologic Map of Northern New Jersey, 1996

Attachment B - Hydrogeologic Character and Thickness of the Glacial Sediment of NJ; NJ Geological Survey, Sheet 1 of 2, 1990

Attachment C - Hydrologic Character and Thickness of the Glacial Sediment of NJ; NJ Geological Survey, Sheet 2 of 2, 1990

Based upon information obtained from the above reference, M. Capriglione determined the site specific geology:

Glacial Deposits:	0 feet - 50 feet below ground surface
Passaic Formation:	50 feet - 11,819 feet below ground surface

Michele Capriglione

Michele Capriglione

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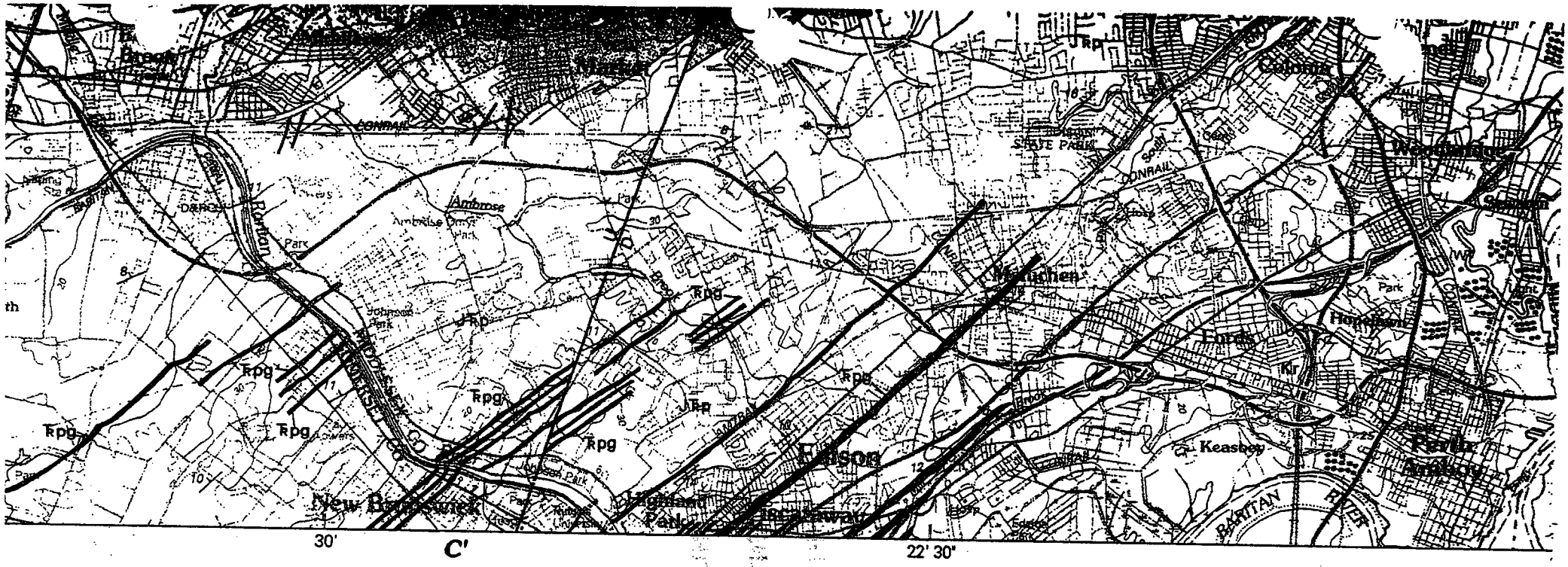
Attachment A



BEDROCK GEOLOGIC MAP OF NORTHERN NEW JERSEY

By

Avery Ala Drake, Jr.,[1] Richard A. Volkert,[2] Donald H. Monteverde,[2] Gregory C. Herman,[2] Hugh F. Houghton,[2] Ronald A. Parker,[1] and Richard F. Dalton[2]

1996

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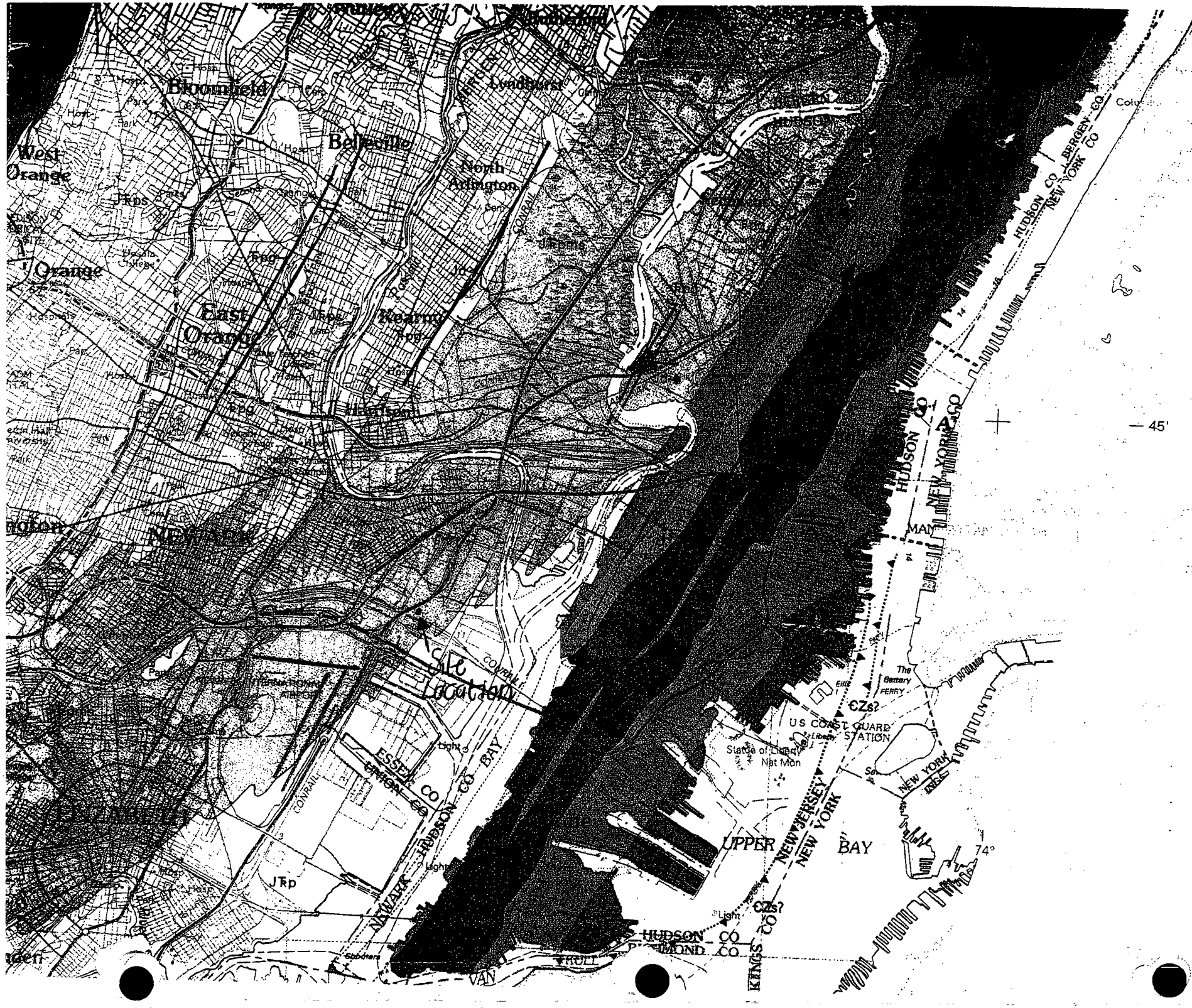

Bloomfield
Belleville
North Arlington
Lyndhurst
West Orange
Orange
East Orange
Kearny
Harrison
NEWARK
Site Location
ESSEX CO
UNION CO
HUDSON CO
BAY
NEWARK
CONRAIL
HUDSON CO
BERGEN CO
NEW YORK CO
HUDSON CO
NEW YORK CO
MAN
The Battery
FERRY
US COAST GUARD STATION
Statue of Liberty Nat Mon
NEW YORK
NEW JERSEY
NEW YORK
UPPER BAY
74°
45'
HUDSON CO
RICHMOND CO
KINGS CO
HULL
VAN

4

Lower part of the uppermost flow has pillow structures; upper [illegible]ahoehoe flow structures. Tops and bottoms of flow layers are vesic[illegible]. Maximum thickness is about 182 m (597 ft)

Passaic Formation (Lower Jurassic and Upper Triassic) (Olsen, 1980)—Reddish-brown to brownish-purple and grayish-red siltstone and shale (J₮p) maximum thickness 3,600 m (11,810 ft). At places contains mapped sandy mudstone (J₮pms), sandstone (J₮ps), conglomeratic sandstone (J₮psc) and conglomerate containing clasts of quartzite (J₮pcq), or limestone (J₮pcl). Formation coarsens up section and to the southwest. Quartzite conglomerate unit (J₮pcq) is reddish-brown pebble conglomerate, pebbly sandstone, and sandstone in upward-fining sequences 1 to 2 m (3–6 ft) thick. Clasts are subangular to subrounded, quartz and quartzite in sandstone matrix. Sandstone is medium to coarse grained, feldspathic (up to 20 percent feldspar), and locally contains pebble and cobble layers. Conglomerate thickness exceeds 850 m (2,790 ft). Limestone conglomerate unit (J₮pcl) is a medium-bedded to massive, pebble to boulder conglomerate. Clasts are subangular dolomitic limestone in matrix of brownish- to purplish-red sandstone to mudstone; matrix weathers light gray to white near faults. Maximum thickness unknown.

Conglomeratic sandstone (J₮psc) is brownish-red pebble conglomerate, medium- to coarse-grained feldspathic sandstone, and micaceous siltstone; unit is planar to low-angle trough cross laminated, burrowed, and contains local pebble layers. Unit forms upward-fining sequences 0.5 to 2.5 m (1.6–8 ft) thick. Conglomeratic sandstone thickness exceeds 800 m (2,625 ft). Sandstone (J₮ps) is interbedded grayish-red to brownish-red, medium- to fine-grained, medium- to thick-bedded sandstone and brownish- to purplish-red, coarse-grained siltstone; unit is planar to ripple cross laminated, fissile, locally calcareous, contains desiccation cracks and root casts. Upward-fining cycles are 1.8 to 4.6 m (6–15 ft) thick. Sandstone beds are coarser and thicker near conglomerate units (J₮pcq, J₮pcl). Maximum thickness about 1,100 m (3,610 ft).

Sandy mudstone (J₮pms) is reddish-brown to brownish-red, massive, silty to sandy mudstone and siltstone, which are bioturbated, ripple cross laminated, and interbedded with lenticular sandstone. To southwest where similar lithologic units also occur, they have not been mapped separately, but have been included in undivided unit J₮p. Rhythmic cycles 2 to 7 m (7–23 ft) thick of gray-bed sequences (₮pg), termed Van Houten cycles by Olsen (1985), contain basal thin-bedded to finely laminated shale to siltstone, which grade upward through laminated to microlaminated, locally calcareous mudstone to siltstone and finally into massive silty mudstone. Lowest part of cycle has some desiccation features and local fossils; middle part has highest organic content and the most fossils; highest part contains mudcracks, burrows, and root casts. Gray-bed cycles are abundant in lower half of Passaic Formation and less common in upper half. Rocks of the Passaic Formation have been locally thermally metamorphosed to hornfels where in contact with the Orange Mountain Basalt, diabase dikes, and sheetlike intrusions. Total thickness of formation ranges from 3,500 to 3,600 m (11,480–11,810 ft)

Lockatong Formation (Upper Triassic) (Kümmel, 1897)—Cyclically deposited sequences consisting of light- to dark-gray, greenish-gray, and [illegible]iferous sandstone and pebble conglomerate. Basal conglo[illegible] beds are interbedded with siltstone similar to the upper part o[illegible]pus Formation and contain well-sorted, subangular to subrounded, [illegible] and white quartz pebbles less than 1 cm (0.4 in.) long. Lower contact gradational. About 14 m (46 ft) thick

Esopus Formation (Vanuxem, 1842; Boucot, 1959)—Light- to dark-gray, laminated to thin-bedded siltstone interbedded with dark-gray to black mudstone, dusky-blue sandstone and siltstone, and yellowish-gray, fossiliferous siltstone and sandstone. Lower contact probably conformable with the Connelly Conglomerate. The formation is about 100 m (330 ft) thick at Greenwood Lake and estimated at 55 m (180 ft) thick in Longwood Valley

Connelly Conglomerate (Chadwick, 1908)—Grayish-orange weathering, very light gray to yellowish-gray, thin-bedded quartz-pebble conglomerate. Quartz pebbles average 1 to 2 cm (0.4–0.8 in.), are subrounded to well rounded, and well sorted. The unit unconformably overlies the Berkshire Valley Formation. About 11 m (36 ft) thick

Berkshire Valley and Poxono Island Formations, undivided (Upper Silurian)—Thickness ranges from 76 m (250 ft) at Greenwood Lake to 122 m (400 ft) in Longwood Valley

Berkshire Valley Formation (Barnett, 1970)—Commonly yellowish-gray-weathering, medium-gray to pinkish-gray, very thin to thin-bedded fossiliferous limestone interbedded with gray to greenish-gray calcareous siltstone and silty dolomite, medium-gray to light-gray dolomite conglomerate, and grayish-black, thinly laminated shale. Lower contact conformable. Thickness ranges from 27 to 38 m (90–125 ft) thick

Poxono Island Formation (White, 1882; Barnett, 1970)—Very thin to medium-bedded sequence of medium-gray, greenish-gray, or yellowish-gray, mud-cracked dolomite; light-green, pitted, medium-grained calcareous sandstone, siltstone, and edgewise conglomerate containing gray dolomite; and quartz-pebble conglomerate containing angular to subangular pebbles as much as 2 cm (0.8 in.) long. Interbedded grayish-green shales at lower contact are transitional into underlying Longwood Shale. Thickness ranges from 49 to 84 m (160–275 ft) thick

Longwood Shale (Upper and Middle Silurian) (Darton, 1894)—Dark-reddish-brown, thin- to very thick bedded shale interbedded with cross-bedded, very dark red, very thin to thin-bedded sandstone and siltstone. Lower contact conformable. About 100 m (330 ft) thick

Green Pond Conglomerate (Middle and Lower Silurian) (Rogers, 1836)—Medium- to coarse-grained quartz-pebble conglomerate, quartzitic arkose and orthoquartzite, and thin- to thick-bedded reddish-brown siltstone. Grades downward into gray, very dark red, or grayish-purple, medium- to coarse-grained, thin- to very thick bedded pebble to cobble conglomerate containing clasts of red shale, siltstone, and chert; yellowish-gray sandstone and chert; dark-gray shale and chert; and white-gray and pink milky quartz. Quartz cobbles are as long as 10 cm (4 in.), and rare red shale clasts are as much as 46 cm (18 in.) across. Milky quartz pebbles [illegible]

Attachment B

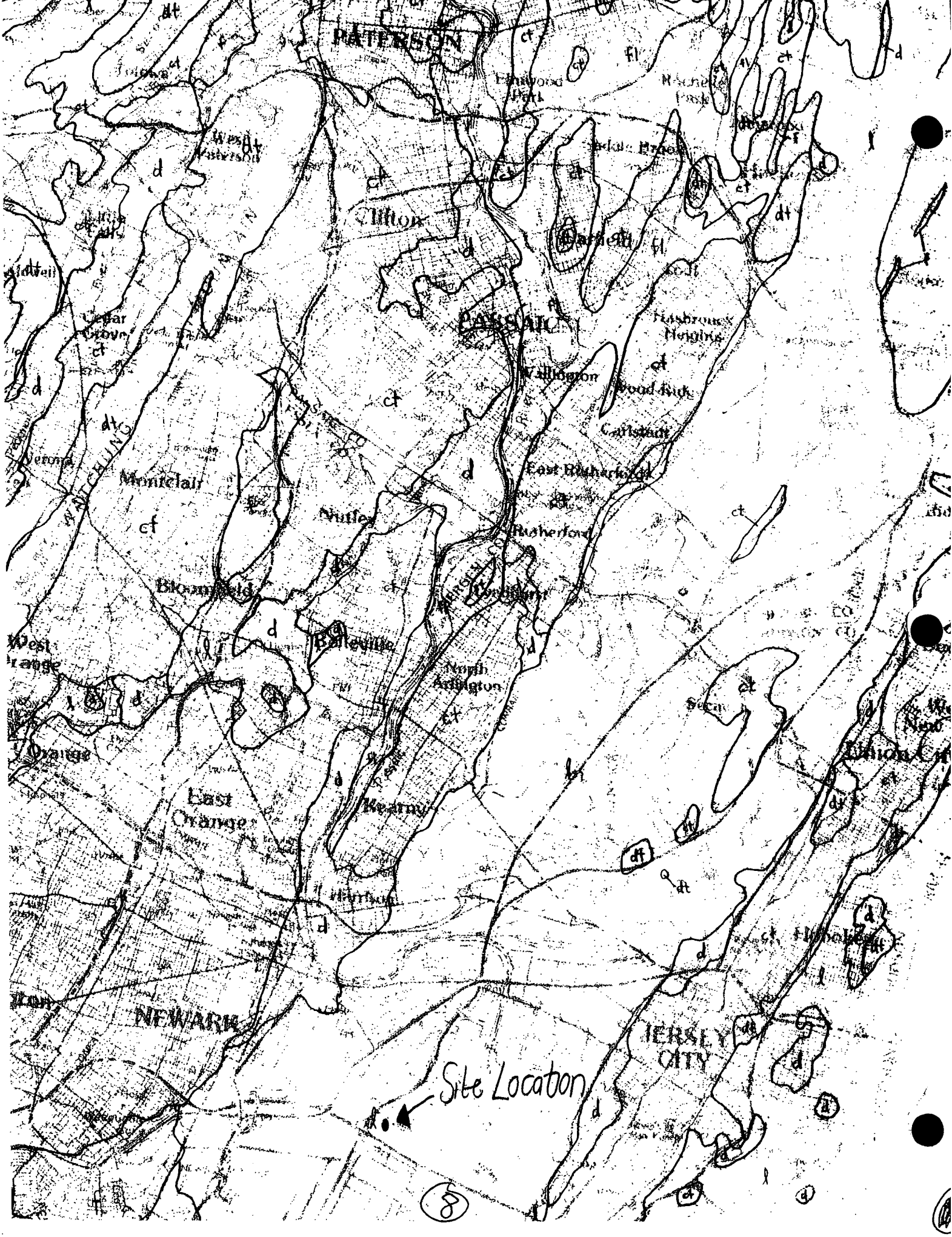
Division of Water Resources
NJ Geological Survey

Sheet 1 of 2

Hydrogeologic Character & Thickn
of the Glacial Sediment of NJ
NJ Geological Survey 1990

Symbol	Unit	Description	Hydrogeologic Character
ct	continuous till	Continuous till generally greater than 20 feet thick. May be as much as 200 feet thick. Grain size of matrix generally reflects underlying bedrock. Silty sand to sandy till forms on gneiss, sandstone, quartzite, and conglomerate; silty till forms on shale, carbonate, basalt, and diabase; silty clay till forms locally on shale and on Cretaceous clay.	May be a local unconfined aquifer where thick and sandy. the Passaic basin between Summit and Morristown till overli productive, confined lacustrine fan and fluvial sand and gra aquifers in places.
dt	discontinuous till	Discontinuous till generally less than 20 feet thick, numerous bedrock outcrops.	No significant surficial aquifer overlying bedrock.
m	morainic deposits	Till, sandy diamict, and minor sand and gravel deposited as ridges and knolls along former ice margins. May interbed with and overlie fluvial, deltaic, lacustrine fan, and lake-bottom sediment where moraines traverse valleys and glacial lake basins. May be as much as 200 feet thick.	May be a local unconfined aquifer where thick; productive confined and semi-confined aquifers may occur beneath mora deposits in glacial lake basins.
l	lake-bottom sediment	Silt, clay, and fine sand deposited on the bottoms of glacial lakes. As much as 250 feet thick.	Generally a confining or semi-confining layer. Underlain by productive confined and semi-confined lacustrine fan and fluvial aquifers in places.

7


PATERSON
Clifton
Garfield
PASSAIC
Wallington
Rutherford
East Rutherford
Nutley
Montclair
Bloomfield
Belleville
North Arlington
West Orange
Orange
East Orange
Kearny
NEWARK
JERSEY CITY
Site Location

Attachment C

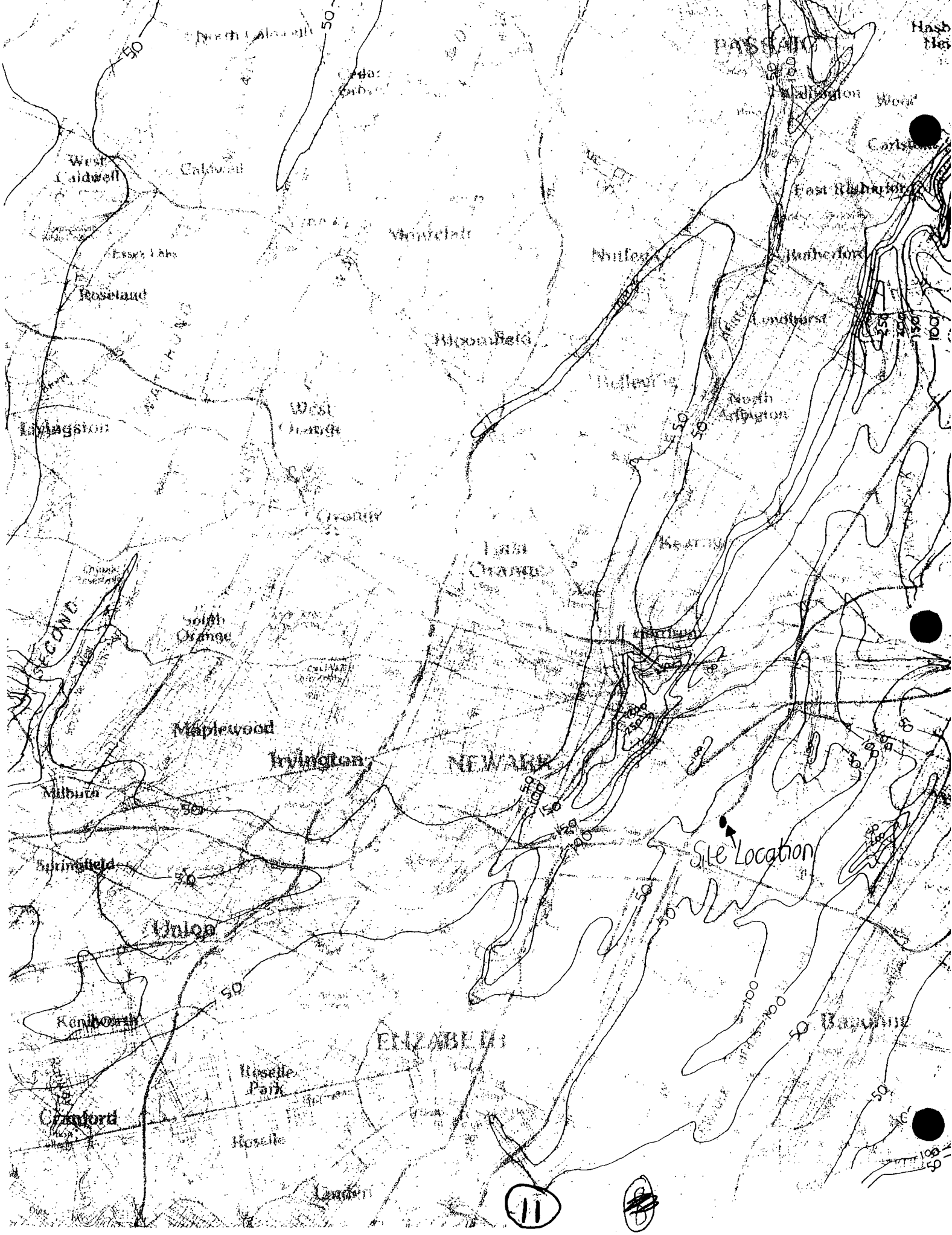
Hydrogeologic Character & Thickness of the Glacial Sediment of NJ
Sheet 2 of 2 1990

HYDROGEOLOGIC CHARACTER AND THICKNESS OF THE GLACIAL SEDIMENT OF NEW JERSEY

OPEN FILE MAP NO. 3

SHEET 2 OF 2

10



PASSAIC
Wallington
Carlstadt
East Rutherford
Rutherford
Lyndhurst
North Arlington
Kearny
West Caldwell
Caldwell
Montclair
Nutley
Roseland
Bloomfield
Belleville
Livingston
West Orange
Orange
East Orange
South Orange
SECOND
Maplewood
Irvington
NEWARK
Milburn
Springfield
Union
Kenilworth
ELIZABETH
Roselle Park
Cranford
Roselle
Linden
Bayonne
Site Location
50
100
150
250

11

Reference 12

PROJECT NOTE	REGION II SITE ASSESSMENT TEAM

To: Cellofilm File **Date:** December 6, 2004 **Page:** 1 of 3

W.O. No.: 20103.001.001.1078.00

From: Michele Capriglione, Region II SAT

Subject: Site Block and Lot

This project note documents the address, owner, and block and lot of the Cellofilm Corporation site as determined from tax maps (attached to this note) obtained from the Newark Tax Assessors Office located at 920 Broad Street, Newark, NJ.

The Cellofilm Corporation site is located at 45-5 Cornelia Street Newark, NJ; Block 2452, Lot 24.

The owner of the Cellofilm Corporation site is:
Cellomer Corporation
P.O. Box 13582
North Carolina 27709

Michele Capriglione
Michele Capriglione

---------OWNER INFORMATION---------
CELLOMER CORPORATION CE
P.O. BOX 13582
NORTH CAROLINA 27709

DED AMT #OWN 01
K# MORT# SS#

---------PROPERTY INFORMATION---------
PROP LOC: 45-5 CORNELIA ST.
PROPERTY CLASS 4A ACCOUNT#
BLDG DESC
LAND/ACRE 503.6X108 / 1.24
ADDITIONL LOTS

ZONE MAP USER#1 #2 EW
BULT 0000 UNITS BCLASS
VCS **** SFLA ****

----------SALES INFORMATION----------

	DATE	BOOK	PAGE	PRICE	PCD NU	4TYPE
CUR:						
-1:						
-2:						

-----TENANT REBATE----

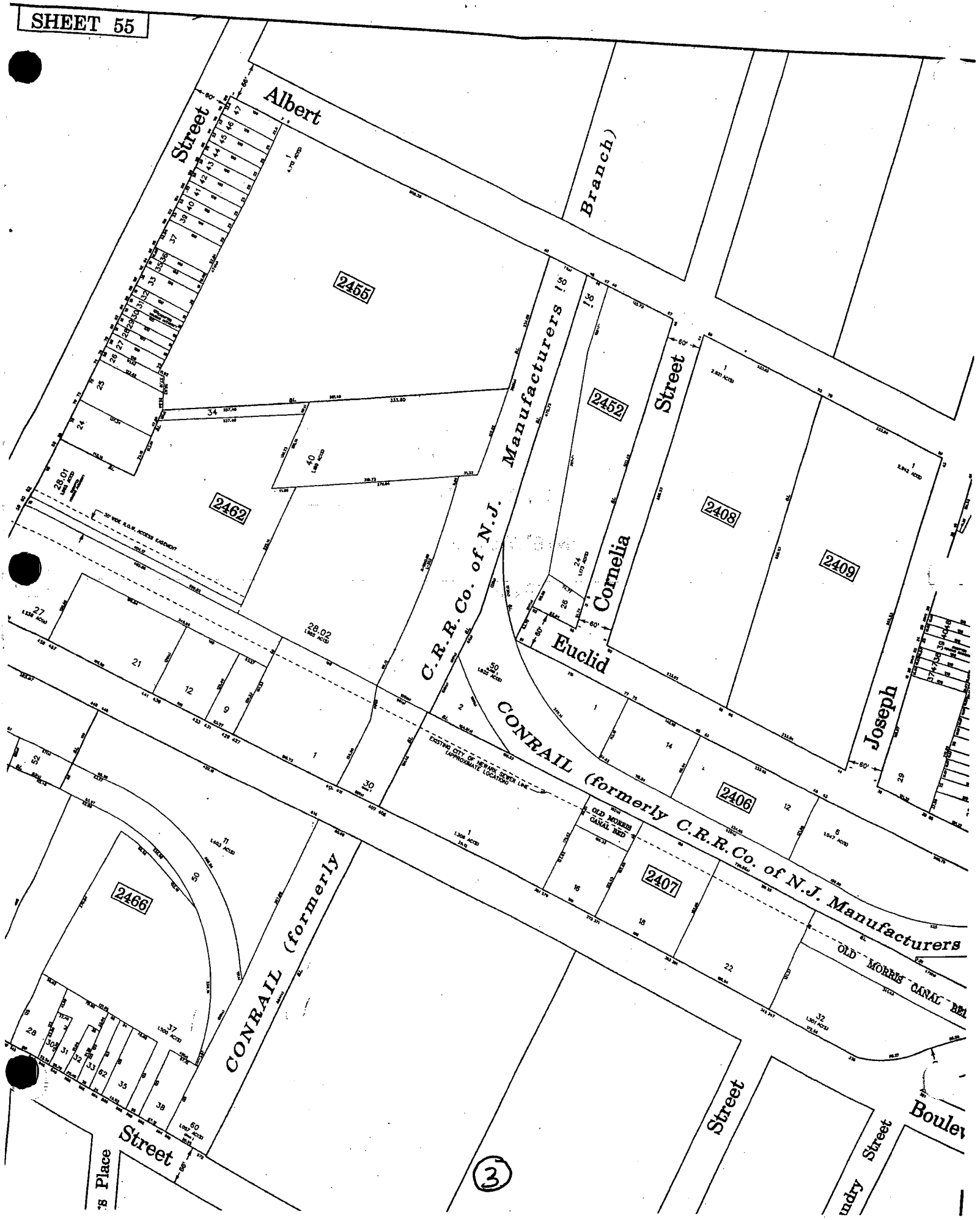
BASE YR	TAXES	FLAG
03	23744.88	N

---VALUES---
LAND 1026000
IMPR 73300
EXM1
EXM2
EXM3
EXM4
NET 1099300
OLDID:

--------TAXES--------
03 TOTAL 23744.88
04 HALF1 11872.44
04 TOTAL .00
05 HALF1 .00
SPECTAX CDS:

-------EXEMPT PROPERTY DATA-------
EPL CD STAT.
FACILITY
INIT FILE FUR FILE
ASMT CODE

NEXT ACCESS: BLK LOT QUAL
ENTER=PROC.CHANGE F1=NO ACTION F3=ASSMT HISTORY F5=RECORD CARD


SHEET 55
Albert
Street
Branch)
2455
2452
Street
2462
2408
2409
C.R.R.Co. of N.J. Manufacturers
Cornelia
Euclid
Joseph
CONRAIL (formerly C.R.R.Co. of N.J. Manufacturers
EXISTING CITY OF NEWARK SEWER LINE (APPROXIMATE LOCATION)
OLD MORRIS CANAL BED
2406
2407
2466
CONRAIL (formerly
OLD MORRIS CANAL BED
Street
Street
Boulev
Street
Place
3

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Reference 13

DRAFT

NJD 000 813 451
CE 93 9.10.93

COMPLIANCE EVALUATION INSPECTION (CEI)
CELLOFILM CORPORATION
(LOCATION NOW OCCUPIED BY REICHHOLD CHEMICALS, INC.)
NEWARK, NEW JERSEY
WORK ASSIGNMENT R02035

DRAFT

TABLE OF CONTENTS

Section | Page

1.0 INTRODUCTION 1

2.0 SITE BACKGROUND 1

2.1 Facility Description and Operation 1

2.2 Hazardous Waste Generation 2

3.0 ONSITE OBSERVATIONS 3

3.1 Identification of Hazardous Waste 3

3.2 Examination of Paperwork 3

4.0 CONCLUSIONS 3

ATTACHMENTS

New Jersey Generator Inspection Report
New Jersey Hazardous Waste Inspection Report

1.0 INTRODUCTION

In accordance with RCRA policy, hazardous waste transporter, generator, or treatment/storage/disposal (TSD) facilities are subject to Compliance Evaluation Inspections (CEI) which address facility environmental concerns. The inspections are conducted to evaluate compliance with all applicable standards promulgated under 40 CFR Parts 262 through 268.

Under TES V Work Assignment R02035, CDM Federal Programs Corporation (CDM Federal) was contracted to conduct a CEI at the Cellofilm Corporation facility in Newark, New Jersey. Aaron Frantz of CDM Federal visited Cellofilm Corporation on September 10, 1993 to conduct the CEI. The information within this report was obtained from facility personnel and onsite records during the CEI, except where referenced otherwise.

The CEI was conducted using (as appropriate) the New Jersey Generator Inspection Report and the New Jersey Hazardous Waste Inspection Report. These documents were used as a basis for the inspection. All pertinent information is recorded in the inspection narrative. When necessary, relevant checklists were completed to provide additional detail when specific concerns were encountered during the inspection.

2.0 SITE BACKGROUND

2.1 FACILITY DESCRIPTION AND OPERATIONS

Cellofilm is not located at the address provided by EPA. Presently, the location is occupied by Reichhold Chemicals Inc.

The Reichhold facility consists of three buildings and is located on approximately two acres at the intersection of Albert Avenue and Cornelia Street in Newark, New Jersey. The production operations are situated on the northwest corner of the intersection and the product transportation operation is situated on the southwest corner of the intersection.

Cellofilm previously operated at the southwest corner of the intersection from 1968 to 1984. Cellofilm performed specialty operations regarding the manufacturing of nitrocellulose. In 1984, the facility was acquired by Polychrome, Inc. (Polychrome). A description of Polychrome's was not obtained.

In March 1989, Reichhold acquired the Cellomer Corporation (Cellomer), which was located at the northwest corner of the aforementioned intersection. Cellomer manufactured alkyd resins, which is the process currently performed by Reichhold. During the March 1989 acquisition, Reichhold also acquired the adjacent Polychrome facility.

Currently, alkyd resins are produced by Reichhold on the northwest corner of the intersection. Reichhold's product transportation operation is performed out of the former Cellofilm location, which is at the intersection's southwest corner.

In summary, the alkyd resins are produced in batches by mixing glycerol and phthalic anhydride. Solvents are also added to the resin to control the viscosity of the product. Six reactors are onsite to perform the batch operations. The batches are filtered with presses to remove solids from the product.

The inspection consisted of meeting the facility representative to obtain a description of the site operations, conducting a facility tour and reviewing facility documents . Facility representative Mike (Yogesh) Baxi was present during the inspection. As previously presented, the EPA ID# of Reichhold is NJD048797195.

2.2 HAZARDOUS WASTE GENERATION

Reichhold generates hazardous wastes form several different points in the facility operations. First, the reactors process lines are cleaned periodically with solvent. The solvent is captured, classified as D001/F003/F005, and shipped to a disposal facility. Sometimes the process line cleaning is performed using methyl ethyl ketone (MEK) and the D035 waste code is included in the waste classification. Second, if an off-specification batch can not be reworked into production, the batch is disposed of as a hazardous waste. Last, a parts/tool cleaning station, which generates a waste solvent, is located in the facility garage.

The waste solvents and resins from the cleaning operations and the off-specification resins are handled by Cycle Chem of Elizabeth, New Jersey. The facility previously used Oldover Corporation (Oldover) of Arvonia, Virginia for the disposal of these types of waste. However, Oldover only accepted bulk quantities of waste, and Reichhold only generates drum quantities of waste due to institution of a reblending program.

The parts/tool cleaning solvents are handled by Safety Kleen of Newark, New Jersey.

Reichhold also generates a nonhazardous solid waste from their process. The nonhazardous waste is the filter cake from the presses used to finish the product. The filter cake is handled by GSX Laidlaw Corporation located in Pinewood, South Carolina.

DRAFT

3.0 ON-SITE OBSERVATIONS

3.1 IDENTIFICATION OF HAZARDOUS WASTES

On September 24, 1993 the hazardous wastes that were being stored at the Reichhold facility were inspected. The facility maintains a hazardous waste storage area and two satellite accumulation areas. The following wastes were identified in the storage area:

- six 55 gallon drums of solid resin,
- eleven 55 gallon drums of waste resin,
- three 55 gallon drums of waste solvent, and
- four 55 gallon drums of waste resin solution.

Approximately 20 gallons of waste resin solution in a steel 55 gallon drum were identified in the satellite accumulation area by the control lab. Approximately 20 gallons of waste solvent in a steel 55 gallon drum were observed in the satellite accumulation area in the pilot room.

3.2 EXAMINATION OF PAPERWORK

All manifesting and notification requirements were complete. The facility maintains a contingency plan and training records were made available for review.

4.0 CONCLUSIONS

No areas of concern or potential violations were observed during this inspection. Also, no areas that may pose a threat to human health or the environment were identified.

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Reference 14

WESTON
MANAGERS DESIGNERS/CONSULTANTS

M. Capriglione
Originator

PHONE CONVERSATION RECORD

Conversation with:
Name Supervisor of the City
Company of Newark Sewers
Address

Phone 1-973-733-5970

Date 9, 23, 04
Time 11 AM/PM

☐ Originator Placed Call
☐ Originator Received Call
W.O. No. 20103.001.001.1078.00
20103.001.001.1128.00

Subject Storm Sewers along Cornelia Ave, Newark, NJ

Notes:

MC was informed that the sanitary and storm sewers are two seperate systems in this area (Cornelia & Albert Ave, Newark, NJ).

The sanitary sewers go toward the Passaic Valley Sewage Commission processing plant.

The storm sewers are directed under Lister Ave and empty into the Passaic River.

☐ **File**
☐ **Tickle File** / /
☐ **Follow-Up By:**
☐ **Copy/Route To:**

Follow-Up-Action: The 15-mile Surface Water pathway will begin north of the sites in the Passaic R.

Originator's Initials MC

RFW 110-4-83

1423-1823 4/16/93

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Reference 15

LUTHER H. HODGES, Secretary

F. W. REICHELDERFER, Chief

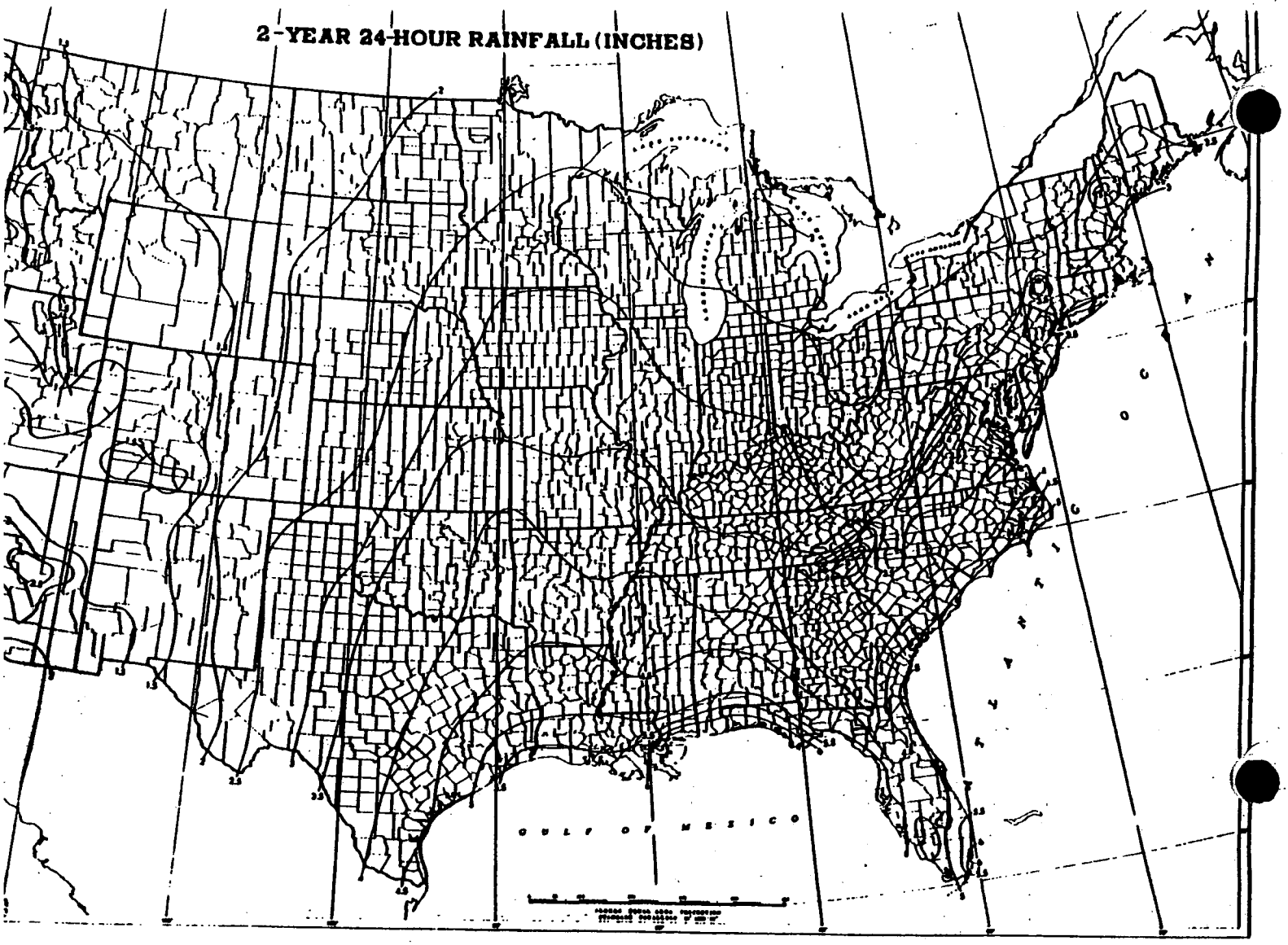
TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture

(1)



[redacted]

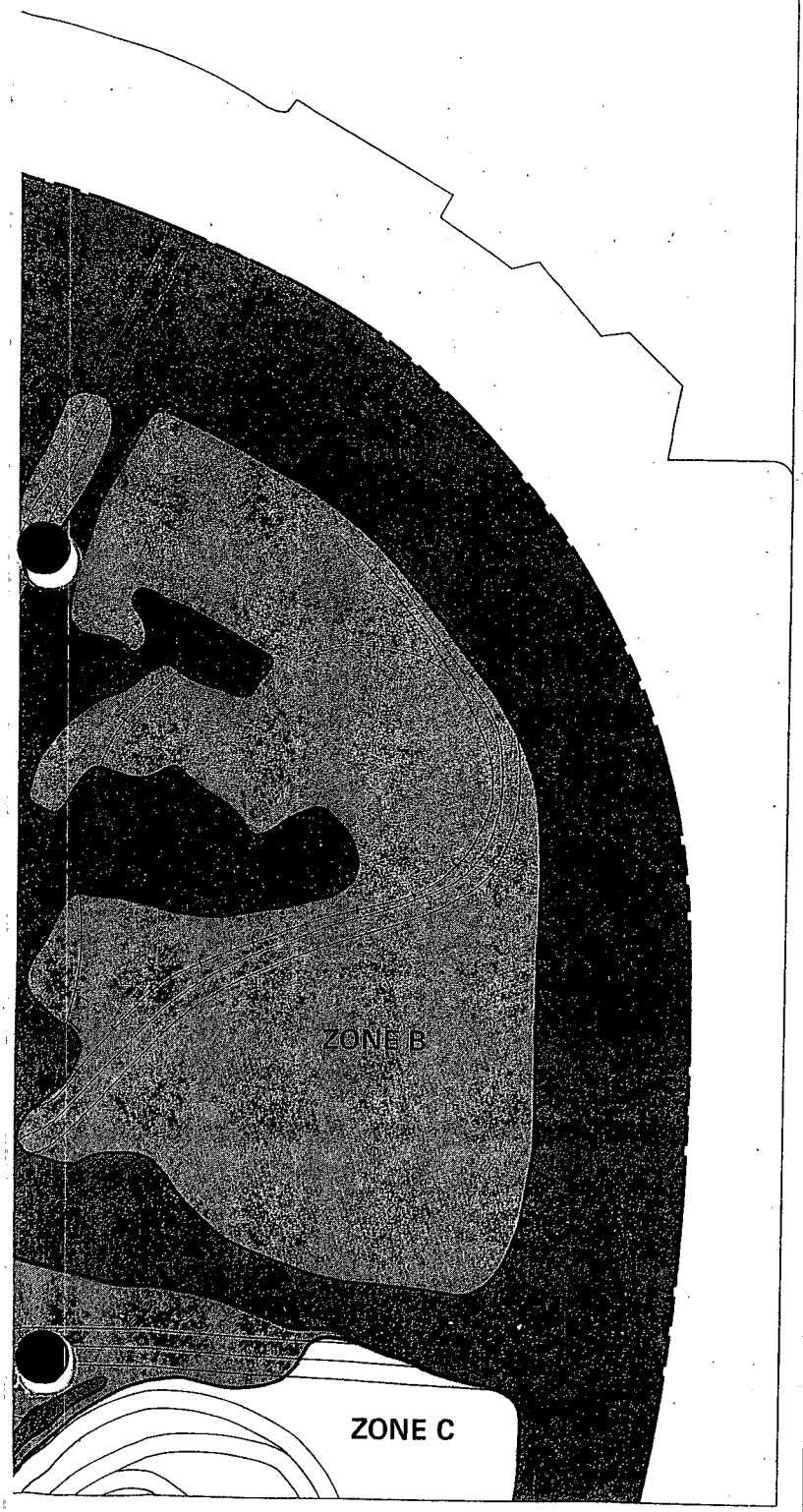
Reference 16

structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620, or (800) 424-8872.

APPROXIMATE SCALE

400 0 400 FEET



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

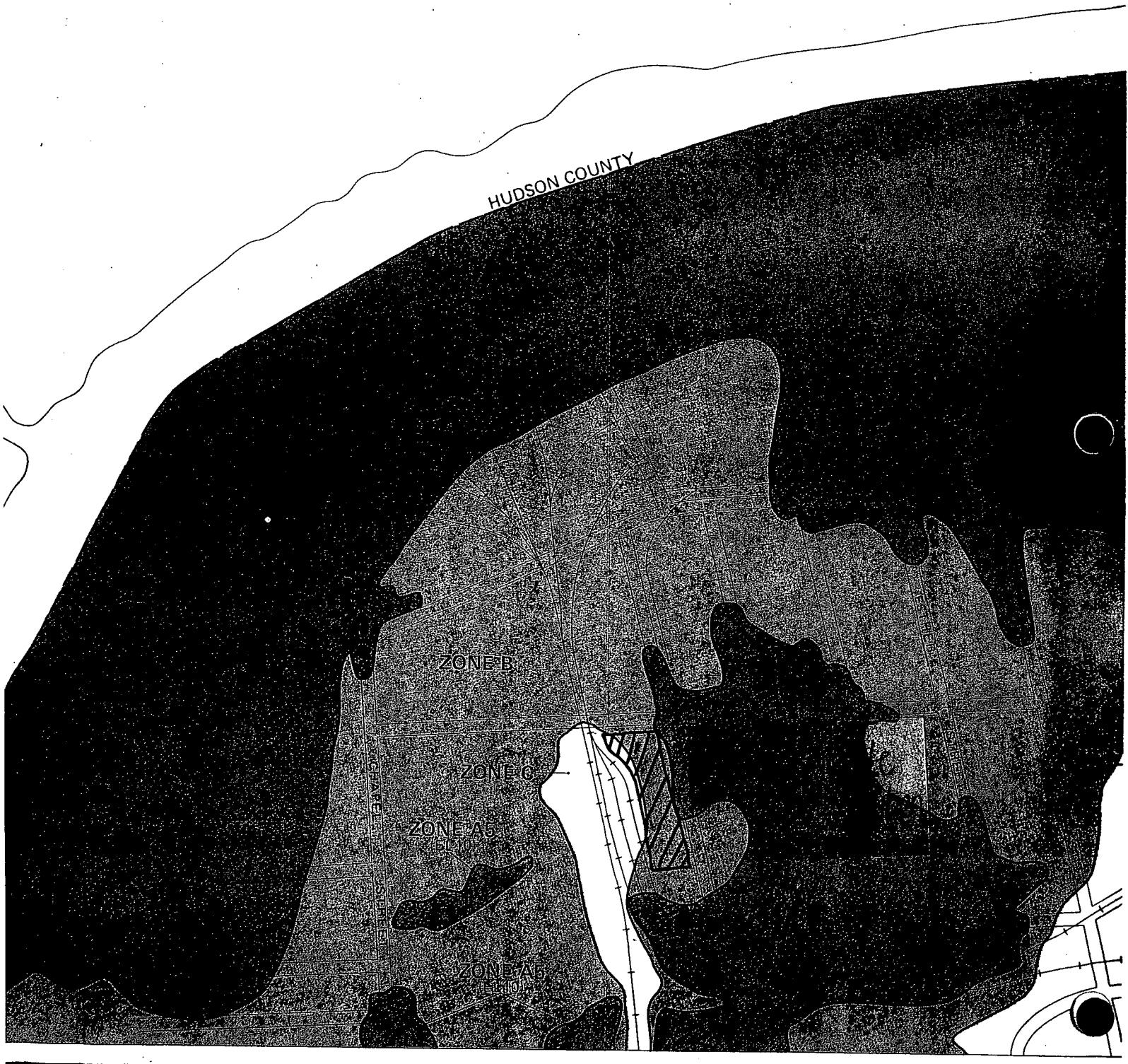
CITY OF
NEWARK, NEW JERSEY
ESSEX COUNTY

PANEL 5 OF 12
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
340189 0005 B

EFFECTIVE DATE:
MARCH 28, 1980

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

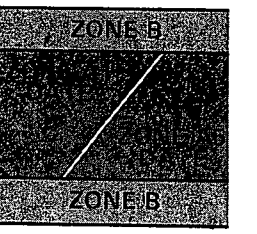

HUDSON COUNTY
ZONE B
ZONE C
ZONE A5
EL 10
ZONE A5
EL 10

KEY TO MAP

500-Year Flood Boundary

100-Year Flood Boundary

Zone Designations* With Date of Identification e.g., 12/2/74



100-Year Flood Boundary

500-Year Flood Boundary

Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)

Elevation Reference Mark — RM7 ×

River Mile — • M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
MARCH 15, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:

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Reference 17

PROJECT NOTE **REGION II SITE ASSESSMENT TEAM**

To: Cellofilm Corporation File Date: 6 October 2003 **Page:** 1 of 5

W.O. No.: 20103.001.001.1078.00

From: Michele Capriglione, Region II SAT

Subject: Threatened, Endangered, and Fishable species of the Newark Bay Complex

The attached reference was provided to Michele Capriglione of Weston Solutions, Inc. by Peter Himchack of the Marine Fisheries Section of the NJDEP in response to a request for information on threatened, endangered, and fishable species associated with the Newark Bay Complex. The attached lists the threatened and endangered species of the Newark Bay. The reference also lists the fish caught in the Newark Bay for consumption and the fish which are under the consumption advisory.

Signature Michele Capriglione

Michele Capriglione

Wildlife of the Harbor Estuary's Newark Bay Complex

The Newark Bay Complex is a highly industrialized urban area that is also home to numerous species of animals and plants. Several of these are on the state or national threatened or endangered species list. This brochure, which is a companion piece to Wildlife of the Harbor Estuary's Newark Bay Complex poster, is designed to identify and provide some basic information about the species illustrated. The objective of the poster is to create an awareness of the rich natural resources that can be found within the Newark Bay Complex. The poster also seeks to identify species of fish that are under state fish consumption advisories, so that young people and their families can make informed decisions about what species are safe to eat.

In the early 1980s, research conducted by the Division of Science, Research and Technology determined that several species of fish and one type of crab had elevated levels of dioxins and polychlorinated biphenyls (PCBs). This prompted the Commissioners of the New Jersey Department of Environmental Protection (NJDEP) and the New Jersey Department of Health and Senior Services (NJDHSS) to issue advisories to the public on safe consumption practices for recreationally caught fish. The advisories have remained in place since that time.

The Newark Bay Complex includes Newark Bay, Hackensack River downstream of the Oradell Dam, Arthur Kill, Kill Van Kull, tidal portions of all rivers and streams that feed into these waters, and the Passaic River downstream of the Dundee Dam and streams that feed into this section of the river. The species under advisory include: Striped Bass, American Eel, Blue Claw Crab, Bluefish larger than 6 lbs., White Perch and White Catfish.

The advisories for the general population are:

- ✓ DO NOT EAT Striped Bass or Blue Claw Crab;
- ✓ DO NOT EAT MORE THAN ONCE A WEEK, American Eel, Bluefish larger than 6 lbs., White Perch, and White Catfish.
- ✓ For high risk individuals, who include women of childbearing age and children under the age of 15 years, DO NOT EAT ANY OF THESE SPECIES.
- ✓ For the Passaic River, it is advised DO NOT EAT any fish, shellfish or crustaceans from the river downstream of the Dundee Dam, and associated waters.

In addition, there is a ban on the taking or harvesting of blue claw crab from the Newark Bay Complex. Fines ranging from between $100 and $3,000 can be incurred for the first offense.

For background information on the advisories, local libraries can refer you to NJ Administrative Code 7:25-14, 18 A.

For additional information on this brochure or the state fish consumption advisories, contact: NJ Department of Environmental Protection, Division of Science, Research and Technology, 609-984-6070; Division of Fish and Wildlife, 609-748-2020; NJ Department of Health and Senior Services, Consumer & Environmental Health Services, 609-588-3123.

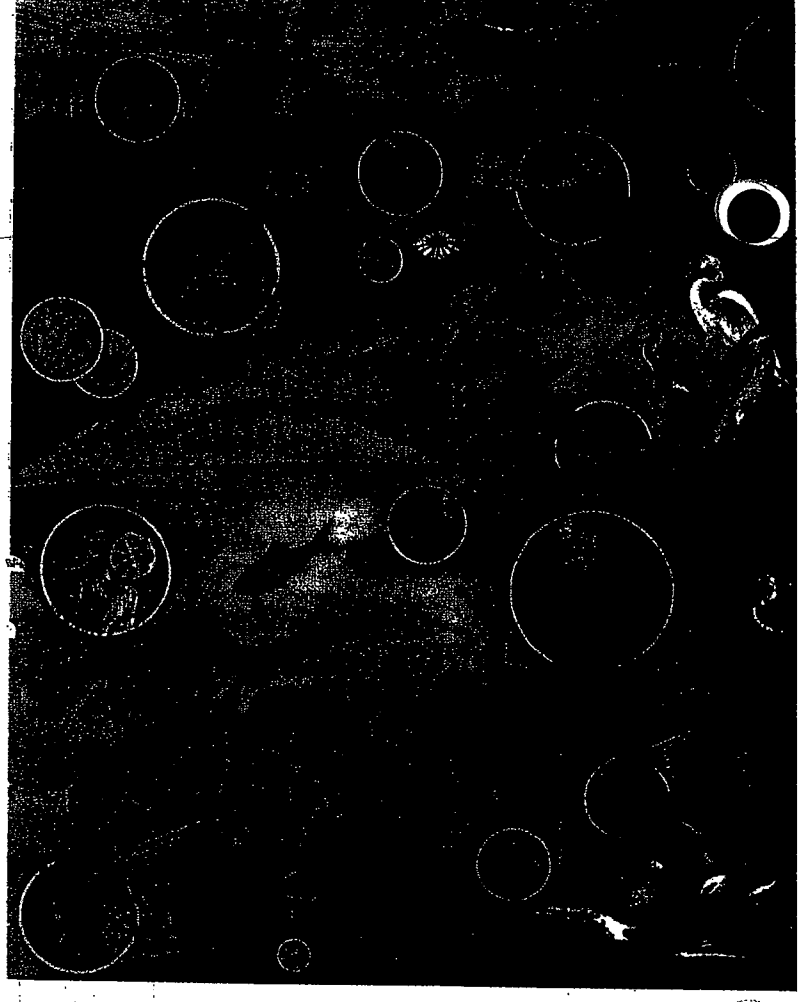
ABOUT THE ARTIST

Raised in Southern New Jersey, Kathy Johnston was never at a loss for nature's beauty or scenery to paint. Salt marshes, old buildings, fishing boats and historical sites were among her favorite subjects. Recreational scuba diving, kayaking, mountain biking and hiking have offered opportunities for inspiration from which Kathy often paints.

Now relocated in Malvern, Pennsylvania, Kathy searches for new students, new scenery and new inspiration to share her enthusiasm for the arts. Artistic affiliations include Young Audiences, Rutgers University, the Atlantic City Ocean Life Center, the Artificial Reef Association, and New Jersey Outdoors Magazine.

This self-taught artist has developed skills that have received many awards and much recognition. Kathy's paintings and prints can be found in New York, Texas, the Virgin Islands, Australia and the East Coast from Maine to the Florida Keys. Her respect for the marine environment and its inhabitants is always apparent in her paintings and lifestyle.

Kathy Johnston
Custom Artwork
472 E. King Street, Unit B
Malvern, Pennsylvania 19355



WILDLIFE of the Harbor Estuary's NEWARK BAY COMPLEX

New Jersey Department of Environmental Protection

Division of Science, Research and Technology

Division of Fish and Wildlife

Harbor Watershed Education/ Urban Fishing Program

NEW JERSEY DIVISION OF FISH & WILDLIFE

The New York-New Jersey Habor Estuary Program

BIRDS of the NEWARK BAY COMPLEX

It is easy to see a heron or egret along the waterways of the Newark Bay Complex. They like the extensive mudflats, marshes, shallow pools, and tidal [illegible] that the waters of the Complex create. **Great Egrets** (36) are the largest [illegible] white long-legged wading birds. Often they are seen walking slowly [illegible]gh shallow water, ready to stab at prey with their large yellow bills. The smaller **Snowy Egret** (37) eats fish and amphibians. If seen out of the water it is recognized by its yellow feet or "golden slippers". **Great Blue Herons** (38) are the largest of the wading birds, looking almost gray from a distance. The Great Blue Heron, once listed as a threatened species in New Jersey, which means they may become endangered if conditions in the State, such as habitat, disease, or contamination, are not improved, has been removed from the list. This is wonderful news for New Jersey and of course for the Great Blue Heron.

Not easily seen is the medium-sized **Black-Crowned Night Heron** (39). It rests during the day by hiding in the cattails and reeds, but at dusk it becomes active. Like other wading birds, it will walk slowly along the banks of the marshes, patiently waiting to strike out at fish, crabs and other aquatic creatures to eat. Unfortunately, unlike the Great Blue Heron, the Black-Crowned Night Heron is included on the New Jersey threatened species list.

It is difficult to visit the Newark Bay Complex without crossing paths with a gull. Termed "seagulls", there are numerous gulls that visit the Complex during migration and the winter months. The largest of these is the **Great Black-Backed Gull** (40), easily recognized by its black wings that contrast with a striking white head. Also common is the **Herring Gull** (41), slightly smaller than the Great Black-Backed Gull with gray wings and a red dot on its yellow bill. Smaller yet is the **Ring-Billed Gull** (42), aptly named for the black ring around its bill. All these birds are opportunistic feeders; they will scavenge along the water's edge, find food in refuse piles and even steal food from other birds.

Similar to a gull to the casual observer, but vastly different in habit, is the **Common Tern** (43). This buoyant flier can be seen hovering above the water's [illegible], eyeing the fish below. When it feels that it can grab a good meal, the [illegible]ll dive straight down, headfirst into the water. This differs drastically from the feeding strategy of the **Black Skimmer** (44), who actually flies just above the water's surface and dips its bill into the water as it flies. As soon as the Skimmer's bill encounters a fish, the bill snaps shut with its prey. The Black Skimmer is listed as an Endangered Species in New Jersey, which means prospects of survival in the state are in immediate danger and assistance is needed to prevent extinction.

Floating on the surface of the water could be a **Mallard** (45). Travelling in pairs, these common dabbling ducks feed on aquatic vegetation and can be seen often with their tails in the air as they try to reach plants growing just under the water's surface. Diving nearby one might see the **Double-Crested Cormorant** (46), a duck-like bird with a long neck. They eat fish primarily and will dive under the surface and swim underwater to find food. If you find yourself along the water's edge and watch the Cormorant, you would know who is the most successful angler of the Newark Bay Complex.

The **Osprey** (47), although still listed as threatened, has made an incredible comeback from being on the brink of extinction in New Jersey. This large hawk-like bird with its striking black, brown, and white markings can be seen gliding over large waterways. Ospreys only eat fish and when they drop to the water to catch one, they grab it with their talons. Also increasing in population are **Peregrine Falcons** (48), with several pairs nesting on bridges and buildings in the Newark Bay Complex area. These fast flying, powerful birds primarily feed on other birds such as pigeons, waterfowl and shorebirds. Peregrine Falcons are listed in New Jersey and Federally as Endangered Species.

The marshes are filled with numerous songbirds, the most common being the **Red-Winged Blackbird** (49). Singing from atop a reed stalk, this bird pro[illegible] its territory to others of its species with the loud "kon-ka-ree"!

PLANTS

Horsetail (50), a medium-height perennial herb, can be found in tidal and non-tidal fresh marshes and shallow water of the Newark Bay Complex. Common Horsetail growing to about 1 foot, has hollow green stems and minute dark brown pointed scale-like leaves. **Common Cattail** (51A) and **Narrow-Leafed Cattail** (51B) are home during the day for the Black-Crowned Night Heron. These tall perennial herbs have long flat leaves with flowers in dense cylindrical terminal spikes. Common or Broad-Leaved Cattail grows 5-9 feet high, with simple elogate leaves up to 1" wide. The terminal spike is composed of two parts, the male flower spike above and contiguous with the female spike. Narrow-Leafed Cattail most commonly found in tidal marshes, can be distinguished from its counterpart by the separation between the male and female parts of the flower. Also, as its name implies, the leaves are narrow, getting up to only 1/2" wide. The graceful, delicate leaves of the **Cinnamon Fern** (52) are found in forested wetlands and along stream banks. This fern grows up to 5 feet tall and is often seen with cinnamon colored woolly stalks. The Cinnamon Fern also grows in Canada, Europe, and the tropics.

One predominant plant species found throughout the wetland areas of the Newark Bay Complex is what is commonly called Spartina. Often thought of as one plant, many varieties of this hollow stemmed plant exist. The poster contains three types: **Salt Meadow Grass, Salt Marsh Grass, and Salt Reed Grass. Salt Meadow Grass** (53A), also called Salt Hay, is low to medium height (1'-3' tall) and is found in irregularly flooded salt and brackish marshes; **Salt Marsh Grass** (53B) is usually the only Spartina in the regularly flooded low marsh zone of salt and brackish marshes. Salt Marsh or Saltwater Cordgrass grows 1 to 8 feet tall. **Salt Reed Grass** (53C) can be found in irregularly flooded salt, brackish, and tidal fresh marshes. Also known as Big Cordgrass, Salt Reed stands 3 1/2 to 10 feet tall, and has an open terminal inflorescence composed of 20-50 crowded spikes.

The moderate to fast growing **Pin Oak** (54) can be found bordering swamps. This broad-leaved deciduous tree has a growth pattern unlike most oaks, a continuous central trunk with scaly, ridged bark and slender, short lateral branches. The dark gray to brown Pin Oak, with light brown acorns, can be found up to 110 feet tall. **Scotch Pine** (55), often used as Christmas trees, is the most widely distributed pine in the world. The Scotch Pine with its oblong cones, and dark bluish green leaves, not native to New Jersey, has been naturalized in parts of New England, Sandy Hook, the Pinelands, and can be found along the rivers of the Newark Bay Complex.

The birds are not the only ones that contribute to the amazing colors of the Newark Bay Complex, in the spring through fall all sorts of flowering plants dot the landscape. **Asiatic Dayflower** (56), sometimes called Spiderwort, can be found in many varieties of colors. These colorful flowers unfortunately last a short time, as their name suggests. Between August and October, the graceful clusters of the deep yellow flowers mixed together with the green foliage of **Seaside Goldenrod** (57) seem to go on forever. This perennial, 3 to 4 feet in height, is found in irregularly flooded salt, brackish, and tidal marshes of the Newark Bay Complex, in addition to sand dunes and beaches. One of the most striking flowers, is the short-lived **Sunflower** (58). This burst of yellow energy is an important source of vegetable oils for humans. Blooming from July through frost is the **Black-Eyed Susan** (59). The dark brown disk surrounded by deep golden yellow rays seems to light up the landscape. **Ox-Eye Daisy** (60), with the appearance of what would be considered the common daisy, can be found cheering up the Newark Bay Complex. Growing along non-tidal and brackish marshes is the **Swamp Rose Mallow** (61), with its huge saucer-shaped blooms. This beautiful perennial can grow as tall as 7 feet. The flower, which is 4-6 1/2", has white or rose colored petals with deep purple or red centers.

AQUATIC SPECIES

If you encounter anglers in the Newark Bay Complex, chances are they are trying to catch **Striped Bass** (1). Striped Bass commonly reach 30 lbs., but can be 50, 60, or even 70 lbs or more. They are found schooling in many of the State's rivers, bays, and estuaries. One of the most sought after recreational fish, **Bluefish** (2A) spawn off the coast June-August. New Jersey estuaries are important nursery grounds for Bluefish juveniles, known as **Snappers** (2B), which average less than 10". Maturity is reached in 2 years at about 14". These voracious fish prey heavily on other fish on their migration run. **White Catfish** (3) have feelers extending from each side of its jaws, giving them whisker-like features. If you want to catch a catfish you had better have enough line because they are bottom dwellers. **White Perch** (4) another sought after fish, spawns in the spring, when the female deposits a long string of eggs in shallow waters of the estuary.

Undoubtedly, one of the most popular catches, not only in the Newark Bay Complex, but all of New Jersey, is **Blue Claw Crab** (5), which is olive on top, with a deep blue stripe down the middle of its claws. Although they can swim to catch prey, they are generally bottom feeders. They prefer sandy bottoms where they hide from predators and burrow to overwinter. Blue Crabs reach maturity in 12-18 months, however the majority does not live beyond 2 years. The crab can get up to 9" wide, always half as long as it is wide. The most unusual species on the poster may be the **American Eel** (6), which swims against the tide, to turn a phrase; it lives in fresh water, but returns to the open ocean to spawn. Migration and reproduction of eels remained a mystery until the 20th century when their spawning grounds were discovered in the Sargasso Sea (between Bermuda & Puerto Rico). Species 1-6 may all appear different, however they all have something very important in common, they are listed in the State Fish Consumption Advisories. The Blue Claw Crab and American Eel caught in the Newark Bay Complex should not be eaten and caution should be used when consuming the others. See back cover for the specific State guidelines.

Atlantic Menhaden (7), aka Bunker or Mossbunker, travel in large schools along the coast. The fish, which is rich in oil, is caught in large quantities and is used for bait and animal feed. In 1997, refined Menhaden fish oil was FDA approved for general use in foods for human consumption. **Atlantic Herring** (8) swim near the water's surface in huge schools, feeding on Plankton. Similar to trees, scientists can determine the age of a Herring by counting rings on their scales. **Summer Flounder** (9A) and **Winter Flounder** (9B) are flat fish. Both look similar and are found in brackish water, however, there is one sure way to tell them apart; its in the eyes. Summer Flounder, also called Fluke, have both eyes on the left side of their body. Winter Flounder, the smaller of the two fish have both eyes on the right side. **Mummichog** (10) also called Killie, is most commonly used for bait. In fact, one can find Killie traps within the Newark Bay Complex just waiting to fill up with what will soon be dinner for larger fish.

Think fish can't talk, think again; if you catch the bottom dwelling **Striped Searobin** (11) don't be surprised to hear it grunt, a sound produced by its swim bladder. While it may not win a Grammy (or a beauty contest for that matter) the **Oyster Toadfish** (12) also produces a croaking noise. This large headed fish can live out of the water for several hours! It is also called Oyster Cracker because of its huge, strong mouth. **Carp** (13) is the first species of freshwater fish found in the upper rivers of the Newark Bay Complex. They prefer shallow, warmer, fresh waters and in winter they stop feeding and stay near the bottom. The **Scup** (14), aka Porgy, is a popular fish. This carnivorous shore fish is thin, twice as long as it is deep. **Bluegill** (15) another freshwater fish, is also commonly known as a Sunfish. During spawning, the male Bluegill will build a shallow nest and guard the eggs until they hatch. The **Atlantic Silverside** (16) another important bait fish, is usually found in salt marshes and estuaries, in less than 10 feet of water. These schooling fish are an important link in the food chain of the Newark Bay Complex ecosystem, eating almost anything smaller than themselves and feeding larger fish of both commercial and recreational importance. You will find the mesmerizing **Lion's Mane Jellyfish** (17A) in the southern most sections of the Newark Bay Complex moving by means of a slow motion jet propulsion. The graceful dance of the Red Jellyfish can rival the most prima ballerina. Along with the Lion's Mane is the **Moon Jellyfish** (17B) and the **Comb Jelly** (17C). Both are clear and in fact are not true jellyfish, they do not sting and are pushed primarily by currents.

Algae (18A & B), simple plant-like organisms, are the foundation of most aquatic food webs. One of the most important photosynthesizing organisms on earth, algae capture more sun's energy and produce more oxygen than all plants combined. **Green Algae** or Spirogyra (18A) are microscopic algae. In contrast, **Ulva** (18B) considered seaweed, is the largest algae. Ulva, a translucent bright green, can grow up to 3 feet long. It provides food and shelter for marine animals. **Plankton** (19) which can also be part of the Algae family, are the smallest members of the poster. Phytoplankton and Zooplankton, microscopic plants and animals, respectively, are dinner for some of the smaller inhabitants of the Newark Bay Complex.

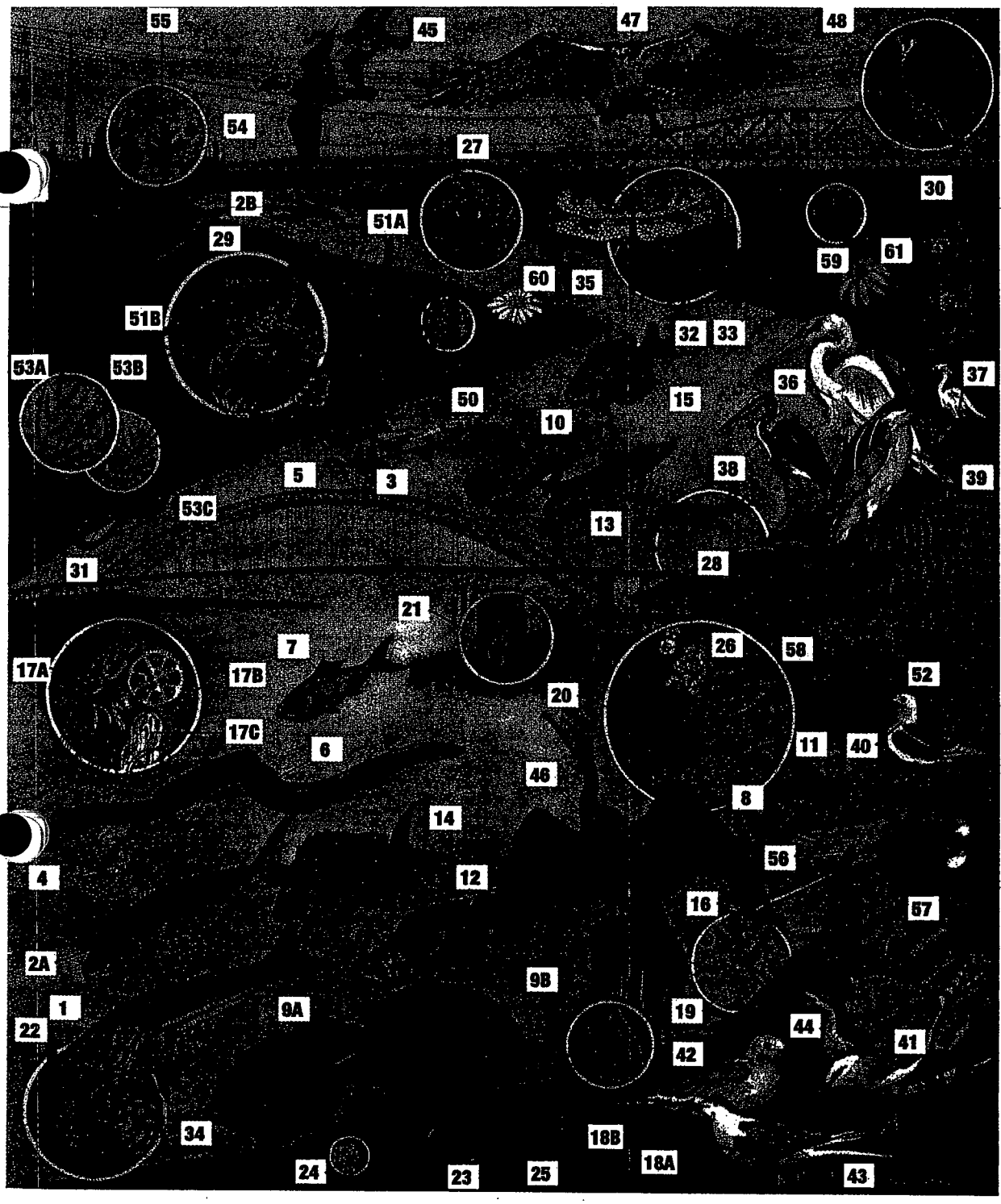
BIVALVE/CRUSTACEAN/TERRESTRIAL

The **Blue Mussel** (20), violet-blue with shiny blue-black outer covering, bring color to the often dark and dreary pilings found along the waterways of the Newark Bay Complex. This common sea mussel found attached to rocks on the shores of America and Europe, is widely used as food and bait. The **Ribbed Mussel** (21) identified by its ridges, can be found growing in clumps [illegible] marshes of the Newark Bay Complex. **Soft-Shell Clam** (22), aka Ste[illegible] generally found in muddy sand. When disturbed it ejects a spurt of wa[illegible] withdraws to safer depths by means of a hatchet-shaped muscular foot. The wavy, irregular shaped **Slipper Shell** (23) and **Bryozoan** (24) also called "moss animals" [aquatic organizims living in colonies of interconnected individuals] are often found attached to the **Horseshoe Crab** (25). The Horseshoe Crab, more closely related to spiders than crabs, has remained literally unchanged for more than 300 million years. In late spring females lay eggs on sandy beaches of bays and estuaries. The numbers of this timid creature are threatened because of its value as bait in conch and eel traps. Perhaps the fact that serum from the live horseshoe crab is the world's only known source of a compound used to test for purity in drugs and vaccines and intravenous drips in every hospital, can help save one of the oldest living creatures on our planet.

At first glance, the **Barnacle** (26) resemble mollusks, but they are actually crustaceans. Their planktonic larvae are free swimming, but as adults are always attached to objects (rocks, piling, ship bottoms) living in a tiny igloo-like structure, kicking food into its mouth with its feet. Hundreds of **Fiddler Crabs** (27) can be found on mud flats in the Meadowlands during low tide. They eat algae and other organic matter. The male Fiddler Crab has one large front claw, so large it is up to half its body weight. The claw is used to court females and define territory. If the male loses this claw, the smaller claw enlarges and a new small claw regenerates in place of the lost claw.

Grass Shrimp (28) can get only as large as 2". This nearly transparent to brown colored shrimp may be inedible for humans, but is a feast for many inhabitants of the Newark Bay Complex. Take a canoe ride through the Meadowlands at low tide and you will almost certainly see the **Northern Diamondback Terrapin** (29), the only estuarine turtle, sunning itself on a mudflat. The Northern Diamondback is in peril because bulkheading and coastal development destroy nesting sites, and cars run them over when they come [illegible] causeways to lay eggs. The sex of the hatchlings is determined by t[illegible] ture at which the eggs are incubated. Those nearer the surface, expe[illegible]ng greater warmth are more likely to become female. **Eastern Garter Snake** (30) can grow to about one meter. This slender snake lives close to water, feeding on amphibians, insects, small mammals, and birds. The Garter Snake can vary in its appearance, but is usually olive, grey, or brown. The **Northern Water Snake** (31) is about the same size as the Garter and can be almost any color from light grey to dark brown. This heavy-bodied snake can be found in swamps and marshes feeding on fish and amphibians.

You can find (and hear) the largest frog in the United States in the Meadowlands, the **Bullfrog** (32), which has a distinct deep throated call of "Jug-a-rump". This carnivorous amphibian's hind legs, which are longer than their bodies, are considered a delicacy. If you look closely along the banks of the Meadowlands you can see the **Muskrat** (33). This semi-aquatic rodent has a long tail, which it uses as a rudder when swimming. The Muskrat eats water plants, invertebrates, and sometimes fish. The **Sandy Mud Worm** (34) are found burrowing in tidal flats and are an important forage base for many fish and wading birds. The largest known **Dragonfly** (35), with a wingspan of 29" lived over 270 million years ago. While you are unlikely to see one quite that large in the Newark Bay Complex, these interesting insects, known for territorial behavior, can be observed munching on mosquitoes and other small flying insects.



AQUATIC SPECIES

1. **Striped Bass *(Morone saxatilis)* Moronidae M, NB**
2A. **Bluefish *(Pomatomus saltatrix)* Pomatomidae NB**
2B. Snappers 'Snapper Blues, Young Bluefish' M
3. **White Catfish *(Ameiurus catus)* Ictaluridae M, NB**
4. **White Perch *(Morone americana)* Moronidae M, NB**
5. **Blue Claw Crab *(Callinectes sapidus)* Portunidae M, NB**
6. **American Eel *(Anguilla rostrata)* Anguillidae M, NB**
7. Atlantic Menhaden 'Mossbunker, Bunker' *(Brevoortia tyrannus)* Clupeidae NB
8. Atlantic Herring *(Clupea harengus)* Clupeidae M, NB
9A. Summer Flounder 'Fluke' *(Paralichthys dentatus)* Paralichthyidae NB
9B. Winter Flounder *(Pleuronectes americanus)* Pleuronectidae NB
10. Mummichog 'Common Killie' *(Fundulus heteroclitus)* Cyprinodontidae M, NB
11. Striped Searobin *(Prionotus evolans)* Triglidae NB
12. Oyster Toadfish 'Oyster Cracker' *(Opsanus tau)* Batrachoididae NB
13. Carp *(Cyprinus carpio)* Cyprinidae M
14. Scup 'Porgy' *(Stenotomus chrysops)* Sparidae NB
15. Bluegill 'Sunfish' *(Lepomis macrochirus)* Centrarchidae M
16. Atlantic Silverside *(Menidia menidia)* Atherinidae M, NB
17A. Lion's Mane 'Red Jellyfish' *(Cyanea capillata)* Cyanidae NB
17B. Moon Jellyfish
17C. Comb Jelly Ctenophora
18A. Green Algae, Spirogyra Chlorophyta
18B. Sea Lettuce *(Ulva lactuca)* Ulvaceae
19. Plankton Phytoplankton & Zooplankton

Bold Letter = Under Fish Consumption Advisory
M = Can be found in the Meadowlands
NB = Can be found in the Newark Bay

BIVALVE/CRUSTACEAN/ TERRESTRIAL

20. Blue Mussel *(Mytilus edulis)* Mytilidae NB
21. Ribbed Mussel *(Geukensia demissa)* Mytilidae M, NB
22. Soft-Shell Clam *(Mya arenaria)* Myacidae NB
23. Slipper Shell *(Crepidula fornicata)* Calyptraea
24. Bryozoa
25. Horseshoe Crab *(Limulus polyphemus)* Limulidae NB
26. Barnacles *(Balanus sp.)* Balanidae M, NB
27. Fiddler Crab *(Uca pugnax)* Crustacea M, NB
28. Grass Shrimp *(Palaemonetes pugio)* Palaemonidae M, NB
29. Northern Diamondback Terrapin *(Malaclemys t. terrapin)* Emydidae M
Eastern Garter Snake *(Thamnophis sirtalis)* Colubridae M
Northern Water Snake *(Natrix sipedon)* Colubridae M
Bull Frog *(Rana catesbeiana)* Ranidae M
33. Muskrat *(Ondatra zibethica)* Cricetidae M
34. Sandy-Mud Worm *(Streblospio benedicti)* Polychaeta M, NB
35. Dragonfly *(Libellula sp.)* Insecta M, NB

BIRDS of the NEWARK BAY COMPLEX

36. Great Egret *(Casmerodius albus)* Ardeidae
37. Snowy Egret *(Egretta thula)* Ardeidae
38. Great Blue Heron *(Ardea herodias)* Ardeidae
39. *Black-Crowned Night Heron *(Nycticorax nycticorax)* Ardeidae
40. Great Black-Backed Gull *(Larus marinus)* Laridae
41. Herring Gull *(Larus argentatus)* Laridae
42. Ring-Billed Gull *(Larus delawarensis)* Laridae
43. Common Tern *(Sterna hirundo)* Laridae
44. **Black Skimmer *(Rynchops niger)* Rynchopidae
45. Mallard *(Anus platyrynchos)* Anatidae
46. Double Crested Cormorant *(Phalacrocorax auritus)* Phalacrocoracidae
47. *Osprey *(Pandion haliaetus)* Pandionidae
48. ***Peregrine Falcon *(Falco peregrinus)* Falconidae
49. Red-Winged Blackbird *(Agelaius phoeniceus)* Icteridae

* Threatened Species, NJ
** Endangered Species, NJ
*** Endangered Species, NJ & Federal

PLANTS of the NEWARK BAY COMPLEX

50. Horsetail, common *(Equisetum arvense)* Equisetaceae
51A. Broad-Leaved Cattail *(Typha latifolia)*
51B. Narrow-Leafed Cattail *(Typha augustifolia)* Typhaceae
52. Cinnamon Fern *(Osmunda cinnamomea)* Osmundaceae
53A. Salt Meadow-Grass 'Salt Hay' *(Spartina patens)*
53B. Salt Marsh-Grass 'Saltwater CordGrass' *(Spartina alterniflora)*
53C. Salt Reed-Grass 'Big Cordgrass' *(Spartina cynosuroides)* Gramineae
54. Pin Oak *(Quercus palustris)* Fagaceae
55. Scotch Pine *(Pinus sylvestris)* Pinaceae
56. Asiatic Dayflower 'Spiderwort' *(Commelina communis)* Commelinaceae
57. Seaside Goldenrod *(Solidago sempervirens)* Asteraceae
58. Sunflower *(Helianthus annuus)* Asteraceae
59. Black-Eyed Susan *(Rudbeckia hirta)* Asteraceae
60. Ox-Eye Daisy *(Chrysanthemum leucanthemum)* Asteraceae
61. Swamp Rose Mallow *(Hibiscus palustris)* Malvaceae

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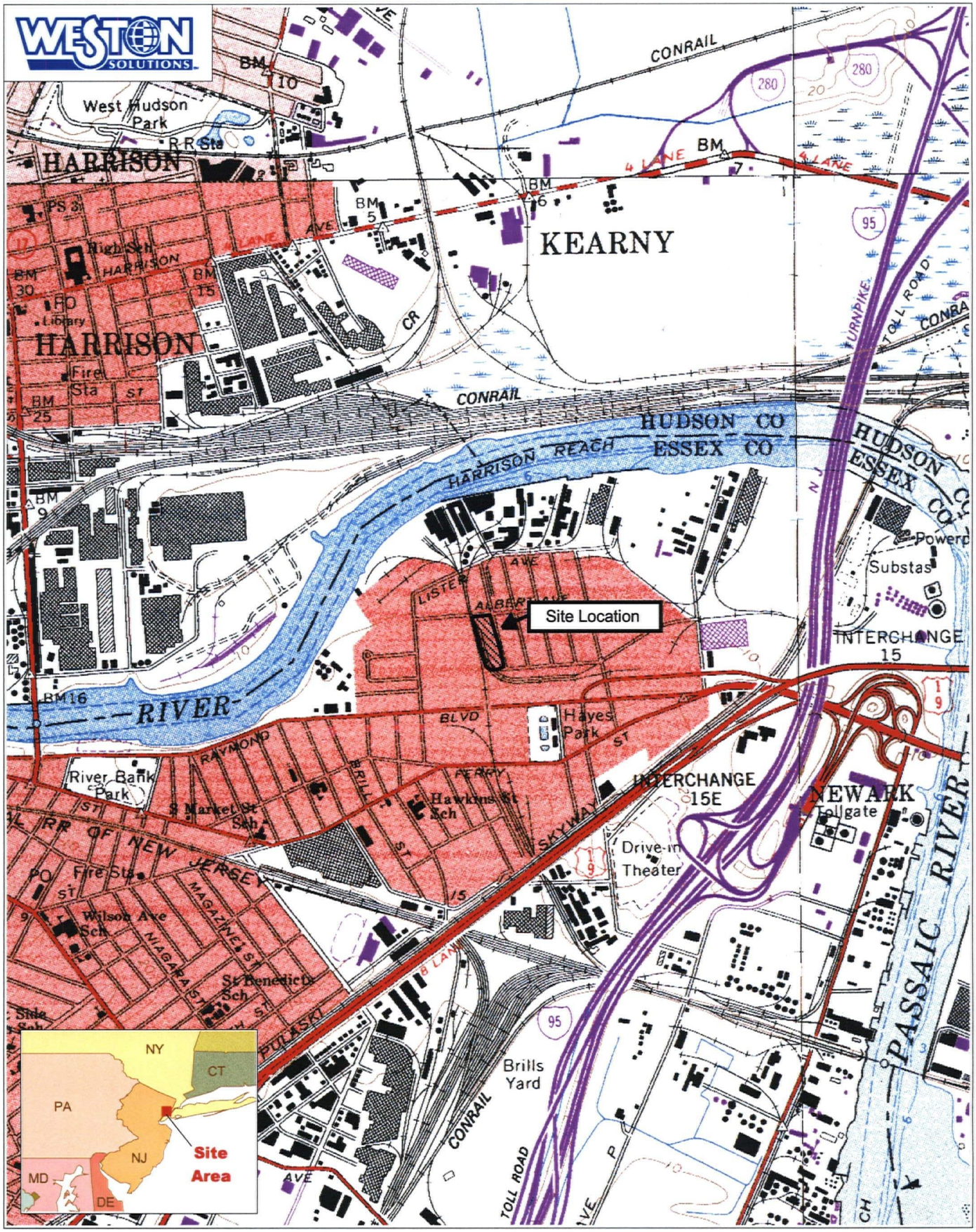
Reference 18



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles: Elizabeth, NJ-NY, 1967, photorevised 1981.

DATE: 9/5/03

Scale in Feet

0 500 1000

N W E S

Figure 1
Site Location Map
Cellofilm Corporation
Newark, Essex County, NJ

Reference 19

WESTON SOLUTIONS, INC.
PROJECT NOTE

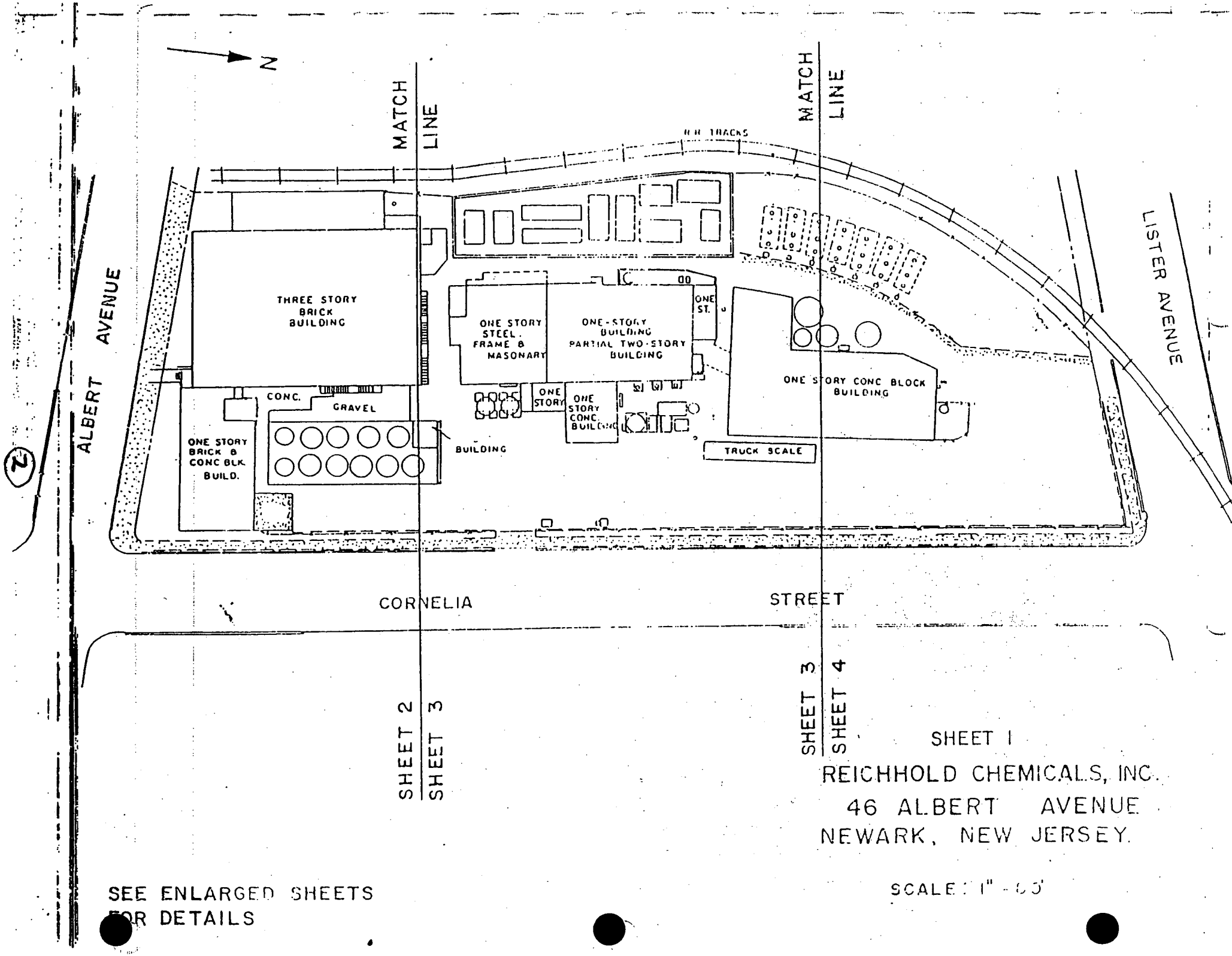
TO: Cellofilm Corporation Site. File (W.A. No.: 078)
FROM: Dennis J. Foerter, CHMM
DATE: 24 January 2005

SUBJECT: ISRA Investigation at Former Reichhold Chemical facility (46 Albert Avenue)

A review of the site investigation report (conducted under the Industrial Site Recovery Act [ISRA]) for the former Reichhold Chemical facility was reviewed to determine if the Cellofilm Corporation property is included in the investigation. This review indicates that the ISRA investigation is focused on the property located at 46 Albert Avenue; the property formerly occupied by Cellofilm Corporation (i.e., 45-5 Cornelia Street) is not included in this investigation (see attached site map).

In an effort to determine the approximate depth to groundwater at the Cellofilm Corporation site, the depth to groundwater from a soil boring advanced on the former Reichhold Chemical property was evaluated. A review of this log indicates that the approximate depth to groundwater is 4 feet below ground surface. A copy of the boring log is attached

Signature/Date: Dennis J. Foerter 1/24/05


N
MATCH LINE
MATCH LINE
R.R. TRACKS
THREE STORY BRICK BUILDING
ONE STORY STEEL FRAME & MASONARY
ONE-STORY BUILDING PARTIAL TWO-STORY BUILDING
ONE ST.
ONE STORY CONC BLOCK BUILDING
CONC.
GRAVEL
ONE STORY BRICK & CONC BLK. BUILD.
BUILDING
ONE STORY
ONE STORY CONC. BUILDING
TRUCK SCALE
ALBERT AVENUE
LISTER AVENUE
CORNELIA STREET
SHEET 2
SHEET 3
SHEET 3
SHEET 4
SHEET 1
REICHHOLD CHEMICALS, INC.
46 ALBERT AVENUE
NEWARK, NEW JERSEY
SCALE: 1" - 60'
SEE ENLARGED SHEETS FOR DETAILS

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING NO: R-1 PAGE 1 OF 1
CLIENT: Reichhold Chemicals, Inc. PROJECT LOCATION: Albert Ave. Newark, NJ FILE NO.: 3208.093.110	SAMPLER: 2" split barrel HAMMER: Direct Push Technology	LOCATION: START DATE: 10/15/97 END DATE: 10/15/97
BORING COMPANY: Environmental Probing, Inc. FOREMAN: Shawn O'Neil O'Brien & Gere GEOLOGIST: DED		LEGEND: Grout, Bentonite, 01 Sand, Screen, Riser

DEPTH BELOW GRADE (FEET)	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVER	"N" VALUE	SAMPLE DESCRIPTION	UNIFIED SOIL CLASSIF. SYSTEM	EQUIPMENT INSTALLED	FIELD TESTING ANALYSES	FIELD TESTING OVM (ppm)
0-2		0-2		2/0.9		Brown-black, c. SAND, little gravel, damp.				15
2-4		2-4		2/0.8		Red-brown, sandy, SILT, some gravel, damp.				10
4-6		4-6		2/2		Red with black speckles, c SAND, some c gravel, dry.				40
6-8		6-8		2/1		Red-brown, c SAND, little gravel, damp.			Sample 6-8' PHC VOC AE	560
8-10		8-10		2/2		Red-brown, c SAND, little gravel, damp. Bottom of Boring @ 10 ft. below grade.				500

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Reference 20

Work Order Number: 20103-001-001-1078-00
Contract Number: 68-W-00-121

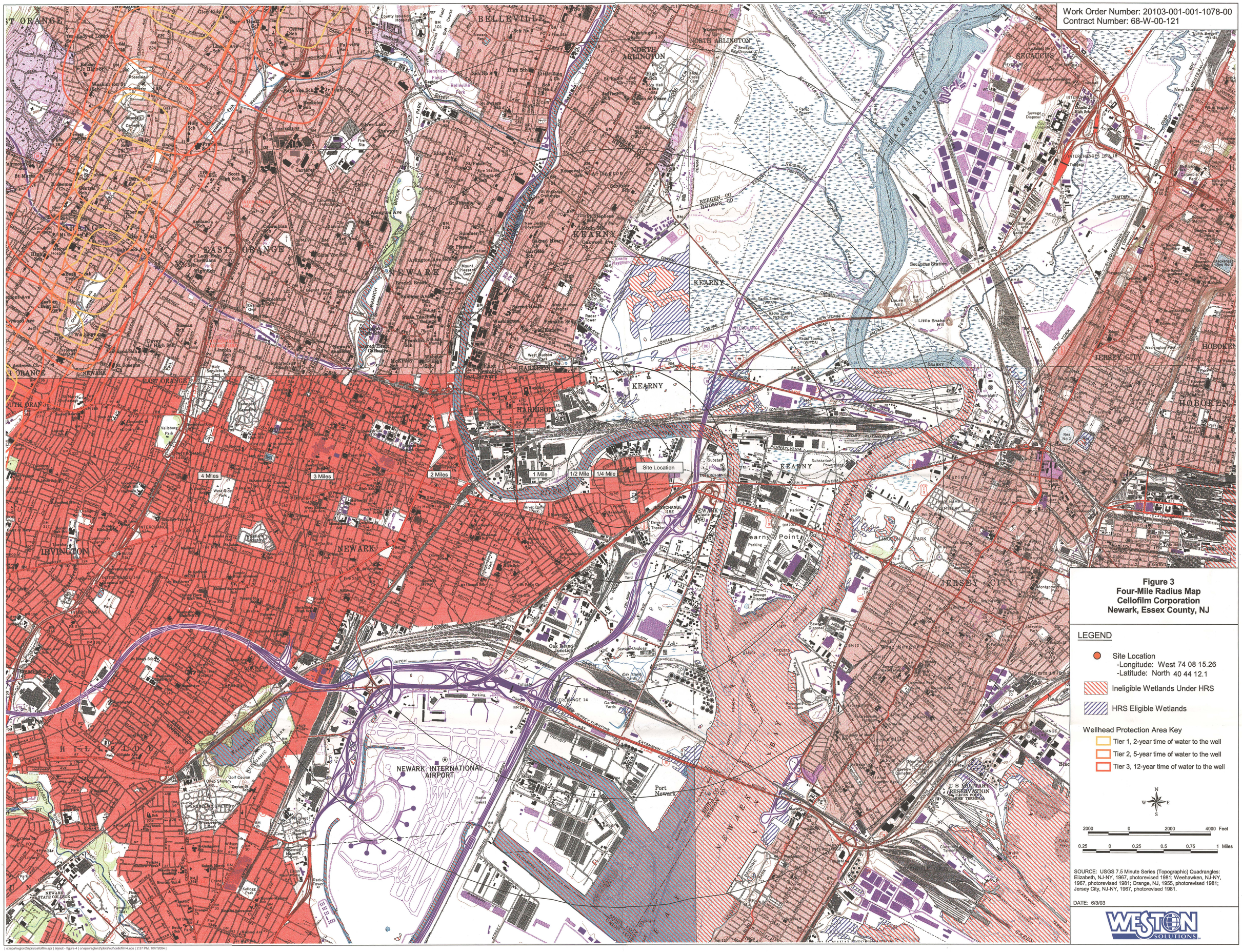

Figure 3
Four-Mile Radius Map
Cellofilm Corporation
Newark, Essex County, NJ

LEGEND

- Site Location
  - -Longitude: West 74 08 15.26
  - -Latitude: North 40 44 12.1
- Ineligible Wetlands Under HRS
- HRS Eligible Wetlands

Wellhead Protection Area Key

- Tier 1, 2-year time of water to the well
- Tier 2, 5-year time of water to the well
- Tier 3, 12-year time of water to the well

N W E S

2000 0 2000 4000 Feet

0.25 0 0.25 0.5 0.75 1 Miles

SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles: Elizabeth, NJ-NY, 1967, photorevised 1981; Weehawken, NJ-NY, 1967, photorevised 1981; Orange, NJ, 1955, photorevised 1981; Jersey City, NJ-NY, 1967, photorevised 1981.

DATE: 6/3/03

WESTON SOLUTIONS

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Reference 21

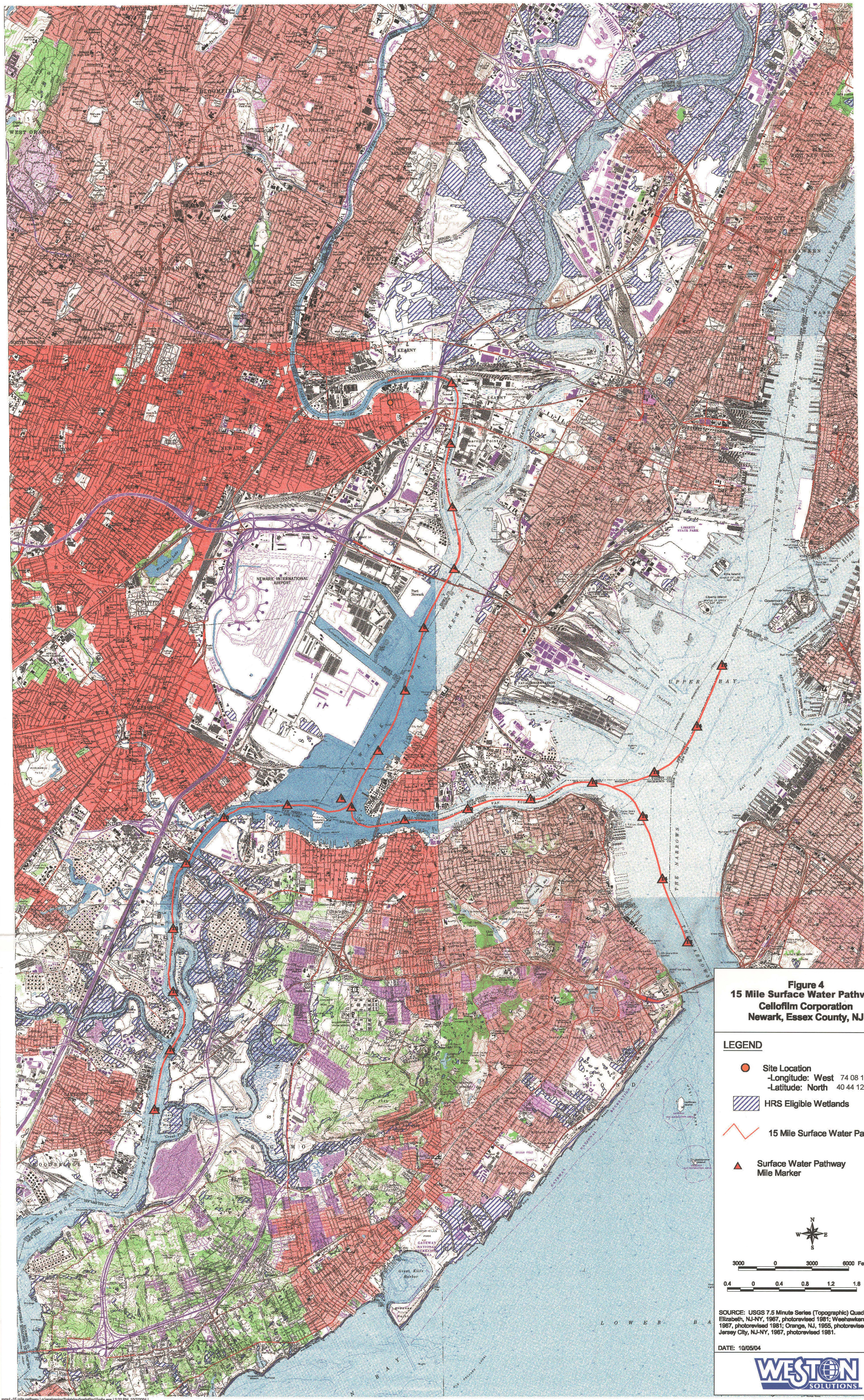


Figure 4
15 Mile Surface Water Pathway Ma
Cellofilm Corporation
Newark, Essex County, NJ

LEGEND

- Site Location
  - -Longitude: West 74 08 15.26
  - -Latitude: North 40 44 12.1
- HRS Eligible Wetlands
- 15 Mile Surface Water Pathway
- Surface Water Pathway Mile Marker

N W E S

3000 0 3000 6000 Feet

0.4 0 0.4 0.8 1.2 1.6 Miles

SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles: Elizabeth, NJ-NY, 1967, photorevised 1981; Weehawken, NJ-NY, 1967, photorevised 1981; Orange, NJ, 1955, photorevised 1981; Jersey City, NJ-NY, 1967, photorevised 1981.

DATE: 10/05/04

WESTON SOLUTIONS

avout -15 mile pathwey | o:\epa\region2\plots\out\cellofilm15mile.eps | 2:22 PM, 10/7/2004 |

Reference 22

WESTON
MANAGERS DESIGNERS/CONSULTANTS

M. Capriglione
Originator

PHONE CONVERSATION RECORD

Conversation with:
Name Ed Apalinski
Company NJ DEP Bureau of
Address Safe Drinking Water
Phone (609) 292-5550
Subject Drinking Water Intakes

Date 1/25/~~04~~ 05 mc
Time 9 AM/PM

☐ Originator Placed Call
☑ Originator Received Call
W.O. No.

Notes:

Ed Apalinski called M. Capriglione in response to the request for any information on intakes located w/in 15-miles downstream of the Cellofilm site.

Ed Apalinski informed M. Capriglione that there are NO DRINKING WATER INTAKES located near the Cellofilm site in Newark, NJ along the Passaic River

There are NO Drinking Water Intakes in the Newark Bay or the Arthur Kill or the Kill Van Kull or the Narrows.

The following map was created by Ed Apalinski for Weston and shows the Drinking water intakes in NJ. There are NONE in the 15-mile downstream SW pathway from Cellofilm

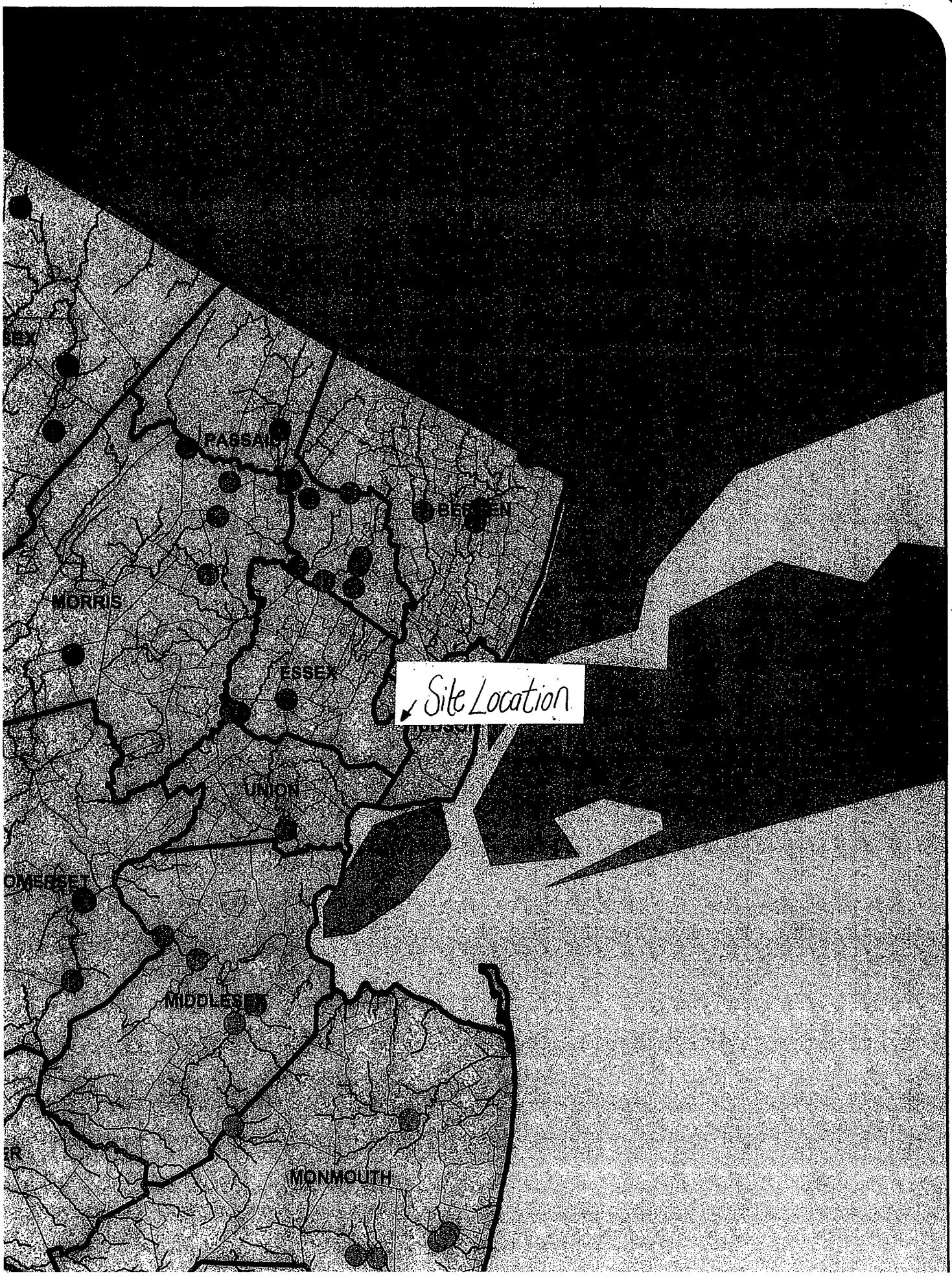
☐ **File**
☐ **Tickle File** / /
☐ **Follow-Up By:**
☐ **Copy/Route To:**

Follow-Up-Action: —

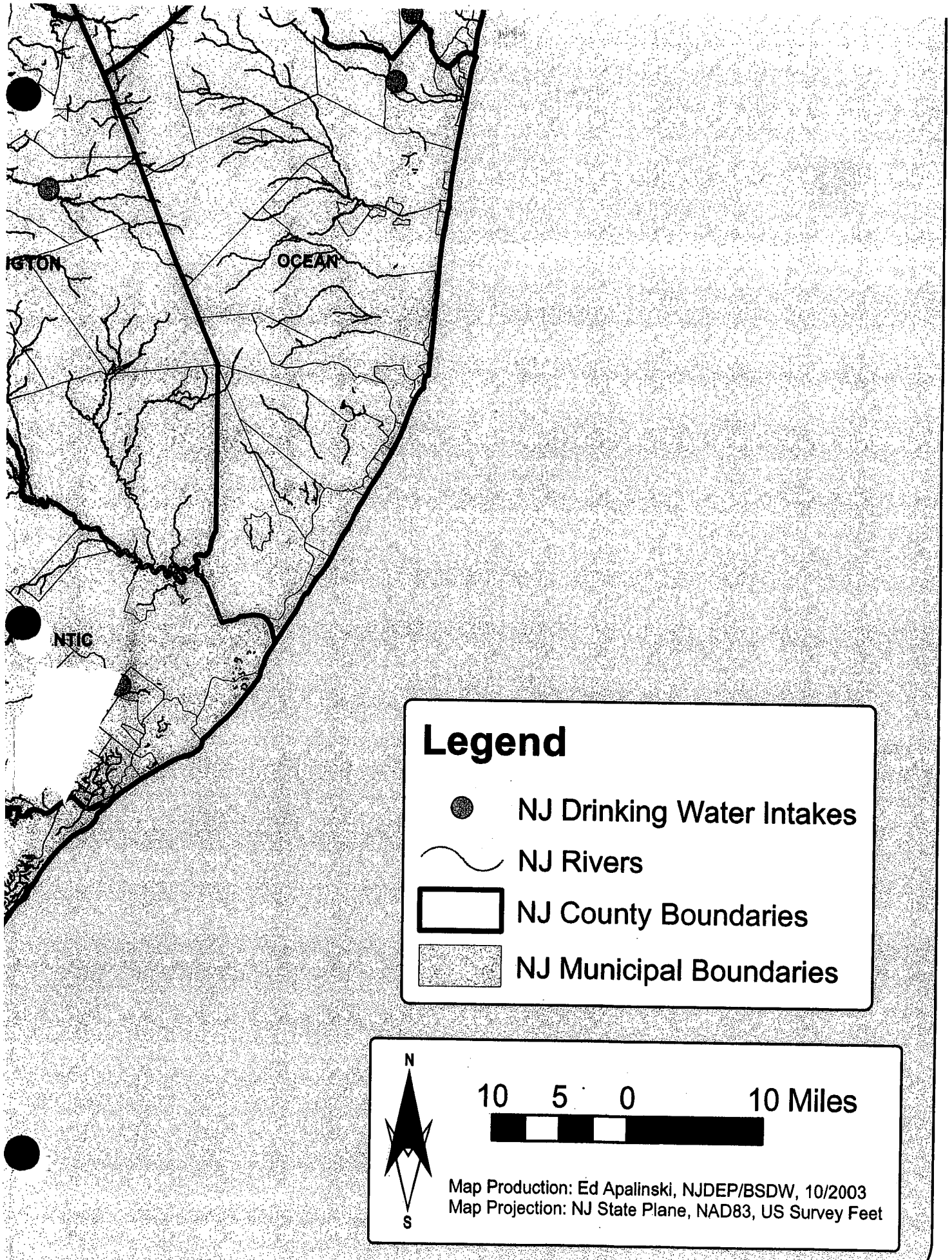
Originator's Initials MC

RFW 110-4-83

1423-1823 4/16/93


PASSAIC
MORRIS
ESSEX
Site Location
UNION
MIDDLESEX
MONMOUTH

2.


IGTON
OCEAN
NTIC
Legend
NJ Drinking Water Intakes
NJ Rivers
NJ County Boundaries
NJ Municipal Boundaries
N
S
10 5 0 10 Miles
Map Production: Ed Apalinski, NJDEP/BSDW, 10/2003
Map Projection: NJ State Plane, NAD83, US Survey Feet

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Reference 23

PROJECT NOTE **REGION II SITE ASSESSMENT TEAM**

To: Cellofilm Corporation File **Date:** 15 September 2004 **Page:** 1 of 2

From: Michele Capriglione, Region II SAT

Subject: Wetlands Within a 4-Mile Radius

The table below documents the amount of HRS-eligible wetland acreage within a 4-mile radius of the Cellofilm Corporation site. Totals are apportioned to distance rings. This table and wetland frontage calculations were prepared by Shannon DiGian, Geographic Information Systems Analyst, Weston Solutions, Inc., who used GIS programs to prepare the 4-Mile Radius Map (Figure 3) and the 15-Mile Surface Water Pathway (Figure 4). These maps, included in this report, indicate the HRS-eligible wetlands within a 4-mile radius of the site and the HRS-eligible wetlands along the 15-mile surface water pathway, respectively.

Distance Ring (mile)	Wetland Acreage
On-Site	0.0
>0 - 1/4	0.0
>1/4 - ½	1.64
>½ - 1.0	11.76
>1.0 - 2.0	473.54
>2.0 - 3.0	901.01
>3.0 - 4.0	1118.81

The total acreage of HRS-eligible wetlands within a 4-mile radius of the site is 2506.76 acres. The total frontage of HRS-eligible wetlands along the 15-mile surface water pathway is 37,858 feet.

Signature M Capriglione

Michele Capriglione

AREAS FOR HRS ELIGIBLE WETLANDS		
	AREA (ACRES)	**AREA (METERS^2)**
total area, ring 4 (3-4)	1118.81	4527681.98
total area, ring 3 (2-3)	901.01	3646264.95
total area, ring 2 (1-2)	473.54	1916352.19
total area, ring 1 (0.5-1)	11.76	47583.13
total area, ring 0.5 (0.25-0.5)	1.64	6620.68
total area, ring 0.25 (0-0.25)	0.00	0.00
	Feet (approximate)	
HRS Eligible Wetlands Frontage	37858	

2

Reference 24

James E. McGreevey
Governor

State of New Jersey

Department of Environmental Protection
Division of Parks and Forestry
Office of Natural Lands Management
Natural Heritage Program
P.O. Box 404
Trenton, NJ 08625-0404
Tel. #609-984-1339
Fax. #609-984-1427

Bradley M. Campbell
Commissioner

October 13, 2004

Michele Capriglione
Weston Solutions, Inc.
205 Campus Drive
Edison, NJ 08837

Re: Cellofilm Corporation

Dear Ms. Capriglione:

Thank you for your data request regarding rare species information for the above referenced project site in Newark City, Essex County.

Searches of the Natural Heritage Database and the Landscape Project (Version 2) are based on a representation of the boundaries of your project site in our Geographic Information System (GIS). We make every effort to accurately transfer your project bounds from the topographic map(s) submitted with the Request for Data into our Geographic Information System. We do not typically verify that your project bounds are accurate, or check them against other sources.

Neither the Natural Heritage Database nor the Landscape Project has records for occurrences of any rare wildlife species on or within 1/4 mile of the referenced site.

We have also checked the Natural Heritage Database for occurrences of rare plant species or natural communities. The Natural Heritage Data Base does not have any records for rare plants or natural communities on or within 1/4 mile of the site.

Attached are lists of rare species records from the Natural Heritage Database and the Landscape Project habitat mapping in the general vicinity of the project site (within approximately four miles) and also records from within approximately 1/4 mile of the associated waterways. Also attached are lists of rare species and natural communities that have been documented from Essex, Hudson, Union and Middlesex Counties. If suitable habitat is present at the project site, these species have potential to be present.

Status and rank codes used in the tables and lists are defined in the attached EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and natural communities. Two of these sites are located within or near the areas you have outlined. Please refer to the enclosed Natural Heritage Priority Site Maps for the locations and boundaries of these sites. On the back of each Priority Site Map is a report describing the significance of the site. You may find the site biodiversity significance rating to be useful if you need to prioritize among the sites in your environmental assessment.

In order to red flag the general locations of occurrences of rare and endangered plant species and natural communities, we have prepared computer generated Natural Heritage Index Maps. Enclosed please find these maps for the Elizabeth, Weehawken, Orange, Jersey City and Arthur Kill USGS quadrangles. If individual projects are to be located in the areas of these maps that contain letter codes, the Natural Heritage Program can be contacted for additional information.

If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend that you visit the interactive I-Map-NJ website at the following URL, http://www.state.nj.us/dep/gis/imapnj/imapnj.htm or contact the Division of Fish and Wildlife, Endangered and Nongame Species Program.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

New Jersey is an Equal Opportunity Employer
Recycled Paper

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Herbert A. Lord

Herbert A. Lord
Data Request Specialist

cc: Robert J. Cartica
Lawrence Niles
NHP File No. 04-4007462

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the database. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEP Land Use Regulation Program, P.O. Box 401, Trenton, NJ 08625-0401.

The Landscape Project was developed by the Division of Fish & Wildlife, Endangered and Nongame Species Program to map critical habitat for rare animal species. Some of the rare species data in the Landscape Project is in the Natural Heritage Database, while other records were obtained from other sources. Natural Heritage Database response letters will list all species (if any) found during a search of the Landscape Project. However, any reports that are included with the response letter will only reference specific records if they are in the Natural Heritage Database. This office cannot answer any inquiries about the Landscape Project. All questions should be directed to the DEP Division of Fish and Wildlife, Endangered and Nongame Species Program, P.O. Box 400, Trenton, NJ 08625-0400.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

Project Site: Cellofilm Corporation

Animal species within 4 miles of referenced site.

Common Name	Scientific Name	Federal Status	State Status	Grank	Srank
American coot	*Fulica americana*		D	G5	S1B
black-crowned night-heron foraging habitat	*Nycticorax nycticorax*		T/S	G5	S3B,S4N
checkered white	*Pontia protodice*		T	G4	S1
coastal heron rookery				GU	S3
colonial waterbird foraging habitat					
peregrine falcon	*Falco peregrinus*		E	G4	S1B,S?N
pied-billed grebe	*Podilymbus podiceps*	Special Concern	E/S	G5	S1B,S3N
savannah sparrow	*Passerculus sandwichensis*		T/T	G5	S2B,S4N
upland sandpiper	*Bartramia longicauda*		E	G5	S1B

12 OCT 2004

GENERAL VICINITY OF PROJECT SITE
RARE PLANT SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vascular plants								
PTELEA TRIFOLIATA	WAFER-ASH		E		G5T5	S1	1997-08-27	Y

1 Records Processed

(4)

Project Site: Cellofilm Corporation Waterways

On or within 1/4 mile of waterways

Common Name	Scientific Name	Federal Status	State Status	Grank	Srank
black-crowned night-heron foraging habitat	*Nycticorax nycticorax*		T/S	G5	S3B,S4N
black-crowned night-heron nesting habitat	*Nycticorax nycticorax*		T/S	G5	S3B,S4N
coastal heron rookery				GU	S3
colonial waterbird foraging habitat					
colonial waterbird nesting habitat					
peregrine falcon	*Falco peregrinus*		E	G4	S1B,S?N
yellow-crowned night-heron foraging habitat	*Nyctanassa violacea*		T/T	G5	S2B
yellow-crowned night-heron nesting habitat	*Nyctanassa violacea*		T/T	G5	S2B
Common Name	Scientific Name	Federal Status	State Status	Grank	Srank
checkered white	*Pontia protodice*		T	G4	S1

6

Frequently Asked Questions About Natural Heritage Priority Sites

What are Natural Heritage Priority Sites?
Through its Natural Heritage Database, the Office of Natural Lands Management (ONLM) identifies critically important areas to conserve New Jersey's biological diversity. The database provides detailed, up-to-date information on rare species and natural communities to planners, developers, and conservation agencies for use in resource management, environmental impact assessment, and both public and private land protection efforts.

Using the database, ONLM has identified Natural Heritage Priority Sites that represent some of the best remaining habitat for rare species and exemplary natural communities in the state. These areas should be considered to be top priorities for the preservation of biological diversity in New Jersey. If these sites become degraded or destroyed, we may lose some of the unique components of our natural heritage.

ONLM has identified 410 priority sites over the course of more than 10 years. We have received assistance from many partner individuals and agencies over this time. The Nature Conservancy and the DEP Endangered and Nongame Species Program have provided key information or assisted with the delineation of a number of the sites.

How are Natural Heritage Priority Site maps used in conservation of biological diversity?
Natural Heritage Priority Site maps are used by individuals and agencies concerned with the protection and management of land. The maps have been used by municipalities preparing natural resource inventories; public and private conservation organizations preparing open space acquisition goals; land developers and consultants identifying environmentally sensitive lands; and public and private landowners developing land management plans.

Natural Heritage Priority Sites contain some of the best and most viable occurrences of endangered and threatened species and natural communities, but they do not cover all known habitat for endangered and threatened species in New Jersey. If information is needed on whether or not endangered or threatened species have been documented from a particular piece of land, a Natural Heritage Database search can be requested by contacting the Office of Natural Lands Management at the address below.

What do the boundaries of the sites contain?
The boundaries of each Natural Heritage Priority Site are drawn to encompass critical habitat for the rare species or natural communities. Often the boundaries extend to include additional buffer lands that should be managed to protect the habitat. A justification for the boundary is provided for each site. The term "primary bounds" is sometimes used to refer to boundaries enclosing critical habitat. The term "secondary bounds" is sometimes used to refer to boundaries enclosing additional buffer. In maps where both primary and secondary boundaries are described, only the outermost boundary is provided in the mapping.

What is the background map that the sites are drawn upon?
The sites are portrayed on background maps produced from a digital copy of the U.S. Geological Survey 7.5 minute topographic maps. The background maps contain topographic lines as well as streams, lakes, roads, towns and place names. These background maps do not always reflect recent changes in land development. Some may be more than 20 years old. Some sites appear to be shifted in position against this topo map. This shift is due to the fact that most sites have been digitized against a background of rectified aerial photography, and some of the digitized USGS topo maps do not align with this photography.

What do "public lands" depict on the maps?
The "public lands" shaded on these maps are state-owned open space lands that have been digitized as a GIS coverage by the state Green Acres Program. This information is provided to show patterns of State land ownership in the vicinity of the Priority Site. The public lands are areas such as State Parks and Forests, Wildlife Management Areas, and Natural Lands Trust preserves. They do not currently include lands owned by other state agencies, federal, county or municipal governments

or nonprofit conservation organizations. This GIS coverage is constantly being updated, and therefore future editions of the maps will likely contain additional public lands that are not currently mapped as such.

What is the biodiversity significance rank and how is it used?

Each site is ranked according to its significance for biological diversity using a scale developed by The Nature Conservancy and the network of Natural Heritage Programs. The ranks can be used to distinguish between sites that are of global significance for conservation of biological diversity vs. those that are of state significance. The scale ranges from B1 to B5 with sites ranked B1-B3 generally being of global significance and sites ranked B4-B5 being of state significance. The specific definitions for each rank are as follows:

B1 - Outstanding significance, generally the "last of the least" in the world, such as the only known occurrence of any element (species or natural community), the best or an excellent occurrence of an element ranked critically imperiled globally, or a concentration (4+) of good or excellent occurrences of elements that are imperiled or critically imperiled globally. The site should be viable and defensible for the elements or ecological processes contained.

B2 - Very high significance, such as the most outstanding occurrence of any natural community. Also includes areas containing other occurrences of elements that are critically imperiled globally, a good or excellent occurrence of an element that is imperiled globally, an excellent occurrence of an element that is rare globally, or a concentration (4+) of good occurrences of globally rare elements or viable occurrences of globally imperiled elements.

B3 - High significance, such as any other viable occurrence of an element that is globally imperiled, a good occurrence of a globally rare element, an excellent occurrence of any natural community, or a concentration (4+) of good or excellent occurrences of elements that are critically imperiled in the State.

B4 - Moderate significance, such as a viable occurrence of a globally rare element, a good occurrence of any natural community, a good or excellent occurrence or only viable state occurrence of an element that is critically imperiled in the State, an excellent occurrence of an element that is imperiled in the State, or a concentration (4+) of good occurrences of elements that are imperiled in the State or excellent occurrences of elements that are rare in the State.

B5 - Of general biodiversity interest.

How can I obtain Natural Heritage Priority Site maps for an area of interest to me?

Natural Heritage Priority Site hard copy maps can be obtained by submitting a written request accompanied by a check or money order made payable to the Office of Natural Lands Management at the following address:

Office of Natural Lands Management
P.O. Box 404
Trenton, NJ 08625-0404
Phone: 609-984-1339; Fax: 609-984-1427

Individual 8.5" X 11" maps are available at the following rate:

1 - 10 site maps & reports:	$1.50/site
11 - 20 site maps & reports:	$1.00/site
> 20 sites:	$0.50/site

Digital GIS Coverage of Natural Heritage Priority Sites

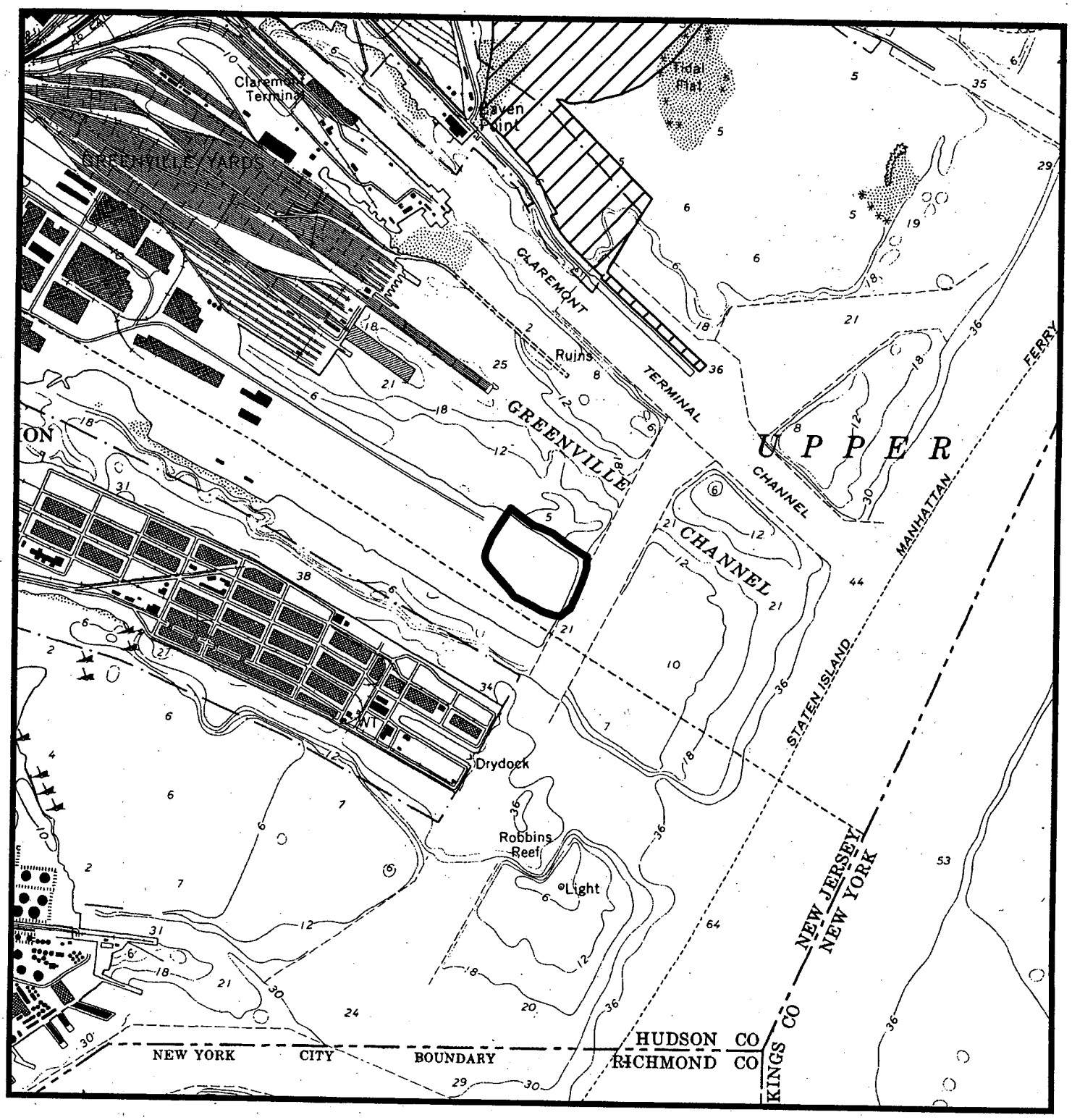
A digital version of the ArcView GIS file of Natural Heritage Priority Sites is also available. The zipped version of the file is approximately 1 MB in size. The 2001 version of Natural Heritage Priority Sites will be emailed upon request. The 1999 version of the digital files can be obtained on the internet at the following address: *http://www.state.nj.us/dep/gis/* -Click on "GIS Data Downloads" and then "Select a data layer" and then "Natural Heritage Priority Sites". There is no charge for emailing or downloading the GIS data.

How often are the maps updated?

The Natural Heritage Priority Site information is constantly being updated in the Natural Heritage Database. A new edition of the maps will be made available after significant revisions or additions to the Database.

April 9, 2002

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management



Natural Heritage Priority Site

Global Terminal Site

Hudson County

9

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

0.3 0 0.3 Miles

Priority Site
Public Land

N W E S

Natural Heritage Priority Site

Global Terminal Site

Locational Information

Quad Name: Jersey City
County: Hudson
Municipality Jersey City

Description of Site

Man-made spoil fill with sand substrate in the Upper Bay, Hudson River. In a highly industrialized region, east of Bayonne and north of the U.S. Naval Reservation.

Boundary Justification

Boundaries drawn to include habitat for a rare bird species.

Biodiversity Rank B5

Contains a State endangered bird species.

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

July, 2001
Site Code: S.USNJHP1*245

Natural Heritage Priority Site

Kearny Marsh

Hudson County

11

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

0.4 0 0.4 Miles

Priority Site
Public Land

N W E S

Natural Heritage Priority Site

Kearny Marsh

Locational Information

Quad Name: Orange ; Weehawken
County: Hudson
Municipality Kearny Town

Description of Site

Remnant glacial lake wetlands complex which lies east southeast of the town of Kearny and is bordered by Conrail tracks to the south, west and north, and the New Jersey Turnpike to the east.

Boundary Justification

Boundaries drawn to include habitat for animal species.

Biodiversity Rank B5

Site contains a State endangered bird species, a heron rookery and an additional bird species of special concern.

NATURAL HERITAGE GRID MAPS

The Natural Heritage Database documents rare species and natural community habitat to inform decision-makers who need to address the conservation of natural resources. Requests can be made for custom searches of the Natural Heritage Database to identify species and natural communities documented to occur in localized areas. Because illegal collection and vandalism threaten many rare species, release of sensitive information is restricted to limited areas and interested parties.

The Natural Heritage Grid Map is produced using geographic information system (GIS) software to provide a general portrayal of the locations of rare plant species and natural communities for the entire state without providing sensitive detailed information. It does not contain data for animal species. By consulting the map, users can do broad scale analysis of potentially sensitive areas, and learn of specific areas where a custom search of the Natural Heritage Database is needed for land use decision-making. A custom search can then be initiated by submitting a Natural Heritage Data Request Form for the specific parcels in question.

The Natural Heritage Grid Map uses a computer-generated grid that divides each USGS 1:24,000 scale topographic map into 100 cells, each cell being between 358 and 372 acres in size. If a rare plant species or natural community has been documented from anywhere within a cell, the entire cell will be coded as containing an occurrence of a rare plant species/natural community. To use these maps, locate the area of interest on the USGS topographic quadrangle base map. Determine if the cells in this area contain a letter code. There are three possible codes:

S – The location of an occurrence of a rare plant species or natural community is precisely known and falls somewhere within the cell.

M – The location of the rare plant species or natural community occurrence is not precisely known; the documented location is only known to within 1.5 miles.

B – Both precisely known (S) and less precise (M) occurrences for rare plant species or natural communities are found within the same cell.

This map is not a complete record of rare and endangered species habitat for this area. **It does not contain data for animal species.** It reflects data on known occurrences compiled as of the date printed in the lower right corner of each map. It includes both historically and recently documented habitat. Uncoded cells may also contain unsurveyed habitat that is occupied by imperiled plant species and natural communities. This product will be updated on a periodic basis. For more information, contact the Office of Natural Lands Management, PO Box 404, Trenton, NJ 08625.

The Natural Heritage Grid Map is available as an ArcView GIS shape file. The zipped version of the file is under 1 MB in size, and will be sent as an email attachment. Contact the Office of Natural Lands Management to obtain a copy of the file via email.

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

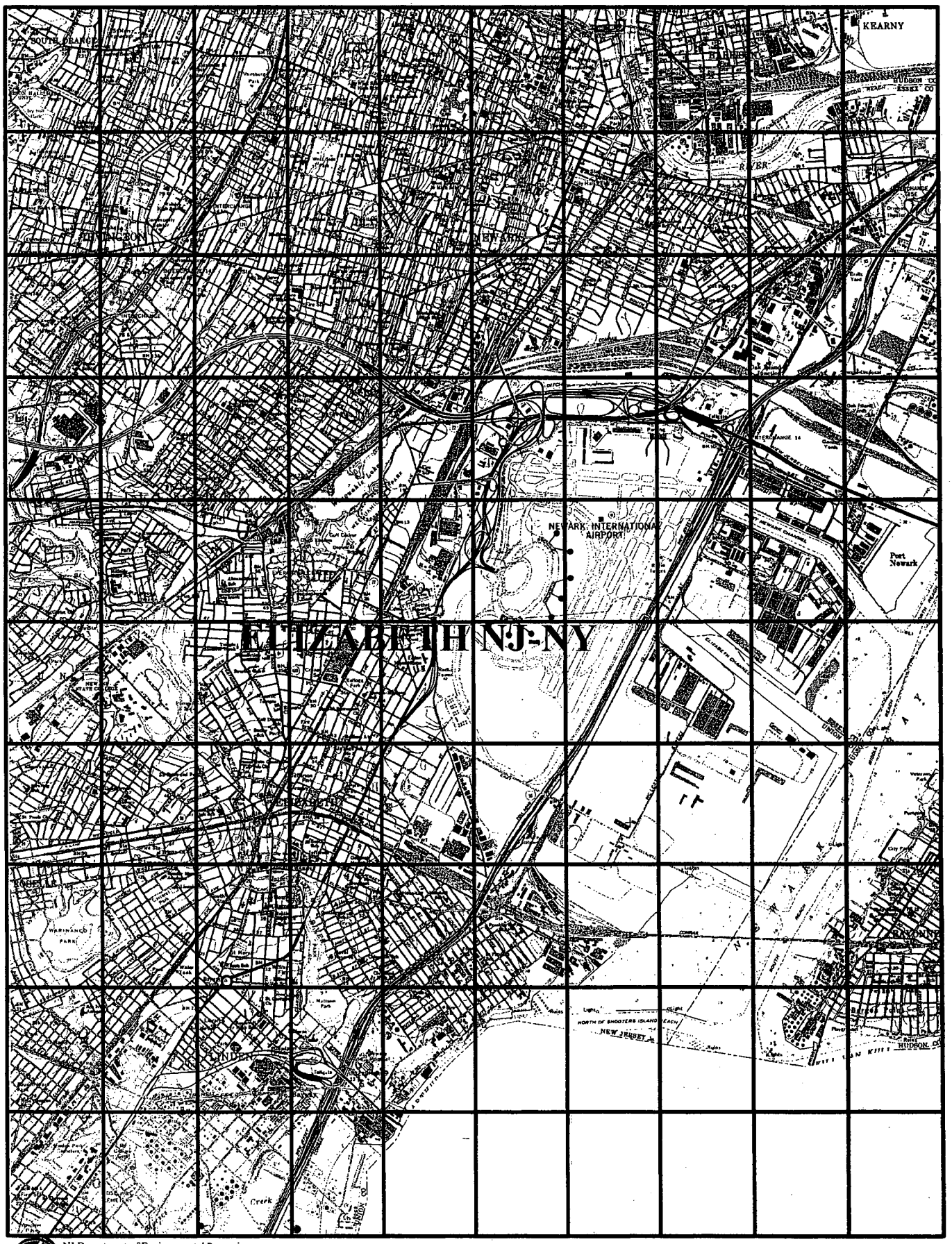
Natural Heritage Grid Map

Rare Plant Species and Natural Communities

S - Documented Location Known Precisely

M - Documented Location Known Within 1.5 Miles

B - Both 'M' and 'S' occurrences



NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

0.5 0 0.5 1 Miles

(14)

June 2002

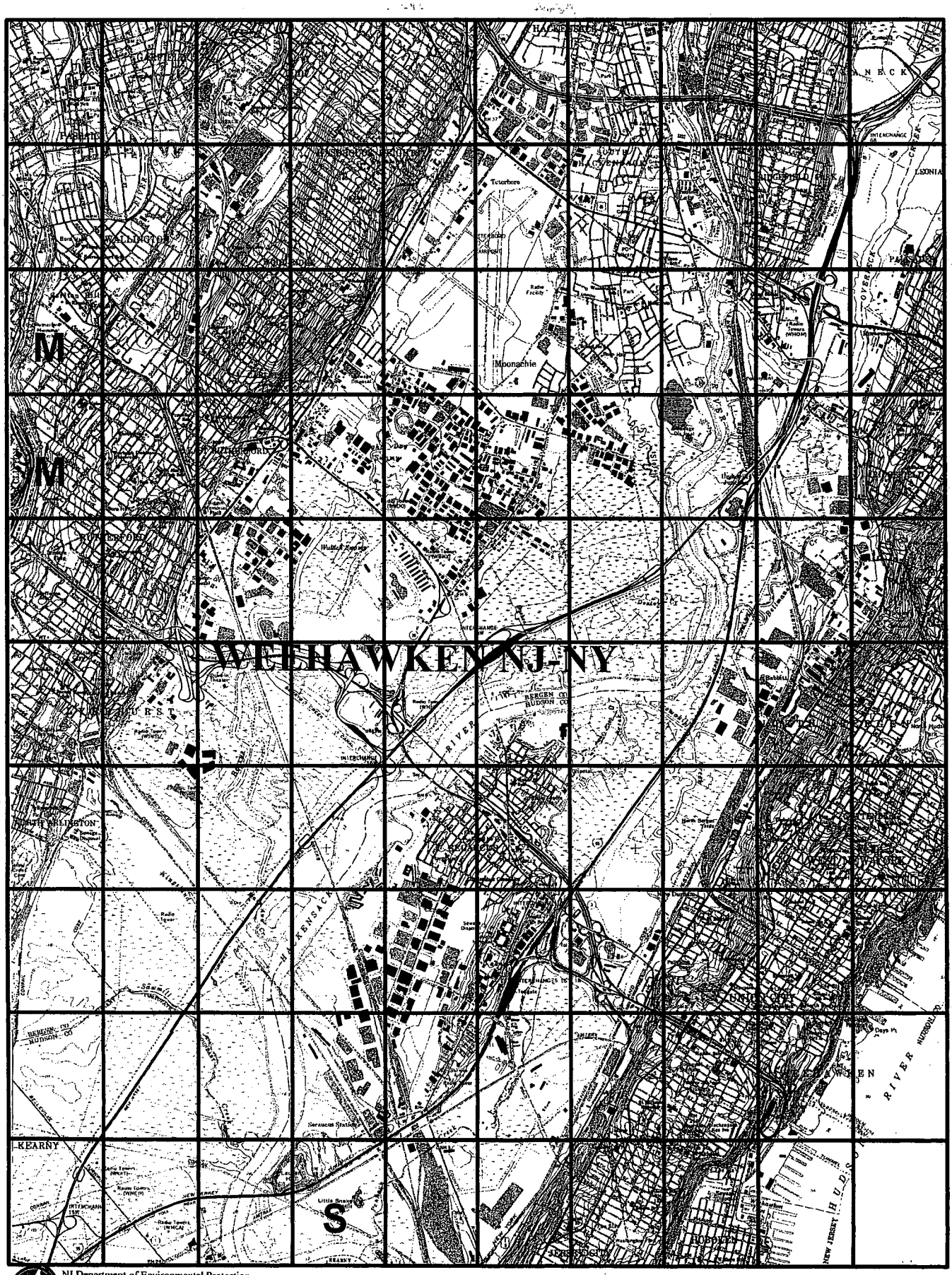
Natural Heritage Grid Map

Rare Plant Species and Natural Communities

S - Documented Location Known Precisely

M - Documented Location Known Within 1.5 Miles

B - Both 'M' and 'S' occurrences



NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

0.5 0 0.5 1 Miles

15

June 2002

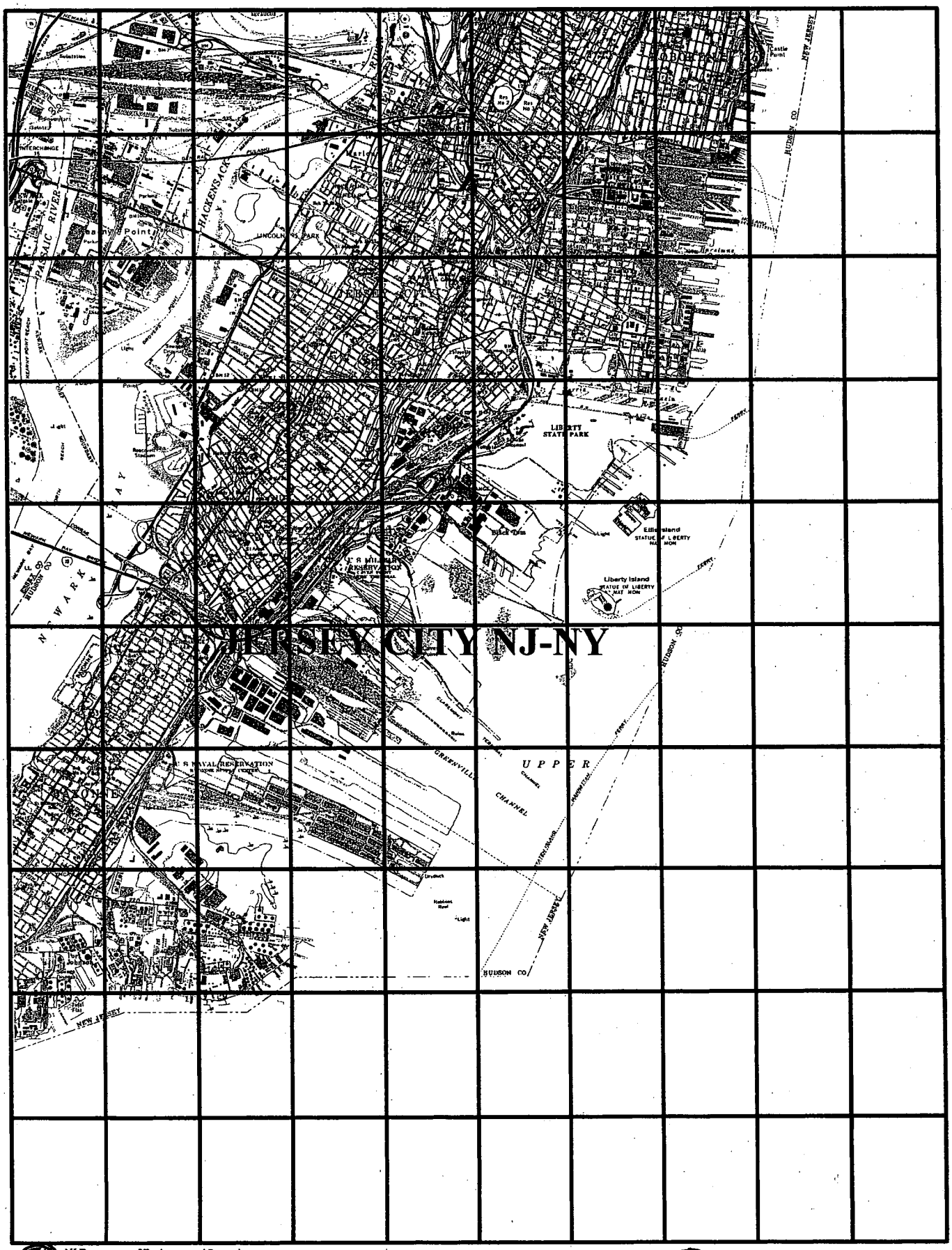
Natural Heritage Grid Map

Rare Plant Species and Natural Communities

S - Documented Location Known Precisely

M - Documented Location Known Within 1.5 Miles

B - Both 'M' and 'S' occurrences



NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

0.5 0 0.5 1 Miles

June 2002

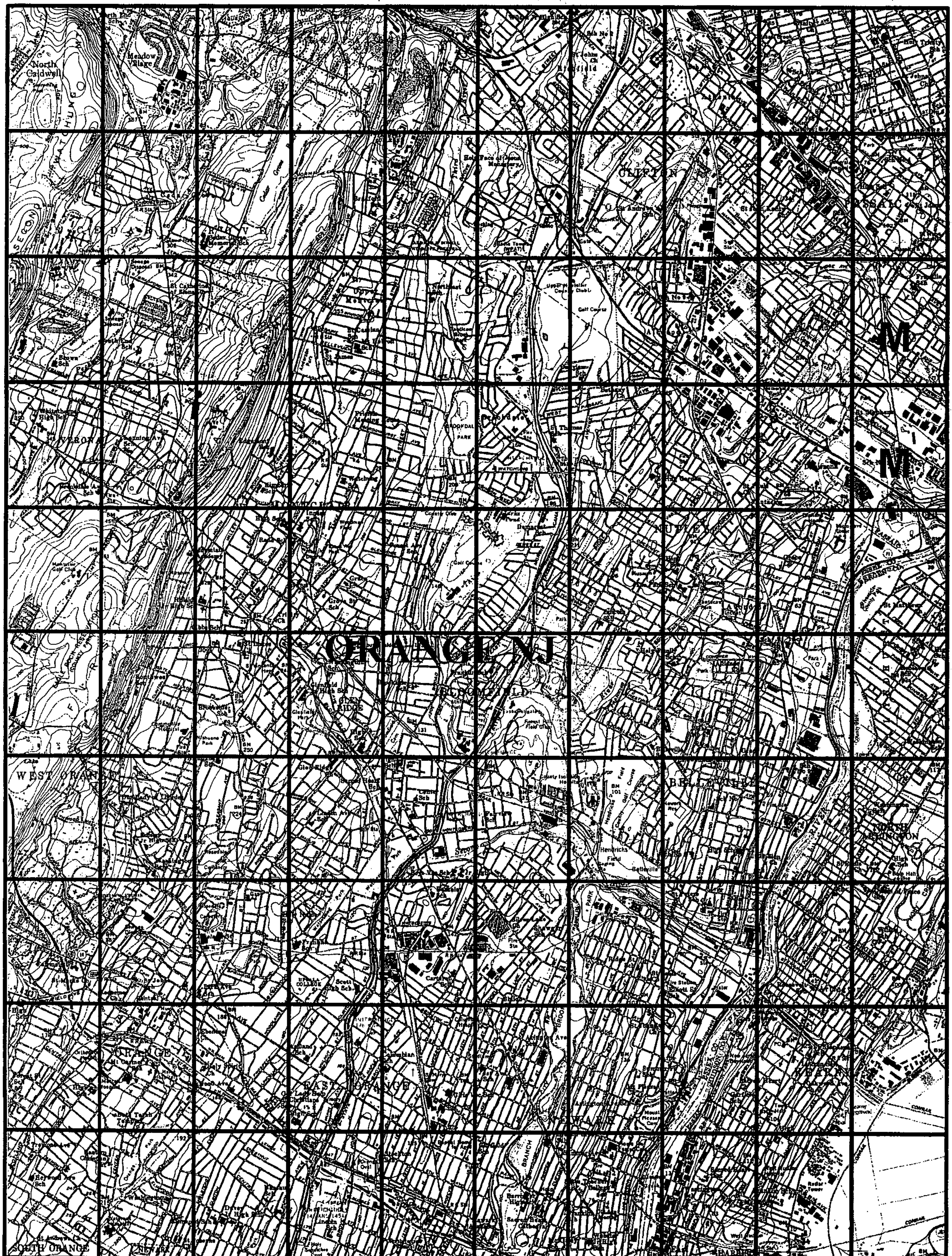
Natural Heritage Grid Map

Rare Plant Species and Natural Communities

S - Documented Location Known Precisely

M - Documented Location Known Within 1.5 Miles

B - Both 'M' and 'S' occurrences



NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

0.5 0 0.5 1 Miles

17

June 2002

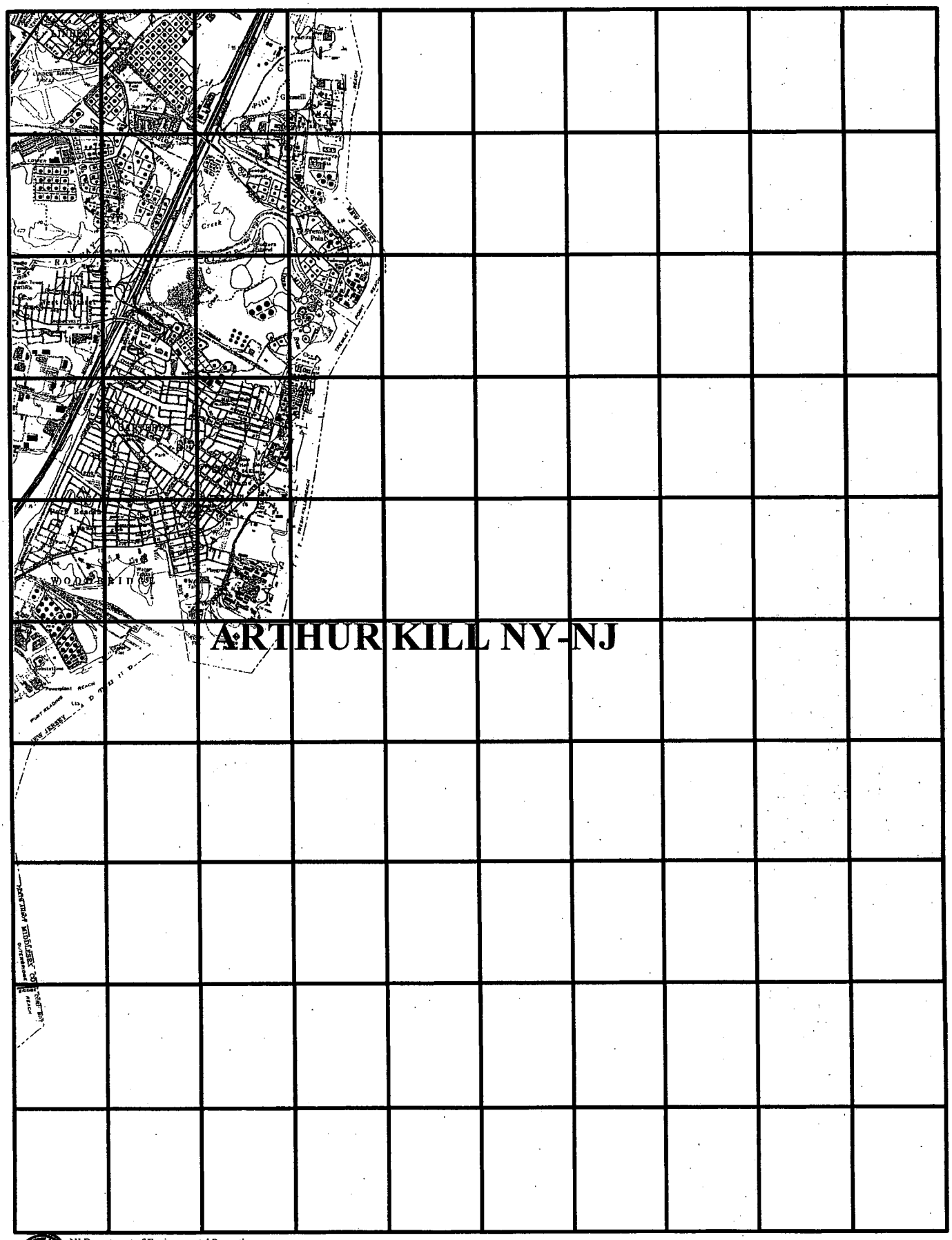
Natural Heritage Grid Map

Rare Plant Species and Natural Communities

S - Documented Location Known Precisely

M - Documented Location Known Within 1.5 Miles

B - Both 'M' and 'S' occurrences



NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

0.5 0 0.5 1 Miles

June 2002

Reference 25

PROJECT NOTE	REGION II SITE ASSESSMENT TEAM

To: Cellofilm File **Date:** December 6, 2004 **Page:** 1 of 1

W.O. No.: 20103.001.001.1078.00

From: Michele Capriglione, Region II SAT

Subject: RCRA Search for Lomma Trucking

This project note documents that the online RCRA database found at the following URL: http://yosemite.epa.gov/osw/rcra.nsf/search was searched for any information pertaining to Lomma Trucks or Lomma Trucking and there were no search results revealed.

Michele Capriglione

Michele Capriglione

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Reference 26

The EDR Radius Map
with GeoCheck®

Cellofilm
45-5 Cornelia Street
Newark, NJ 07105

Inquiry Number: 10983109.3p

May 23, 2003

Environmental Data Resources, Inc.

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06890

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

FORM-DJV

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GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

45-5 CORNELIA STREET
NEWARK, NJ 07105

COORDINATES

Latitude (North):	40.737800 - 40' 44' 16.1"
Longitude (West):	74.137300 - 74' 8' 14.3"
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	572843.5
UTM Y (Meters):	4509797.5
State Plane X (Feet):	2146701.0
State Plane Y (Feet):	694157.5
Elevation:	9 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	2440074-F2 ELIZABETH, NJ NY
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following government records. For more information on this property see page 6 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
CELLOFILM CORPORATION 45-5 CORNELIA STREET NEWARK, NJ 07105	CERCLIS RCRIS-LQG RCRIS-TSD FINDS RAATS	NJD000813451

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

ERNS..... Emergency Response Notification System

3

EXECUTIVE SUMMARY

STATE ASTM STANDARD

SWF/LF..... Solid Waste Facility Directory

FEDERAL ASTM SUPPLEMENTAL

Delisted NPL..... National Priority List Deletions
HMIRS..... Hazardous Materials Information Reporting System
MLTS..... Material Licensing Tracking System
MINES..... Mines Master Index File
NPL Liens..... Federal Superfund Liens
PADS..... PCB Activity Database System
DOD..... Department of Defense Sites
TRIS..... Toxic Chemical Release Inventory System
TSCA..... Toxic Substances Control Act
SSTS..... Section 7 Tracking Systems
FTTS..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

NJ PF..... Publicly Funded Cleanups Site Status Report
CHROME..... Chromate Chemical Production Waste Sites
NJPDES..... New Jersey Pollutant Discharge Elimination System Dischargers

BROWNFIELDS DATABASES

INST CONTROL..... Sites With Closed Case(s) With Restrictions

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. EDR's definition of a site with an elevation equal to the target property includes a tolerance of +/- 10 feet. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property (by more than 10 feet). Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL ASTM STANDARD

NPL: Also known as Superfund, the National Priority List database is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund program. The source of this database is the

U.S. EPA.

A review of the NPL list, as provided by EDR, and dated 01/29/2003 has revealed that there are 2 NPL sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
DIAMOND ALKALI CO.	*80 LISTER AVE*	*0 - 1/8 NNE*	*0*	*6*
DIAMOND HEAD OIL REFINERY DIV.	*1401 HARRISON TURNPIKE*	*1/2 - 1 NNE*	*AY257*	*626*

Proposed NPL: Proposed NPL sites . The source of this database is the U.S. EPA.

A review of the Proposed NPL list, as provided by EDR, and dated 01/29/2003 has revealed that there is 1 Proposed NPL site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
DIAMOND HEAD OIL REFINERY DIV.	*1401 HARRISON TURNPIKE*	*1/2 - 1 NNE*	*AY257*	*626*

CERCLIS: The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).
CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the CERCLIS list, as provided by EDR, and dated 03/19/2003 has revealed that there are 5 CERCLIS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
DIAMOND ALKALI CO.	*80 LISTER AVE*	*0 - 1/8 NNE*	*0*	*6*
REICHHOLD CHEMICALS	*46 ALBERT AVE*	*0 - 1/8 SW*	*E21*	*49*
BRADY IRON & METAL CO	*55-59 LOCKWOOD ST*	*1/4 - 1/2 SE*	*128*	*305*

Lower Elevation	Address	Dist / Dir	Map ID	Page
FAIRMOUNT CHEMICAL CO INC	*117 BLANCHARD ST*	*1/4 - 1/2 E*	*AL179*	*416*
NORPAK CORP	*70 BLANCHARD ST*	*1/4 - 1/2 E*	*AM184*	*443*

CERCLIS-NFRAP: As of February 1995. CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund Action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

A review of the CERC-NFRAP list, as provided by EDR, and dated 03/19/2003 has revealed that there are 3 CERC-NFRAP sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SHERWIN-WILLIAMS CO.	*BROWN STREET & LISTER A*	*0 - 1/8 N*	*7*	*23*

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
DURALAC CHEMICAL CORP.	*84 LISTER AVE.*	*0 - 1/8 NE*	*C18*	*42*
SCA CHEM SERVICES CO /EARTHLIN	*100 LISTER AVE*	*0 - 1/8 NE*	*C35*	*85*

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 03/31/2003 has revealed that there are 15 CORRACTS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SHERWIN-WILLIAMS CO.	*BROWN STREET & LISTER A*	*0 - 1/8 N*	*7*	*23*
DURALAC CHEMICAL CORP.	*84 LISTER AVE.*	*0 - 1/8 NE*	*C18*	*42*
SCA CHEM SERVICES CO /EARTHLIN	*100 LISTER AVE*	*0 - 1/8 NE*	*C35*	*85*
BRILL EQUIP CO	*35 JAMES ST*	*1/4 - 1/2 S*	*AN187*	*451*
BAYONNE BRL DRUM	*150 RAYMOND BLVD*	*1/2 - 1 ESE*	*AV238*	*599*
SUN/DIC ACQUISITION CORP.	*185 FOUNDRY ST.*	*1/2 - 1 SSE*	*AW242*	*606*
CAMPBELL FOUNDRY CO	*1235 HARRISON AVE*	*1/2 - 1 N*	*261*	*636*
G & S MOTOR EQUIPMENT CO	*1800 HARRISON AVE*	*1/2 - 1 N*	*264*	*641*
LIQUID CARBONIC CORP	*603 BERGEN ST*	*1/2 - 1 WNW*	*267*	*647*
FEDERATED METALS CORP	*150 SAINT CHARLES ST*	*1/2 - 1 SSW*	*BB272*	*651*
COOK & DUNN PAINT CORP	*167 KOSSUTH ST*	*1/2 - 1 SSW*	*275*	*657*
BOCK ENTERPRISES INC	*1000 S 4TH ST BLDG 10 N*	*1/2 - 1 WSW*	*281*	*665*

Lower Elevation	Address	Dist / Dir	Map ID	Page
BENJAMIN MOORE CO	*134 LISTER AVE*	*1/8 - 1/4 ENE*	*Q87*	*223*
FAIRMOUNT CHEMICAL CO INC	*117 BLANCHARD ST*	*1/4 - 1/2 E*	*AL179*	*416*
NORPAK CORP	*70 BLANCHARD ST*	*1/4 - 1/2 E*	*AM184*	*443*

RCRIS: The Resource Conservation and Recovery Act database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act. The source of this database is the U.S. EPA.

A review of the RCRIS-TSD list, as provided by EDR, and dated 09/09/2002 has revealed that there are 9 RCRIS-TSD sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SHERWIN-WILLIAMS CO.	*BROWN STREET & LISTER A*	*0 - 1/8 N*	*7*	*23*
DURALAC CHEMICAL CORP.	*84 LISTER AVE.*	*0 - 1/8 NE*	*C18*	*42*
SCA CHEM SERVICES CO /EARTHLIN	*100 LISTER AVE*	*0 - 1/8 NE*	*C35*	*85*
APEX COLOR WORKS INC.	*64 CHAPEL STREET*	*1/4 - 1/2 SSW*	*X113*	*279*
BRILL EQUIP CO	*35 JAMES ST*	*1/4 - 1/2 S*	*AN187*	*451*
DELEET MERCHANDISING CORP	*26 BLANCHARD ST*	*1/4 - 1/2 ESE*	*AS224*	*547*

Lower Elevation	Address	Dist / Dir	Map ID	Page
BENJAMIN MOORE CO	*134 LISTER AVE*	*1/8 - 1/4 ENE*	*Q87*	*223*
HILTON DAVIS CHEMICAL CO THE	*120 LISTER AVE*	*1/4 - 1/2 NE*	*S98*	*248*
FAIRMOUNT CHEMICAL CO INC	*117 BLANCHARD ST*	*1/4 - 1/2 E*	*AL179*	*416*

RCRIS: The Resource Conservation and Recovery Act database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act. The source of this database is the U.S. EPA.

A review of the RCRIS-LQG list, as provided by EDR, and dated 09/09/2002 has revealed that there are 3 RCRIS-LQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SHERWIN-WILLIAMS CO.	*BROWN STREET & LISTER A*	*0 - 1/8 N*	*7*	*23*
REICHHOLD CHEMICALS	*46 ALBERT AVE*	*0 - 1/8 SW*	*E21*	*49*

Lower Elevation	Address	Dist / Dir	Map ID	Page
BENJAMIN MOORE CO	*134 LISTER AVE*	*1/8 - 1/4 ENE*	*Q87*	*223*

RCRIS: The Resource Conservation and Recovery Act database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act. The source of this database is the U.S. EPA.

A review of the RCRIS-SQG list, as provided by EDR, and dated 09/09/2002 has revealed that there are 18 RCRIS-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
LISTER AVE SITE	*80-120 LISTER AVE*	*0 - 1/8 NE*	*C15*	*38*
DURALAC CHEMICAL CORP.	*84 LISTER AVE.*	*0 - 1/8 NE*	*C18*	*42*
HISKO TRUCKING CO INC	*100 LISTER AVE*	*0 - 1/8 NE*	*C30*	*76*
SCA CHEM SERVICES CO /EARTHLIN	*100 LISTER AVE*	*0 - 1/8 NE*	*C35*	*85*
DRUM SERVICE OF NEWARK INC	*104 LISTER AVE*	*0 - 1/8 NE*	*F48*	*140*
INDUSTRIAL WASTE TECHNOLOGIES	*8 LISTER AVE*	*1/8 - 1/4 W*	*H58*	*168*
WALTER R RAY HOLDING CO INC	*86-92 LISTER AVE - REAR*	*1/8 - 1/4 ENE*	*63*	*175*
REUSCHE & CO OF TWS INC	*2 LISTER AVE*	*1/8 - 1/4 W*	*H67*	*181*
L REUSCHE & CO LIQUIDATING TRU	2-6 LISTER AVE	1/8 - 1/4 W	H68	181
B-LINE TRUCKING INC	*67 ESTHER ST*	*1/8 - 1/4 E*	*69*	*181*
AJ & JO PILAR INC	*145 CHAPEL ST*	*1/8 - 1/4 SW*	*M75*	*190*
HERAEUS INC	*65 EUCLID AVE*	*1/8 - 1/4 SSE*	*O79*	*202*
STANLEY TOOLS NEWARK	*140 CHAPEL ST*	*1/8 - 1/4 SW*	*M81*	*207*
ATLAS REFINERY INC	*142 LOCKWOOD ST*	*1/8 - 1/4 E*	*P84*	*216*
FISKE BROTHERS REFINING CO	*129 LOCKWOOD ST*	*1/8 - 1/4 ESE*	*95*	*244*
REDDAWAY MANUFACTURING CO INC	*32 EUCLID AVE*	*1/8 - 1/4 SE*	*R96*	*245*

Lower Elevation	Address	Dist / Dir	Map ID	Page
HUG HOLDINGS	*99 CHAPEL ST*	*1/8 - 1/4 W*	*L73*	*187*
CANAL SANITATION INC	*99 CHAPEL ST - 1ST FLOO*	*1/8 - 1/4 W*	*L74*	*190*

STATE ASTM STANDARD

SHWS: Known contaminated sites in New Jersey except those associated with Bureau of Underground Storage Sites (BUST)

A review of the SHWS list, as provided by EDR, has revealed that there are 73 SHWS sites within approximately 1 mile of the target property.

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Dist / Dir		Map ID	Page
SHERWIN WILLIAMS COMPANY	60 LISTER AVE	0 - 1/8	NNW	A6	22
DIAMOND ALKALI COMPANY	80 LISTER AVE	0 - 1/8	NE	C14	38
REICHOLD CHEMICALS INCORPORATE	46 ALBERT AVE	0 - 1/8	SW	E22	55
SCA CHEM SERVICES CO /EARTHLIN	***100 LISTER AVE***	***0 - 1/8***	***NE***	***C35***	***85***
PALMER INDUSTRIES INCORPORATED	***8 LISTER AVE***	***1/8 - 1/4***	***W***	***H57***	***168***
GEORGE A MATHEWSON CO INC	***415 RAYMOND BLVD***	***1/4 - 1/2***	***S***	***T103***	***256***
D & L AUTO PARTS	***349 RAYMOND BLVD***	***1/4 - 1/2***	***SSE***	***Y114***	***279***
RAYMOND PETROLEUM INC	***303 RAYMOND BLVD***	***1/4 - 1/2***	***SE***	***Y119***	***292***
PPD CORPORATION	***574 FERRY ST***	***1/4 - 1/2***	***S***	***AD142***	***331***
PPD CORPORATION	574 FERRY ST	1/4 - 1/2	S	AD143	332
BELL CONTAINER CORP	***615 FERRY ST***	***1/4 - 1/2***	***SSE***	***AF151***	***346***
TRIANGLE TOWING SERVICE INC	***666 FERRY ST***	***1/4 - 1/2***	***SE***	***AI160***	***376***
NJ TRANSIT BUS OPERATIONS INCO	703 FERRY ST	1/4 - 1/2	SE	AJ170	399
R HORIZON PAPER	38-60 BLANCHARD ST	1/4 - 1/2	ESE	AP200	484
OBRIEN COGENERATION INCORPORAT	***35 BLANCHARD ST***	***1/4 - 1/2***	***ESE***	***AP214***	***527***
COOPER LIGHTING INCORPORATED	84 FOUNDRY ST	1/4 - 1/2	SSE	AQ217	532
HURLEY FORGE INC	***70 MANUFACTURERS PL***	***1/4 - 1/2***	***S***	***AR218***	***532***
NEWARK BOXBOARD CO	***17 BLANCHARD ST***	***1/2 - 1***	***ESE***	***AS229***	***586***
DUBLON INCORPORATED	***84 WAYDELL ST***	***1/2 - 1***	***SSE***	***230***	***591***
V OTTILIO & SONS	18 TO 60 BLANCHARD ST	1/2 - 1	ESE	AS231	591
15E SANITARY LANDFILL	RTE 1 / FOUNDRY ST	1/2 - 1	SSE	AU235	595
NEWARK DRIVE IN	104 TO 108 FOUNDRY ST	1/2 - 1	SSE	AU236	595
NEWARK COAL GAS (PSE&G)	***155 RAYMOND BLVD***	***1/2 - 1***	***ESE***	***AV237***	***595***
CAMPBELL FOUNDRY COMPANY	***800 BERGEN ST.***	***1/2 - 1***	***NW***	***239***	***603***
NORPAK CORPORATION	FOUNDRY ST / ROANOAKE	1/2 - 1	SSE	AW240	605
ALL COUNTY ENVIRONMENTAL SERVI	***193 CHRISTIE ST***	***1/2 - 1***	***S***	***241***	***605***
FOUNDRY STREET COMPLEX	185 FOUNDRY ST	1/2 - 1	SSE	AW243	609
AVON DRUM COMPANY	185 FOUNDRY ST	1/2 - 1	SSE	AW244	609
SUN DIC ACQUISITION CORPORATIO	***185 FOUNDRY ST***	***1/2 - 1***	***SSE***	***AW245***	***609***
SUN DIC ACQUISITION CORPORATIO	185 FOUNDRY ST	1/2 - 1	SSE	AW246	610
DRESSER PUMP INDUSTRIES INCORP	401 WORTHINGTON AVE	1/2 - 1	NW	247	610
EAGLE AFFILIATES	***505 MANOR AVE***	***1/2 - 1***	***NW***	***248***	***610***
NJ TURNPIKE & RAYMOND BOULEVAR	***NJ TPKE / RAYMOND BLV***	***1/2 - 1***	***ESE***	***249***	***615***
SERVICE STATION NEWARK CITY	364 FERRY ST	1/2 - 1	SW	250	616
TIDEWATER BALING	***26 ST. CHARLES ST.***	***1/2 - 1***	***SW***	***251***	***617***
ASHLAND CHEMICAL COMPANY	221 FOUNDRY ST	1/2 - 1	SSE	252	619
LIQUID CARBONIC SPECIALTY GAS	670 ESSEX ST	1/2 - 1	WNW	253	620
DREW CHEMICAL CORPORATION	1106 HARRISON AVE	1/2 - 1	NNW	AX254	620
SOS GASES INC	***1100 HARRISON AVE***	***1/2 - 1***	***NNW***	***AX255***	***620***
DIAMOND HEAD OIL REFINERY	1401 HARRISON TPKE	1/2 - 1	NNE	AY256	625
WELCO GASES CORPORATION	49 SAINT CHARLES ST	1/2 - 1	SW	258	629
CENTRAL SALVAGE CO	***1221 HARRISON AVE***	***1/2 - 1***	***N***	***259***	***630***
A L WILSON CHEMICAL	***1050 HARRISON AVE***	***1/2 - 1***	***NNW***	***260***	***635***
CAMPBELL FOUNDRY CO	***1235 HARRISON AVE***	***1/2 - 1***	***N***	***261***	***636***
KEARNY SMELTING & REFINING	***936 HARRISON AVE.***	***1/2 - 1***	***NNW***	***AZ262***	***639***
SUNOCO SERVICE STATION KEARNY	***936 HARRISON AVE***	***1/2 - 1***	***NNW***	***AZ263***	***640***
G & S MOTOR EQUIPMENT CO	***1800 HARRISON AVE***	***1/2 - 1***	***N***	***264***	***641***
MUNICIPAL SANITARY LANDFILL AU	***1500 HARRISON AVE***	***1/2 - 1***	***N***	***265***	***645***
HARRISON TOWN FIRE DEPARTMENT	***630 SUSSEX ST***	***1/2 - 1***	***WNW***	***266***	***647***
HARRISON BAKING COMPANY TRUCK	847 ANN ST	1/2 - 1	NW	BA268	650
HARRISON BAKING COMPANY TRUCK	847 ANN ST	1/2 - 1	NW	BA269	650
CELANESE CORPORATION OF AMERIC	ROME / SAINT CHARLES	1/2 - 1	SSW	270	650
CAMPBELL FOUNDRY COMPANY	2 WORTHINGTON WAY	1/2 - 1	NW	271	651
FEDERATED METALS CORPORATION	***150 ST CHARLES ST***	***1/2 - 1***	***SSW***	***BB273***	***655***
NEWARK CITY POLICE EAST DISTRI	649 MARKET ST	1/2 - 1	WSW	274	657
GEORGIA-PACIFIC CORPORATION	***290 FERRY STREET***	***1/2 - 1***	***SW***	***BD278***	***661***

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
COURTAULDS CPD INC	*290 FERRY ST*	*1/2 - 1 SW*	*BD279*	*662*
NEWARK SPECIAL TECHNOLOGY CO	*135 KOMON ST*	*1/2 - 1 SSW*	*280*	*663*
FRIEDMANS EXPRESS INCORPORATED	241 AVENUE P	1/2 - 1 SSE	282	666
KESTER SOLDER	*88 FERGUSON ST*	*1/2 - 1 WSW*	*285*	*667*
ROYCE ASSOCIATES A LTD PARTNER	*207-15 AVE L*	*1/2 - 1 SSW*	*287*	*672*

Lower Elevation	Address	Dist / Dir	Map ID	Page
HUG HOLDINGS	*99 CHAPEL ST*	*1/8 - 1/4W*	*L73*	*187*
HILTON DAVIS CHEMICAL CO THE	*120 LISTER AVE*	*1/4 - 1/2NE*	*S98*	*248*
DELISA PALLET CORP	*91-97 BLANCHARD ST*	*1/4 - 1/2E*	*173*	*403*
NORPAK CORPORATION	70 BLANCHARD ST	1/4 - 1/2E	AM186	451
TRANSCOPE REALTY	*169 BLANCHARD ST*	*1/2 - 1 ENE*	*AT232*	*591*
ROSE COLOR INCORPORATED	*170-188 BLANCHARD ST*	*1/2 - 1 ENE*	*AT233*	*593*
INTERNATIONAL METALLURGICAL SE	*196 BLANCHARD STREET*	*1/2 - 1 ENE*	*234*	*594*
CHEMICAL WASTE MANAGEMENT INCO	*41 TO 85 DOREMUS AVE*	*1/2 - 1 ESE*	*BC276*	*659*
HERTZ EQUIPMENT RENTAL	*41-85 DOREMUS AVE SITE*	*1/2 - 1 ESE*	*BC277*	*659*
HARTZ MOUNTAIN CORPORATION	*700 FRANK E RODGERS BLV*	*1/2 - 1 WNW*	*BE284*	*666*
QUALITY CARRIERS INC	*80 DOREMUS AVE*	*1/2 - 1 ESE*	*BF286*	*668*
GETTY	*86 DOREMUS AVE*	*1/2 - 1 SE*	*BF288*	*673*

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environmental Protection & Energy's Incident Report.

A review of the LUST list, as provided by EDR, and dated 09/17/2002 has revealed that there are 25 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
WUHL SHAFMAN LIFEBERMAN CORP	*52 CORNELIA STREET*	*0 - 1/8 SSE*	*B8*	*24*
B-LINE TRUCKING INC	*67 ESTHER ST*	*1/8 - 1/4E*	*69*	*181*
REDDAWAY MFG INC	*32 EUCLID AVE*	*1/8 - 1/4SE*	*R97*	*246*
NEWARK CARTING	363-371 RAYMOND BOULEVA	1/4 - 1/2SSE	V110	275
D & L AUTO PARTS	*349 RAYMOND BLVD*	*1/4 - 1/2SSE*	*Y114*	*279*
JAMES J BRADY	*335-347 RAYMOND BLVD*	*1/4 - 1/2SSE*	*Y116*	*282*
GRAVER CHEMICAL DIV OF THE GRA	*72 LOCKWOOD ST*	*1/4 - 1/2SE*	*W118*	*289*
RAYMOND PETROLEUM	303 RAYMOND BLVD	1/4 - 1/2SE	Y121	298
RECYCLED FIBERS OF NEW JERSEY	*60 LOCKWOOD STREET*	*1/4 - 1/2SE*	*W124*	*301*
ACE TRUCK AND TRAILER REPAIR I	245 RAYMOND BLVD	1/4 - 1/2SE	Z125	302
ALL STATE PAPER BOX CO	*233 RAYMOND BLVD.*	*1/4 - 1/2SE*	*Z126*	*303*
STAR FINISHING INC (CONTACT) S	41 CHAPEL ST	1/4 - 1/2SSW	AA131	312
STAR FINISHING INC	*41 CHAPEL ST*	*1/4 - 1/2SSW*	*AA133*	*318*
POWER CONCRETE CO INC	*497 RAYMOND BLVD*	*1/4 - 1/2SW*	*AB134*	*319*
DELTA ENGINEERING	556 FERRY ST	1/4 - 1/2S	AC140	329
EUREKA SPRING CO INC	*9-15 MANUFACTURERS PL*	*1/4 - 1/2S*	*AC148*	*337*
BELL CONTAINER CORP	*615 FERRY ST*	*1/4 - 1/2SSE*	*AF151*	*346*
TRIANGLE TOWING SERVICE INC	*666 FERRY ST*	*1/4 - 1/2SE*	*AI160*	*376*
ENGINE 16 TRUCK COMPANY 8	496 FERRY STREET	1/4 - 1/2SSW	AO194	469
HAWKINS STREET SCHOOL	8 HAWKINS ST	1/4 - 1/2SSW	AO197	474
R. HORIZON PAPER	*38-60 BLANCHARD ST*	*1/4 - 1/2ESE*	*AP199*	*480*
DELEET MERCHANDISING CORP	*26 BLANCHARD ST*	*1/4 - 1/2ESE*	*AS224*	*547*

Lower Elevation	Address	Dist / Dir	Map ID	Page
HUG HOLDINGS	*99 CHAPEL ST*	*1/8 - 1/4W*	*L73*	*187*

Lower Elevation	Address	Dist / Dir	Map ID	Page
DELISA PALLET CORP	*91-97 BLANCHARD ST*	*1/4 - 1/2 E*	*173*	*403*
NORPAK CORPORATION	70 BLANCHARD STREET	1/4 - 1/2 E	AM185	450

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Protection & Energy's UST Data.

A review of the UST list, as provided by EDR, and dated 09/15/1999 has revealed that there are 10 UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
WUHL SHAFMAN LIFEBERMAN CORP	*52 CORNELIA STREET*	*0 - 1/8 SSE*	*B8*	*24*
DURALAC CHEMICAL CORP.	*84 LISTER AVE.*	*0 - 1/8 NE*	*C18*	*42*
REICHHOLD CHEMICALS	*46 ALBERT AVE*	*0 - 1/8 SW*	*E21*	*49*
CHEMICAL WASTE MANAGEMENT OF N	*100 LISTER AVENUE*	*0 - 1/8 NE*	*C24*	*57*
PALMER INDUSTRIES INC.	8 LISTER AVENUE	1/8 - 1/4 W	H59	169
B-LINE TRUCKING INC	*67 ESTHER ST*	*1/8 - 1/4 E*	*69*	*181*
AJ & JO PILAR INC	*145 CHAPEL ST*	*1/8 - 1/4 SW*	*M75*	*190*
STANLEY TOOLS NEWARK	*140 CHAPEL ST*	*1/8 - 1/4 SW*	*M81*	*207*
FISKE BROTHERS REFINING CO	*129 LOCKWOOD ST*	*1/8 - 1/4 ESE*	*95*	*244*
REDDAWAY MFG INC	*32 EUCLID AVE*	*1/8 - 1/4 SE*	*R97*	*246*

FEDERAL ASTM SUPPLEMENTAL

CONSENT: Major Legal settlements that establish responsibility and standards for cleanup at NPL (superfund) sites. Released periodically by U.S. District Courts after settlement by parties to litigation matters.

A review of the CONSENT list, as provided by EDR, has revealed that there is 1 CONSENT site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
DIAMOND ALKALI CO.	*80 LISTER AVE*	*0 - 1/8 NNE*	*0*	*6*

RODS: Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid the cleanup.

A review of the ROD list, as provided by EDR, has revealed that there is 1 ROD site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
DIAMOND ALKALI CO.	*80 LISTER AVE*	*0 - 1/8 NNE*	*0*	*6*

STATE OR LOCAL ASTM SUPPLEMENTAL

NJ Maj Facilities: 'Major Facility' means all facilities, located on one or more contiguous or adjacent properties owned or operated by the same person, having total combined storage capacity of: 1) 20,000 gallons or more for hazardous substances other than Petroleum or petroleum products; 2) 200,000 gallons or more for hazardous substances of all kinds.

A review of the NJ MAJOR FACILITIES list, as provided by EDR, and dated 01/02/2002 has revealed that there are 6 NJ MAJOR FACILITIES sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
ATLAS REFINERY, INC	142 LOCKWOOD ST	1/8 - 1/4 E	P83	214
MESSINGER TRUCKING AND WAREHOU	***84-132 LOCKWOOD STREET***	***1/4 - 1/2 ESE***	***W112***	***276***
SEIDLER CHEMICAL CO	***537 RAYMOND BLVD***	***1/4 - 1/2 SW***	***158***	***366***
CALPINE NEWARK, INC.	***35 BLANCHARD ST***	***1/4 - 1/2 ESE***	***AP202***	***491***
DELEET MERCHANDISING CORP	***26 BLANCHARD ST***	***1/4 - 1/2 ESE***	***AS224***	***547***

Lower Elevation	Address	Dist / Dir	Map ID	Page
FAIRMOUNT CHEMICAL CO., INC.	117 BLANCHARD STREET	1/4 - 1/2 E	AL176	410

NJ SPILLS: All hazmat known or unknown spills to the ground reported to the DEP's Env. Action Line. The office has not conducted any investigations to determine it's validity or accuracy.

A review of the NJ Spills list, as provided by EDR, has revealed that there are 108 NJ Spills sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
ROADWAY IN FRONT OF	60 LISTER AV	0 - 1/8 NNW	A2	9
SHERWIN WILLIAMS	***60 LISTER AVE***	***0 - 1/8 NNW***	***A3***	***13***
SHERMAN WILLIAMS	60 LISTER AVE	0 - 1/8 NNW	A5	20
PALMER INDUSTRIES	40 LISTER AVE	0 - 1/8 WNW	9	26
CAVILIER INTERNATIONAL AIR FR	93 ALBERT AVE	0 - 1/8 SSE	B10	31
CAVALIER AIR FREIGHT/NWK ARPT	93 ALBERT AV	0 - 1/8 SSE	B11	32
CAVILER INTERNAT'L	***93 ALBERT AVE***	***0 - 1/8 SSE***	***B12***	***34***
DURLAC CHEMICAL CO	80-90 LISTER AVE	0 - 1/8 NE	C13	37
RETSEIL CORP	84 LISTER	0 - 1/8 NE	C17	40
REICHHOLD CHEM	45 CORNELIUS ST	0 - 1/8 SSE	D19	47
CONRAIL PROPERTY	46 ALBERT AVE	0 - 1/8 SW	E20	48
REICHHOLD CHEMICAL	46 ALBERT AVE	0 - 1/8 SW	E23	55
CHEMICAL WASTE MANAGEMENT OF N	***100 LISTER AVENUE***	***0 - 1/8 NE***	***C24***	***57***
CHEMICAL WASTE MNGT.	***100 LISTER AVE***	***0 - 1/8 NE***	***C25***	***67***
CHEM WASTE MGT NJ	100 LISTER AVE	0 - 1/8 NE	C26	70
CHEMICAL WST MNGNT	100 LISTER AVE	0 - 1/8 NE	C27	71
CHEMICAL WASTE MGMT INC.	100 LISTER AVE	0 - 1/8 NE	C28	73
CHEMICAL WASTE MANEGMENT	100 LISTER AVE	0 - 1/8 NE	C29	74
CHEM WSTE MGT OF NJ INC	100 LISTER AVE	0 - 1/8 NE	C31	76
CHEMICAL WASTE MGT/SW CORNER	100 LISTER	0 - 1/8 NE	C32	78
CHEMICAL WASTE MGT OF NJ	***100 LISTER AVE***	***0 - 1/8 NE***	***C33***	***79***
CHEM WASTE MGMT OF NJ	100 LISTER AVE	0 - 1/8 NE	C34	83
CWM OF NEW JERSEY	100 LISTER AVE	0 - 1/8 NE	C36	102
CHEM WASTE MGT	100 LISTER AVE	0 - 1/8 NE	C37	103
CHEM.WST.MGT	***100 LISTER AVE***	***0 - 1/8 NE***	***C38***	***107***
CHEMICAL WST.MGMT OF N.J.	100 LISTER AVE	0 - 1/8 NE	C39	110
CHEMICAL WASTE MNGMNT	100 LISTER AVE	0 - 1/8 NE	C40	111

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Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CHEMICAL WASTE MANAGEMENT NJ	100 LISTER AVE	0 - 1/8 NE	C41	114
CHEMICAL WST MGT OF NJ	100 LISTER AVE	0 - 1/8 NE	C42	116
CHEM.WST.MGMT OF N.J.INC.	100 LISTER AVE	0 - 1/8 NE	C43	120
CHEMICAL WASTE MGT	***100 LISTER AVE***	***0 - 1/8 NE***	***C44***	***121***
CHEMICAL WSTE MGT OF NJ	100 LISTER AVE	0 - 1/8 NE	C46	134
IN FRONT	34 CORNEILA ST	0 - 1/8 SSE	D47	135
CORNER OF	***JOSEPH ST/LISTER AVE***	***0 - 1/8 ENE***	***F51***	***147***
B-LINE TRUCKING INC	64-66 JOSEPH ST	0 - 1/8 E	G53	161
UNK	60 JOSEPH ST	0 - 1/8 ESE	G54	162
RESIDENCE AT	60 JOSEPH ST	0 - 1/8 ESE	G55	163
BARRETT PAVING MATERIALS INC	***10 LISTER AVE***	***1/8 - 1/4 W***	***H56***	***165***
AREA OF	9 ALBERT ST	1/8 - 1/4 WSW	J64	175
LOMMA WAREHOUSE	***9 ALBERT AVE***	***1/8 - 1/4 WSW***	***J65***	***176***
IN FRONT OF	10 CORNELIA ST	1/8 - 1/4 SSE	K70	184
IN FRONT OF	10 CORNELIA ST	1/8 - 1/4 SSE	K71	185
SAN GIACOMOS	38 ESTHER ST	1/8 - 1/4 ESE	N76	192
SAN GIACONO TRUCKING CO	***38 ESTHER ST***	***1/8 - 1/4 ESE***	***N77***	***194***
AREA OF	38 ESTHER ST	1/8 - 1/4 ESE	N78	196
UNKNOWN FOOD COMPANY AT	***59 EUCLID AVE***	***1/8 - 1/4 SSE***	***O82***	***212***
REAR OF	15 1/2 ESTHER ST	1/8 - 1/4 SE	85	217
ASSOCIATED AUTO BODY & TRUCKS	***405 RAYMOND BLVD***	***1/4 - 1/2 S***	***100***	***250***
AUTO BODY SHOP	***90 CHAPEL ST***	***1/4 - 1/2 SSW***	***101***	***251***
GEORGE A MATHEWSON CO INC	***415 RAYMOND BLVD***	***1/4 - 1/2 S***	***T103***	***256***
LCSY AUTO GARAGE	429 RAYMOND BLVD	1/4 - 1/2 S	U107	263
UNKNOWN FACILITY	375 RAYMOND BLVD	1/4 - 1/2 SSE	108	268
NEWARK CARTING INC	***363-371 RAYMOND BLVD***	***1/4 - 1/2 SSE***	***V109***	***269***
JAMES J BRADY	***335-347 RAYMOND BLVD***	***1/4 - 1/2 SSE***	***Y116***	***282***
GRAVER CHEMICAL DIV OF THE GRA	***72 LOCKWOOD ST***	***1/4 - 1/2 SE***	***W118***	***289***
RAYMOND PETROLEUM	***303 RAYMOND BLVD***	***1/4 - 1/2 SE***	***Y120***	***297***
MAINTAINANCE YARD	475 RAYMOND BLVD.	1/4 - 1/2 SSW	X122	299
WELDED PRODUCTS COMPANY	330-336 RAYMOND BLVD	1/4 - 1/2 SE	Z127	304
POWER CONCRETE COMP INC	497 RAYMOND BLVD	1/4 - 1/2 SW	AB135	321
ON ROADWAY	RAYMOND / LOCKWOOD	1/4 - 1/2 SE	136	322
AREA OF	560 FERRY ST	1/4 - 1/2 S	AC138	325
IN FRONT OF	***573-589 FERRY ST***	***1/4 - 1/2 S***	***AD139***	***327***
FIBER FLEX INC.	574 FERRY ST	1/4 - 1/2 S	AD141	330
NEWARK MOTOR EXPORT	589 FERRY ST	1/4 - 1/2 S	144	332
NATIONAL FUEL OIL	525 RAYMOND BLVD	1/4 - 1/2 WSW	AE145	333
NATIONAL FUEL OIL INC	***525 RAYMOND BLVD***	***1/4 - 1/2 WSW***	***AE147***	***335***
CITY FIRE EQUIPMENT	***604 FERRY ST***	***1/4 - 1/2 SSE***	***AF149***	***338***
CITY FIRE EQUIPMENT CO	606 FERRY ST	1/4 - 1/2 SSE	AF150	341
ROADWAY	43 SCHALK ST	1/4 - 1/2 SSW	AG152	352
APARTMENT COMPLEX	625 FERRY ST	1/4 - 1/2 SSE	153	353
RESID	***648 FERRY ST***	***1/4 - 1/2 SSE***	***AH154***	***354***
RESIDENCE	648 FERRY ST	1/4 - 1/2 SSE	AH155	357
LUSO AMERICAN AUTO REPAIR	648 FERRY ST	1/4 - 1/2 SSE	AH156	363
LUSO AMERICAN AUTO REPAIR	650-652 FERRY ST	1/4 - 1/2 SSE	AH157	364
TRIANGEL TOWING	666 FERRY STREET	1/4 - 1/2 SE	AI159	371
TRIANGLE TOWING SERVICE INC	***666 FERRY ST***	***1/4 - 1/2 SE***	***AI160***	***376***
AT INTERSECTION OF	FOUNDRY ST / FERRY S	1/4 - 1/2 SE	AI162	381
BENNETT HEAT TREATING	***690 FERRY ST***	***1/4 - 1/2 SE***	***AJ163***	***383***
BENNETT HEAT TREAT &BRAZING	***690 FERRY STREET***	***1/4 - 1/2 SE***	***AJ164***	***385***
ENGINE CO #16/TRUCK CO 8	496 FERRY STREET	1/4 - 1/2 SSW	AO193	465
NAPORANO IRON & METAL	***FOOT HAWKINS ST***	***1/4 - 1/2 SSW***	***AO195***	***470***
MERCATO RESIDENCE	40 VINCENT ST	1/4 - 1/2 S	196	473
R. HORIZON PAPER	***38-60 BLANCHARD ST***	***1/4 - 1/2 ESE***	***AP199***	***480***

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
STEWART AND STEVENSON	***35 BLANCHARD ST***	***1/4 - 1/2 ESE***	***AP207***	***506***
ABLON FINISHES	***85 FOUNDRY ST***	***1/4 - 1/2 SSE***	***AQ216***	***529***
HURLEY FORGE INC	***70 MANUFACTURERS PL***	***1/4 - 1/2 S***	***AR218***	***532***
ON THE STREET	70 MANUFACTURERS PL	1/4 - 1/2 S	AR219	536
JACQUES C. SHIFF JR. INC	***195 MAIN ST***	***1/4 - 1/2 ESE***	***AP220***	***538***
DELEET MERCHANDISI	26 BLANCHARD ST	1/4 - 1/2 ESE	AS221	543
DELEET MECHANDISING CORP	26 BLANCHARD ST	1/4 - 1/2 ESE	AS222	544
DELETE MERCHANDISING	26 BLANCHARD ST	1/4 - 1/2 ESE	AS223	546
DELEET MERCHANDISING CORP	***26 BLANCHARD ST***	***1/4 - 1/2 ESE***	***AS224***	***547***
DELETE MECHANDISING	26 BLANCHARD ST	1/4 - 1/2 ESE	AS225	579
PRINTER SERVICES	26 BLANCHARD ST	1/4 - 1/2 ESE	AS226	581
DELEET MERCHANDISE	26 BLANCHARD ST	1/4 - 1/2 ESE	AS227	582
DELEET MERCHANDISING CORP	26 BLANCHARD ST	1/4 - 1/2 ESE	AS228	585

Lower Elevation	Address	Dist / Dir	Map ID	Page
HUG HOLDINGS	***99 CHAPEL ST***	***1/8 - 1/4 W***	***L73***	***187***
BENJAMIN MOORE CO	***134 LISTER AVE***	***1/8 - 1/4 ENE***	***Q87***	***223***
AREA OF BENJAMIN MOORE	135 LISTER AVE	1/8 - 1/4 ENE	Q90	235
BENJAMIN MOORE CO	***134 LISTER AVE***	***1/8 - 1/4 ENE***	***Q92***	***238***
DELISA PALLET CORP	***91-97 BLANCHARD ST***	***1/4 - 1/2 E***	***173***	***403***
FAIRMONT CHEMICAL CO	117 BLANCHARD ST	1/4 - 1/2 E	AL175	408
FAIRMONT CHEMICAL	***117 BLANCHARD ST***	***1/4 - 1/2 E***	***AL177***	***411***
FAIRMOUNT CHEMICAL CORP	***117 BLANCHARD ST***	***1/4 - 1/2 E***	***AL178***	***413***
FAIRMOUNT CHEMICAL CO INC	***117 BLANCHARD ST***	***1/4 - 1/2 E***	***AL179***	***416***
FAIRMONT CHEMICAL	***117 BLANCHARD STREET***	***1/4 - 1/2 E***	***AL180***	***424***
AREA OF	117 BLANCHARD ST	1/4 - 1/2 E	AL181	437
NORPAK CORP	***70 BLANCHARD ST***	***1/4 - 1/2 E***	***AM184***	***443***

NJ RELEASE: Hazardous material release. Initial notification information reported to the Dept. of Env. Protection's Action Line. The office has not conducted any investigations to determine it's validity. or accuracy.

A review of the NJ Release list, as provided by EDR, has revealed that there are 90 NJ Release sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SHERWIN WILLIAMS	***60 LISTER AVE***	***0 - 1/8 NNW***	***A3***	***13***
SHERWIN WILLIAMS PAINT	60 LISTER AVE	0 - 1/8 NNW	A4	18
CAVILER INTERNAT'L	***93 ALBERT AVE***	***0 - 1/8 SSE***	***B12***	***34***
IN AREA OF	80 LISTER AVE	0 - 1/8 NE	C16	39
DURALAC CHEMICAL CORP.	***84 LISTER AVE.***	***0 - 1/8 NE***	***C18***	***42***
CHEMICAL WASTE MANAGEMENT OF N	***100 LISTER AVENUE***	***0 - 1/8 NE***	***C24***	***57***
CHEMICAL WASTE MNGT.	***100 LISTER AVE***	***0 - 1/8 NE***	***C25***	***67***
CHEMICAL WASTE MGT OF NJ	***100 LISTER AVE***	***0 - 1/8 NE***	***C33***	***79***
CHEM.WST.MGT	***100 LISTER AVE***	***0 - 1/8 NE***	***C38***	***107***
CHEMICAL WASTE MGT	***100 LISTER AVE***	***0 - 1/8 NE***	***C44***	***121***
CHEMICAL WASTE MGT OF N.J.	100 LISTER AVE	0 - 1/8 NE	C45	132
AREA OF	122 ALBERT AVE	0 - 1/8 SE	49	141
AREA OF	66 JOSEPH ST	0 - 1/8 E	G50	146
CORNER OF	***JOSEPH ST/LISTER AVE***	***0 - 1/8 ENE***	***F51***	***147***
B-LINE TRUCKING INC	64-66 JOSEPH ST	0 - 1/8 E	G52	159
BARRETT PAVING MATERIALS INC	***10 LISTER AVE***	***1/8 - 1/4 W***	***H56***	***165***
Not reported	20 CORNELLA STREET	1/8 - 1/4 SSE	I60	171

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
Not reported	20 CORNELLA STREET	1/8 - 1/4 SSE	I61	172
Not reported	20 CORNELLA STREET	1/8 - 1/4 SSE	I62	173
LOMMA WAREHOUSE	***9 ALBERT AVE***	***1/8 - 1/4 WSW***	***J65***	***176***
AREA OF	9 ALBERT ST	1/8 - 1/4 WSW	J66	179
IN THE AREA OF	53 ESTHER ST	1/8 - 1/4 ESE	72	186
SAN GIACONO TRUCKING CO	***38 ESTHER ST***	***1/8 - 1/4 ESE***	***N77***	***194***
AREA OF FARMERS MARKET	CATHERINE ST/EUCLID AVE	1/8 - 1/4 SSE	O80	204
UNKNOWN FOOD COMPANY AT	***59 EUCLID AVE***	***1/8 - 1/4 SSE***	***O82***	***212***
AUTO BODY SHOP	***90 CHAPEL ST***	***1/4 - 1/2 SSW***	***101***	***251***
GEORGE A. MATHEWSON COMPANY	415 RAYMOND BLVD	1/4 - 1/2 S	T102	254
ELSY	429 RAYMOND BLVD	1/4 - 1/2 S	U104	259
ELSY	429 RAYMOND BLVD	1/4 - 1/2 S	U105	260
ELSY	429 RAYMOND BLVD	1/4 - 1/2 S	U106	262
LOADING DOCK	84 LOCKWOOD ST	1/4 - 1/2 ESE	W111	275
D L AUTO PARTS	349 RAYMOND BLVD	1/4 - 1/2 SSE	Y115	280
AREA OF	72 LOCKWOOD ST	1/4 - 1/2 SE	W117	288
IN AREA OF	RAYMOND BLVD / FOUNDRY	1/4 - 1/2 SE	Z129	306
AT INTERSECTION OF	FOUNDRY ST / RAYMOND	1/4 - 1/2 SE	Z130	310
STAR FINISHING INC	***41 CHAPEL ST***	***1/4 - 1/2 SSW***	***AA132***	***313***
AMER. REF-FUEL	290 RAYMOND BLVD.	1/4 - 1/2 SE	137	324
IN FRONT OF	***573-589 FERRY ST***	***1/4 - 1/2 S***	***AD139***	***327***
CITY FIRE EQUIPMENT	***604 FERRY ST***	***1/4 - 1/2 SSE***	***AF149***	***338***
RESID	***648 FERRY ST***	***1/4 - 1/2 SSE***	***AH154***	***354***
ON SIDE OF ROADWAY	666 FERRY ST	1/4 - 1/2 SE	AI161	380
BENNETT HEAT TREATING	***690 FERRY ST***	***1/4 - 1/2 SE***	***AJ163***	***383***
BENNETT HEAT TREAT &BRAZING	***690 FERRY STREET***	***1/4 - 1/2 SE***	***AJ164***	***385***
BENNETT HEAT TREATING & BRAZIN	690 FERRY ST	1/4 - 1/2 SE	AJ165	388
LIVE STOCK & POULTRY INC	270 RAYMOND BLVD	1/4 - 1/2 SE	166	390
AREA OF	27 SCHALK ST	1/4 - 1/2 SSW	AG167	392
AREA OF:	27 SCHALK ST	1/4 - 1/2 SSW	AG168	394
NJ TRANSIT BUS OPERATIONS INC	***703 FERRY ST - MAINT TR***	***1/4 - 1/2 SE***	***AJ169***	***395***
RONNSON METALS	37 MANUFACTURES PLAC	1/4 - 1/2 S	AK171	400
RONSON METALS	44 MANUFATORS PL	1/4 - 1/2 S	AK172	401
AREA OF	30 VINCENT ST	1/4 - 1/2 S	183	442
RONSON INC	55 MANUFACTURERS PL	1/4 - 1/2 S	AN188	454
NAPORANO IRON & METAL	***FOOT HAWKINS ST***	***1/4 - 1/2 SSW***	***AO195***	***470***
JERSEY MILLWORK COMPANY	***38 BLANCHARD STREET***	***1/4 - 1/2 ESE***	***AP198***	***474***
CALPINE INC	35 BLANCHARD ST	1/4 - 1/2 ESE	AP201	484
CALPINE NEWARK, INC.	***35 BLANCHARD ST***	***1/4 - 1/2 ESE***	***AP202***	***491***
O'BRIEN CO GEN	35 BLANCHARD ST	1/4 - 1/2 ESE	AP203	496
O'BRYON NEWARK CO-GEN	35 BLANCHARD ST.	1/4 - 1/2 ESE	AP204	498
O'BRYIAN COGEN PLT	35 BLANCHARD ST	1/4 - 1/2 ESE	AP205	499
NEWARK COGEN	35 BLANCHARD ST	1/4 - 1/2 ESE	AP206	501
STEWART AND STEVENSON	***35 BLANCHARD ST***	***1/4 - 1/2 ESE***	***AP207***	***506***
NEWARK CO-GEN	35 BLANCHARD ST	1/4 - 1/2 ESE	AP208	509
O'BRIEN ENERGY SYSTEM	35 BLANCHARD ST	1/4 - 1/2 ESE	AP209	515
NEWARK BOXBOARD COGEN	35 BLANCHARD ST	1/4 - 1/2 ESE	AP210	516
NEWARK BOX BOARD CO-GEN	35 BLANCHARD ST	1/4 - 1/2 ESE	AP211	519
RECYCLING STATION	35 BLANCHARD ST	1/4 - 1/2 ESE	AP212	520
NEWARK BOXBOARD CO-GEN	35 BLANCHARD ST	1/4 - 1/2 ESE	AP213	522
NEWARK BOXBOARD	35 BLANCHARD ST	1/4 - 1/2 ESE	AP215	527
ABLON FINISHES	***85 FOUNDRY ST***	***1/4 - 1/2 SSE***	***AQ216***	***529***
JACQUES C. SHIFF JR. INC	***195 MAIN ST***	***1/4 - 1/2 ESE***	***AP220***	***538***
DELEET MERCHANDISING CORP	***26 BLANCHARD ST***	***1/4 - 1/2 ESE***	***AS224***	***547***

Lower Elevation	Address	Dist / Dir	Map ID	Page
IN THE WATERWAY BY	134 LISTER AVE	1/8 - 1/4 ENE	Q86	218

Lower Elevation	Address	Dist / Dir	Map ID	Page
BENJAMIN MOORE CO	***134 LISTER AVE***	***1/8 - 1/4 ENE***	***Q87***	***223***
PROPERTY NORTH OF	134 LISTER AVE	1/8 - 1/4 ENE	Q88	229
BENJAMIN MOORE PAINT CO	134 LISTER AVE	1/8 - 1/4 ENE	Q89	234
AREA OF BENJAMIN MOORE PAINTS	134 LISTER	1/8 - 1/4 ENE	Q91	237
BENJAMIN MOORE CO	***134 LISTER AVE***	***1/8 - 1/4 ENE***	***Q92***	***238***
IN THE AREA OF	134 LISTER AVE	1/8 - 1/4 ENE	Q93	241
BENJAMIN MOORE PAINTS	134 LISTER AVE	1/8 - 1/4 ENE	Q94	242
HILTON-DAVIS	120 LISTER AVE	1/4 - 1/2 NE	S99	248
FAIRMONT CHEMICAL	117 BLACHARD ST	1/4 - 1/2 E	AL174	407
FAIRMONT CHEMICAL	***117 BLANCHARD ST***	***1/4 - 1/2 E***	***AL177***	***411***
FAIRMOUNT CHEMICAL CORP	***117 BLANCHARD ST***	***1/4 - 1/2 E***	***AL178***	***413***
FAIRMOUNT CHEMICAL CO INC	***117 BLANCHARD ST***	***1/4 - 1/2 E***	***AL179***	***416***
FAIRMONT CHEMICAL	***117 BLANCHARD STREET***	***1/4 - 1/2 E***	***AL180***	***424***
IN THE AREA OF	117 BLANCHARD ST	1/4 - 1/2 E	AL182	439
AMERICAN REF FUEL	66 BLANCHARD ST	1/4 - 1/2 E	AM189	456
ESSEX CO.RESOU. RECOV.FAC	66 BLANCHARD ST	1/4 - 1/2 E	AM190	459
AMERICAN REF-FUEL CONSTRUCTION	***66 BLANCHARD ST***	***1/4 - 1/2 E***	***AM191***	***460***
ESSEC CO RES REC	66 BLANCHARD ST	1/4 - 1/2 E	AM192	463

PROPRIETARY DATABASES

Former Manufactured Gas (Coal Gas) Sites:

The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative

A review of the Coal Gas list, as provided by EDR, has revealed that there is 1 Coal Gas site within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
ESSEX & HUDSON GAS CO.	FRANK E. ROGERS BLVD.	1/2 - 1 WNW	BE283	666

BROWNFIELDS DATABASES

NJ BROWNFIELDS: Brownfields are identified as formter or current commmercial or industrial use sites that are presently vacant or underutilized, on which there is suspected to have been a discharge of a contamination to the soil or groundwater at concentra tions greater than applicable cleanup criteria.

A review of the Brownfields list, as provided by EDR, and dated 04/01/2001 has revealed that there are 5 Brownfields sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
DURALAC CHEMICAL CORP.	***84 LISTER AVE.***	***0 - 1/8 NE***	***C18***	***42***
STANLEY TOOLS NEWARK	***140 CHAPEL ST***	***1/8 - 1/4 SW***	***M81***	***207***
NATIONAL FUEL OIL INCORPORATED	525 RAYMOND BLVD	1/4 - 1/2 WSW	AE146	335
BRILL EQUIP CO	***35 JAMES ST***	***1/4 - 1/2 S***	***AN187***	***451***
DELEET MERCHANDISING CORP	***26 BLANCHARD ST***	***1/4 - 1/2 ESE***	***AS224***	***547***

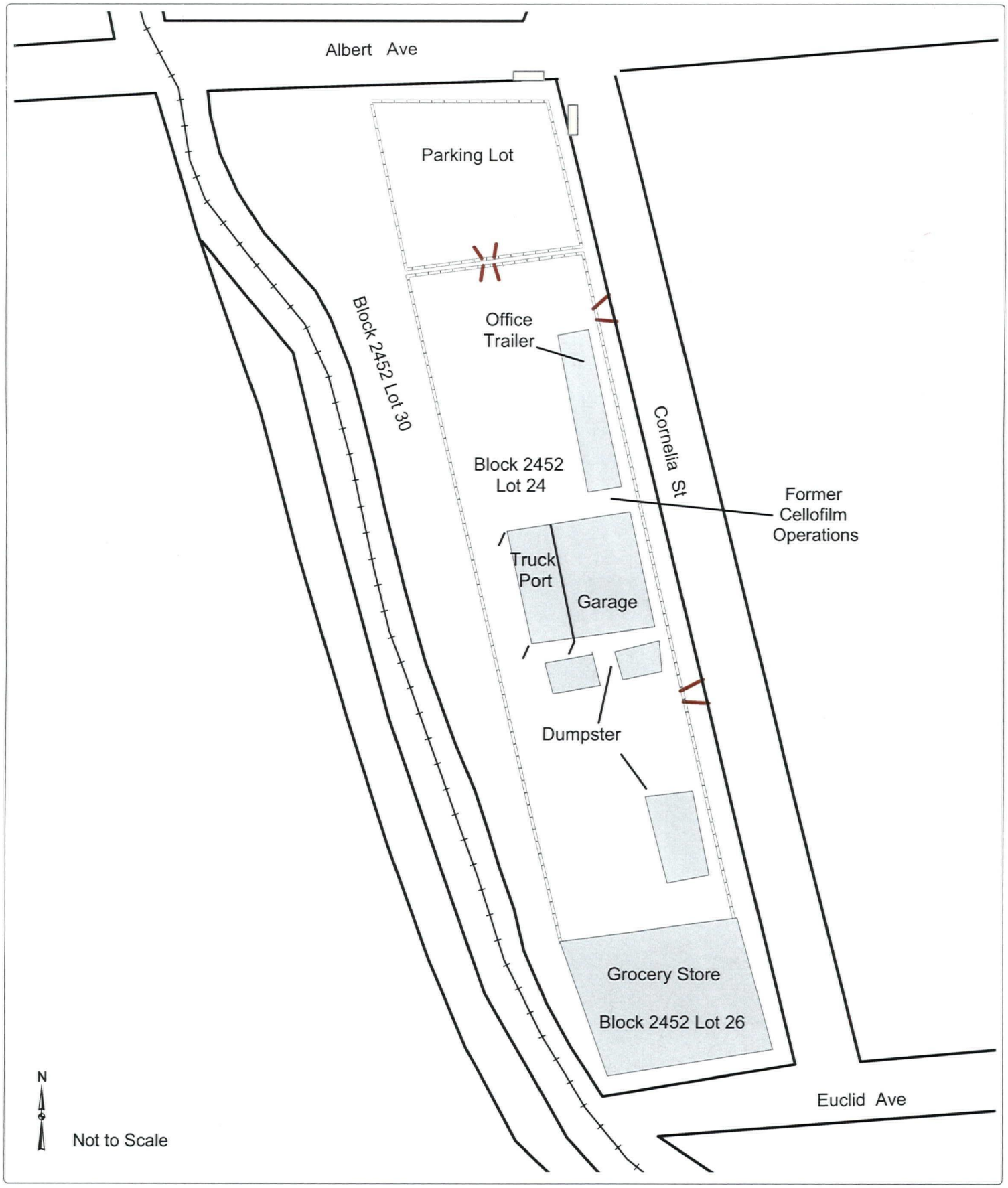
Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
FAIRFIELD INN & SUITES	SHWS
129 COMMERCIAL INDUSTRIAL PLAZA	SHWS
PORTUGESE BAKING COMPANY	SHWS
17 TO 17 ANN STREET	SHWS
168 TO 174 ROSEVILLE AVENUE	SHWS
WARD PROPERTY PARTNERSHIP	SHWS
ALLSTATE PAPER BOX COMPANY	SHWS
TRANSERVICE TRAILER LEASING	SHWS
335 TO 347 RAYMOND BOULEVARD	SHWS
GARDIAN FENCE COMPANY	SHWS, NJ Spills
NEWARK CITY BOARD OF ED MOTOR POOL	SHWS
MOBAY CHEMICAL CORPORATION	SHWS, INST CONTROL
MOBAY CHEMICAL CORPORATION	SHWS
GENERAL ELECTRIC NEWARK LAMP PLANT	SHWS
KOHLER PLANT	SHWS
47 TO 61 12TH AVENUE	SHWS
FEDERAL PACIFIC ELECTRICS COMPANY	SHWS
ST BENEDICTS CHRUCH	SHWS
NJ MARINE TERMINALS	SHWS, INST CONTROL
ELMWOOD AVENUE & ERIE PLACE	SHWS
FERRY STREET & JACKSON STREET	SHWS
NORRIS INDUSTRIES	SHWS, NJ Release
PSE&G COMPANY	SHWS
PORT AUTHORITY OF NY & NJ	SHWS, NJ Spills
ESSEX CITY COURT GARAGE	SHWS
NEW YORK AVENUE	SHWS, INST CONTROL
ENGINE COMPANY 15	SHWS
RECREATIONAL FACILITY	SHWS, NJ Spills, SWF/LF
9 REYNOLDS PL	SHWS
COAL ST GENERATING STATION	SHWS
BILL HENSLEY SERVICE STATION NEWAR	SHWS
381 10TH STREET NORTH	SHWS
ESSEX COUNTY YOUTH SERVICES	SHWS, NJ Release
NJ TURNPIKE EXIT 14 RAMP AREA	SHWS
NJ TURNPIKE EXPANSION	SHWS
NJ TURNPIKE AUTHORITY MAINTAINENCE	SHWS
NJ TRANSIT	NJ Spills, NJ Release, NJPDES
KEARNY GEN STATION	NJ Release, NJPDES
NEWARK DRIVE-IN	CERC-NFRAP
FOUNDRY STREET TRAILER	CERC-NFRAP
LOCKWOOD STREET	CERC-NFRAP
MUNICIPAL SWIMMING POOL	CERC-NFRAP
D & J TRUCKING SLF	SWF/LF
MERCER WRECKING/HILL MANOR	SWF/LF
GIB LABS	SWF/LF
NEWARK AIRP/TERM C GATE 100	LUST
ANHEUSER BUSH	NJ Spills, NJ Release, LUST
NJDOT STICKLE BRIDGE	RCRIS-SQG, FINDS
NJDOT BRIDGE BLASTING PAINTING	RCRIS-SQG, FINDS
NJDOT	RCRIS-SQG, FINDS
NJDOT 0703154	RCRIS-SQG, FINDS
NJDOT 0703155	RCRIS-SQG, FINDS
NJDOT 0703168	RCRIS-SQG, FINDS
NJDOT 0703170	RCRIS-SQG, FINDS
NJDOT 0703172	RCRIS-SQG, FINDS
NJDOT 0703174	RCRIS-SQG, FINDS
NJDOT 003176	RCRIS-SQG, FINDS
J L M MARKETING - CO MESSINGER WHS	RCRIS-SQG, FINDS
NJDOT 0703156	RCRIS-SQG, FINDS

LEE CONTRACTING & EQUIPMENT	RCRIS-LQG, FINDS
APT BLDG ACROSS FM MOBIL STN	NJ Spills, NJ Release
ON ROADWAY	NJ Spills, NJ Release
NEAR AIRPORT NORTH TERMINAL ON	NJ Spills, NJ Release
OGDEN AVIATION NEWARK AIRPORT	NJ Spills, NJ Release
CARGO LOGISCICS	NJ Spills, NJ Release
NEWARK AIRPPORT	NJ Spills, NJ Release
AREA OF	NJ Spills, NJ Release
RT 78 EB RAMP	NJ Spills, NJ Release
NEWARK AIRPORT OLD TERM. BLD.	NJ Spills, NJ Release
ON ROADWAY	NJ Spills, NJ Release
ON ROADWAY	NJ Spills, NJ Release
NJ TNPK	NJ Spills, NJ Release
IN AREA OF	NJ Spills, NJ Release
AREA OF SOUTH 16TH	NJ Spills, NJ Release
ON THE ROADWAY	NJ Spills, NJ Release
IN AREA OF	NJ Spills, NJ Release
RIVER BANK-NO OF BURRS CREEK	NJ Spills, NJ Release
ANN STREET SCHOOL	NJ Spills, NJ Release
611 MARTIN LUTHER BLVD	NJ Spills, NJ Release
NEWARK BAY CO GEN	NJ Spills, NJ Release
ADVARK AUTO WRECKERS(TEXAS AU)	NJ Spills, NJ Release
DISCOUNT AUTO SALVAGE	NJ Spills, NJ Release
AREA OF	NJ Spills, NJ Release
ROYCE CHEMICAL	NJ Spills, NJ Release
ON ROADWAY	NJ Spills, NJ Release
MM 105.9 SNOW	NJ Spills, NJ Release
NEWARK AIRPORT BLDG.#350	NJ Spills, NJ Release
AREA OFSOUTH 16TH ST	NJ Spills, NJ Release
ST MICHAELS HOSPITAL	NJ Spills, NJ Release
CONRAIL YARD	NJ Spills, NJ Release
INTERSECTION OF	NJ Spills, NJ Release
OAK ISLAND YARD	NJ Spills, NJ Release
BY TRACKS BY POLICE RANGE	NJ Spills, NJ Release
NEWARK INTERNATIONAL AIRPORT	NJ Spills, NJ Release
NEWARK AIRPORT GATE 5	NJ Spills, NJ Release
NEWARK AIRPORT	NJ Spills, NJ Release
STORM DRAIN (APPROX. 5 BLOCKS)	NJ Spills, NJ Release
AROK CHEMICAL	NJ Spills, NJ Release
CHEMICAL CO UNKNOWN NAME	NJ Spills, NJ Release
NH RAMP SOUTH TO	NJ Spills, NJ Release
ROADWAY-CORNER OF DICKERSON &	NJ Spills, NJ Release
NEW JERSEY TURNPIKE	NJ Spills, NJ Release
AREA OF S.T. RAMP TO	NJ Spills, NJ Release
INTERSECTION OF FABIAN PLACE	NJ Spills, NJ Release
CONTINENTAL ELECTRICS	NJ Spills, NJ Release
ON ROADWAY	NJ Spills, NJ Release
INTERCHANGE 15E-BOULEVARD INTC	NJ Spills, NJ Release
ON NJTP	NJ Spills, NJ Release
MILLER ST SCHOOL	NJ Spills, NJ Release
NJTPK BAYONNE EXTENSION	NJ Spills, NJ Release
NEWARK POST OFFICE	NJ Spills, NJ Release
CAPPY TRANSPORT INC.	NJ Spills, NJ Release
RESIDENCE	NJ Spills, NJ Release
INSIDE EXIT 15E/TOLL BOOTH	NJ Spills, NJ Release
ROADWAY	NJ Spills, NJ Release
BETWEEN X14+X15 ON	NJ Spills, NJ Release
NJSP BARRACKS	NJ Spills, NJ Release
BEHIND SYMPHONY HALL	NJ Spills, NJ Release
MANHOLE AT FRELINGHUYSEN AVE.	NJ Spills, NJ Release
FORMER HANOVIA PLATINUM WORKS	NJ Spills, NJ Release
PENN STATION	NJ Spills, NJ Release

IN ROADWAY RIVERSIDE AVE ON	NJ Spills, NJ Release
INTERSECTION OF MCCARTER HWY+	NJ Spills, NJ Release
BC/BS HORIZON BLDG	NJ Spills, NJ Release
PENN STATION	NJ Spills, NJ Release
PSE&G	NJ Spills, NJ Release
NEWARK AIRPORT TRM C	NJ Spills, NJ Release
ON ROADWAY BREWSTER RD	NJ Spills, NJ Release
BY RAILROAD TRACK AND NJTP	NJ Spills, NJ Release
OLD BLDG CORNER OF	NJ Spills, NJ Release
PORT NEWARK BERTH 51	NJ Spills, NJ Release
PORT AUTH.NY & NJ	NJ Spills, NJ Release
ON ROADWAY	NJ Spills, NJ Release
FEDERAL STORAGE WAREHOUSE	NJ Spills, NJ Release
EXIT 14	NJ Spills, NJ Release
ON ROADWAY OF RAMP WT	NJ Spills, NJ Release
ON SIDE OF ROAD: ACROSS TOYS	NJ Spills, NJ Release
INTC OF OLD LINCOLN HIWAY AND	NJ Spills, NJ Release
TOMKINS TIDE WATER TERMINAL	NJ Spills, NJ Release
AREA OF	NJ Release
ON ROADWAY	NJ Release
TERMINAL C	NJ Release
IN AREA OF EXIT 14 NJTP	NJ Release
NEWARK AIRLINES	NJ Release
ANHEUSER BUSH BREWERY	NJ Release
BY DELANCY ST RAMP	NJ Release
NEWARK AIR PORT/ BLDG #150	NJ Release
ROADWAY & STORM SEWER	NJ Release
ANHEUSER BUSH	NJ Release
POLASKY SKYWAY AREA	NJ Release
ANHEUSER BUSCH	NJ Release
ANHEUISER BUSCH	NJ Release
IFO ANHEISER BUSCH BREWERY	NJ Release
JO MAR AUTO BODY	NJ Release
AREA OF	NJ Release
BUDWISER BREWERY	NJ Release
ANHEUSER BUSCH	NJ Release
IN AREA OF	NJ Release
IN AREA	NJ Release
MP 106.2 RT 18 S/B	NJ Release
HANGER 55 MAIN TERMINAL	NJ Release
ANHEUSER BUSCH	NJ Release
IN AREA OF TURNPIKE	NJ Release
AREA OF	NJ Release
NEWARK BREWERY	NJ Release
ANHEUSSER-BUSCH	NJ Release
AREA OF	NJ Release
AREA OF	NJ Release
AREA OF	NJ Release
AREA OF	NJ Release
IN AREA OF	NJ Release
AREA OF	NJ Release
NEAR AIR PORT	NJ Release
REAR OF TULLOS TRUCK STOP	NJ Release

Reference 27



LEGEND: Railroad, Storm Drains, Fence, Gate

TITLE: Site Map
Cellofilm Corporation
Newark, New Jersey

PROJECT: 20103.001.001.1078.00

CLIENT NAME: EPA

DATE: 10/4/04

FIGURE #: 2