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Executive Summary

*Eastern New Jersey, New York City and southern Long Island beaches experienced only **one** incident resulting in short temporary beach closings due to floatable debris in 2000, despite above average rainfall. The interagency implementation of the Floatables Action Plan ("FAP") was a major contributor to maintaining this improved beach status.*

The FAP is designed to accomplish the following objectives:

- *Minimization of the amount of floatable debris escaping the Harbor Complex;*

- *Maintaining an effective communication network to coordinate floatable debris removal activities and to respond to the spotting of slicks;*

- *Ensuring timely notification of beach operators of potential wash-ups of floatable debris; and*

- *Minimization of beach closures due to floatable debris.*

The FAP has proven to be very successful in minimizing the escape of floatable debris from the Harbor Complex. The principal means of collecting floating debris slicks has been through the utilization of USACOE skimmer vessels. These vessels collected 1271 tons of floatable debris on scheduled "2000 floatables days"(days of and the following two days of new and full moon), and an estimated 5399 tons of floatable debris throughout fiscal year 2000.

The New York City Department of Environmental Protection ("NYCDEP") has supplemented the work of the USACOE with an open water skimmer vessel of its own as well as a booming and skimming program at major City CSO outfall locations. These measures collected 320 tons and 614 cubic yards respectively. NYCDEP also conducted several beach-specific clean-up programs. These projects utilized community volunteers to collect 160 cubic yards of debris in 2000.

The Passaic Valley Sewerage Commissioners (PVSC) also supplemented the USACOE open water skimming operations by operating a skimmer vessel in the Passaic River and Newark Bay, collecting a total of 68 tons of floatable debris in 2000.

PVSC's shoreline debris removal program collected an additional 203 tons of debris in 2000.

New Jersey's Clean Shores Program, which utilizes prison inmates to remove shoreline debris, collected 2563 tons in 2000 and the State's Adopt-A-Beach program collected a total of 64,696 beach litter items.

The maintaining of an effective communication network has remained a key element of the implementation of the FAP. EPA has remained the hub of the communication network, with its Floatables Coordinator as the link with the USACOE, the United States Coast Guard ("USCG"), the NYCDEP, the NJDEP, the NYSDEC, the NYCDOS, the National Oceanic and Atmospheric Administration ("NOAA") and the public. Appropriate actions include the reporting of the slick information to the USACOE or the USCG (for oil slicks), based on EPA helicopter flyover reports.

The States of New York and New Jersey continue to work with Harbor dischargers to control floatable debris in the long-term. New Jersey is seeking to have floatables control measures sufficient to meet the State-wide permit mandated 0.5 inch floatable size standard, implemented by 2003. New York continues to work with New York City to see the implementation of long-term measures to build upon and perhaps replace existing floatable debris control measures being carried out by the City.

I. Summary and Statement of Purpose

Eastern New Jersey, New York City and southern Long Island beaches experienced one incident resulting in beach closings due to floatable debris in 2000. The interagency implementation of the Floatables Action Plan ("FAP") was a major contributor to maintaining this improved beach status.

Formal United States Environmental Protection Agency ("EPA") Region II assessment reports of the FAP were prepared for the following time frames:

a) 1989
b) 1990
c) 1991
d) 1992
e) 1993 - 1994
f) 1995 - 1997
g) 1998
h) 1999

This assessment report has been prepared for 2000 and will assess the effectiveness of the short-term FAP in accomplishing the following objectives:

- Minimization of the amount of floatable debris escaping the Harbor Complex;

- Maintaining an effective communication network to coordinate floatable debris removal activities and to respond to the spotting of slicks;

- Ensuring timely notification of beach operators of potential wash-ups of floatable debris; and

- Minimization of beach closures due to floatable debris.

This assessment report will also discuss the required long-term implementation measures to permanently address floatable debris and provide the current status of long-term implementation measures, providing a clear understanding of what is still needed to effectively control floatable debris in the Harbor Complex.

II. Background

a) What is floatable debris?
Floatable debris is waterborne waste material that is buoyant. Examples include:

- wood
- beach litter
- aquatic vegetation
- street litter: e.g., cans, bottles, Styrofoam cups, plastics, straws, and paper products
- sewage-related wastes: e.g., condoms, sanitary napkins, tampon applicators, diaper liners, grease balls, tar balls, and fecal material
- fishing gear: e.g., nets, floats, lines and traps
- medical wastes: e.g., hypodermic needles, syringes, bandages, red bags and enema bottles

b) What are the sources that generate floatable debris?
The principal sources of floatable debris to the New York / New Jersey Harbor ("Harbor") and the New York Bight are the following:

- Combined Sewer Overflow ("CSO") Discharges: There are approximately 737 combined sewer overflow (CSO) points discharging to the open waters of the NY/NJ Harbor or to its tributaries:

460 from New York City
29 from Westchester County
248 from New Jersey
---

737 in total

There are no CSO points discharging to the Bight or to the Back Bays.

- Storm Water Discharges: New York City, while predominantly a combined sewered City, has over 350 outfalls from its municipal separate sewer system.

  Hundreds of more storm sewer outfalls in New York and New Jersey impact the Harbor Complex from industrial activity, construction activity and highway drainage.

- Non-point source discharges: including littering, landfill practices, and marine transfer practices;

- Decaying shoreline structures and sunken vessels; and

- Vessel discharges.

c) What are the impacts of floatable debris?
Discharges of floatable debris cause beach closures, have an adverse impact on recreational and commercial boating and cause harm to coastal marine species.

Large amounts of marine debris washed up on southern Long Island ocean beaches and on New Jersey ocean beaches in 1987 and 1988. In 1987, floatable washups were responsible for the closing of 25 miles of New Jersey beaches in May and 50 miles of New Jersey beaches in August. In 1988, floatable washups were responsible for the closing of 60 miles of New York beaches.

These beach closings in New Jersey and New York lasted for varying time periods from several hours to several days and had significant economic and social impacts. The State University of New York Waste Management Institute estimated an economic loss of between $900 million and $4 billion in New Jersey and between $950 million and $2 billion in New York in the 1987 - 1988 time frame.

Medical syringes, while only a tiny portion of the washups, caused a great deal of concern, prompting the passage of the Medical Waste Tracking Act by Congress in 1988.

Floatable debris, particularly driftwood, poses a hazard to shipping and recreational boating in the Harbor / Bight. The United States Army Corps of Engineers ("USACOE") conducts two programs to address floatable debris: 1) collection of debris already floating and 2) dismantling deteriorating structures before they become drift. Drift materials include timbers, pilings, plastics, rubber tires, fiberglass boats, Styrofoam, rafts, floating drums, docks, sheds, and other shore structures.

Birds, mammals and sea turtles are found seasonally throughout the Bight and portions of the Harbor. These species are vulnerable to entrapment and entanglement in plastic waste including six pack rings, fishing line, and nets. Turtles and mammals (seals and whales) are vulnerable to ingestion of plastic items, such as bags, that are mistaken for squid, jellyfish, or other prey. This ingestion often leads to suffocation or intestinal blockage and death.

III. How effective has the FAP been in minimizing the escape of floatable debris from the Harbor Complex?

The FAP has proven to be very successful in minimizing the escape of floatable debris from the Harbor Complex. The principal means of collecting floating debris slicks has been through the utilization of USACOE skimmer vessels. The New York City Department of Environmental Protection ("NYCDEP") has supplemented the work of the USACOE with an open water skimmer vessel of its own as well as a booming and skimming program at major City CSO outfall locations. Other means have also been utilized to minimize the escape of floating debris from the Harbor Complex. The following summary of these various measures is for 2000 but also includes historical data, where appropriate, for the purpose of comparison.

a) What are the vessels that the USACOE uses to support FAP implementation?

The USACOE uses three vessels to support FAP implementation in the Harbor and these vessels are described in the following table:

USACOE Skimmer Vessel Information

Name of Vessel	Hayward	Driftmaster	Gelberman
Year Built	1974	1948	1980
Length (feet)	124	99	85
Weight (tons)	390.4	230	190.17
Crane Capacity (tons)	20	12.5	4.5

The Hayward is used to remove debris and obstructions from high use navigational channels to provide clear and safe channels for general navigation and to ensure that life and property are protected. The vessels's primary function is the collection of floating debris but more specifically the snagging of larger logs, wreckage, barges, and lifting obstructions from the waterway. The vessel tows a catamaran barge with a drift net to pick up flotsam and jetsam.

The Driftmaster is used to remove debris and obstructions from high use navigational channels to provide clear and safe channels for general navigation and to ensure that life and property are protected. The vessel's unique catamaran hull design enables the vessel to trap floating debris between its hulls before it is collected in nets. Pieces too large are towed alongside. The vessel also lifts wreckage, sections of piers and sunken derelict vessels and barges which are hazards to navigation.

The Gelberman is used to remove debris and obstructions from high use navigation projects and hard to maneuver locations. The vessel's primary function is to collect floating debris from channels and more confined areas. The vessel pulls a catamaran barge with a drift net to collect flotsam and jetsam.

These three USACOE vessels, the Hayward, the Driftmaster and the Gelberman, have been deployed in the Harbor to collect floating slicks since the initiation of the FAP in 1989.

b) <u>How much floatable debris has the USACOE collected in support of the FAP?</u>

The Water Resources Development Act ("WRDA") of 1974 was modified by WRDA 90 Section 102 (V) (Public Law 99-662) to authorize the collection of floatable debris whenever the USACOE is collecting and removing debris which is an obstruction to navigation. The USACOE estimates that 90 per cent (by volume) of its collection total consists of wood debris. Tires, plastic waste, cardboard, seaweed, sewage-related materials and street runoff-related

materials constitute the remaining 10 per cent (by volume).

The USACOE drift removal vessels report collection totals in different ways. The following table indicates the total tons of floatable debris collected by the three USACOE vessels on scheduled "floatable days" for the listed calendar years. A scheduled "floatable day" is the day of and the two days following both new and full moons (Note: a listing of the USACOE scheduled "floatable days" for calendar year 2000 is attached to this report). USACOE skimmer vessels are deployed to strategic locations on these days, to locations where floatable debris historically congregates after becoming resuspended upon higher tides. For these scheduled "floatable days", the USACOE weighs its nets and reports the drift collection totals in terms of tons collected.

USACOE Skimmer Vessel
Collection Totals
For Scheduled Floatable Days

Year	Tons of Debris Collected
1989	545
1990	795
1991	701
1992	958
1993	1088
1994	1298
1995	829
1996	1407
1997	768
1998	1023
1999	1165
2000	1271

The above table only represents the drift collection performed by the USACOE on scheduled "floatable days." The USACOE reports its annual (on a fiscal year (October - September) basis) drift collection total in terms of cubic feet. The following table lists these fiscal year totals, converts them to cubic yards (for purposes of comparing with the NYCDEP skimmer vessel collection totals), and, based on discussions with the USACOE estimates a total tonnage value based on an approximate conversion factor of 100 cubic feet per ton:

Fiscal Year USACOE Total Skimmer Vessel Collection Totals

Fiscal Year	Total Drift Collection (Cubic Feet)	Total Drift Collection (Cubic Yards)	Estimated Total Drift Collection (Tons)
1988	537,353	19,902	5,374
1989	571,645	21,172	5,716
1990	537,770	19,917	5,378
1991	544,350	20,161	5,444
1992	548,970	20,332	5,490
1993	539,355	19,976	5,394
1994	442,615	16,393	4,426
1995	552,840	20,476	5,528
1996	592,450	21,943	5,925
1997	493,400	18,274	4,934
1998	558,900	20,700	5,589
1999	560,575	20,762	5,606
2000	539,930	19,997	5,399

The accuracy of this graph hinges on the conversion factor used of "100 cubic feet per ton." This may very well be a conservative estimate (in other words, the collection total in tons is NOT overstated) and the following should be considered:

1. If a parcel of water measuring 100 cubic feet were collected by the USACOE skimmer vessels, it would weigh (using 0.01602 cubic feet per pound of water) 3.12 tons. This may be considered as the upper limit of any collected parcel of material measuring 100 cubic feet.

2. Since the USACOE skimmer vessels are drift collection vessels, items are collected which are buoyant in water. In general then, any parcel of collected material measuring 100 cubic feet will weigh less than 3.12 tons.

3. The USACOE already routinely estimates that 90% (by volume) of its drift collection is comprised of wood. Although the wood is waterlogged and heavy, each 100 cubic feet of wood will weigh less than 3.12 tons since it was buoyant.

4. When floatable debris is collected by the USACOE skimmer vessels, the total volume includes significant "void spaces" which do not add weight. This further adds to the fact that parcels of material measuring 100 cubic feet will weigh less than 3.12 tons.

The use of the conversion factor of 100 cubic feet per ton is therefore a conservative one and is derived from the actual weighing of nets on scheduled "floatable days."

c) How has the NYCDEP supplemented the USACOE in removing floatable debris from the Harbor?

The 1992 CSO Abatement Order on Consent between the NYCDEP and the New York State Department of Environmental Conservation ("NYSDEC") required the following:

- NYCDEP was to implement a short-term booming and skimming program to address floatables pollution from approximately 50% of the City's combined sewer service area. This interim program was principally focused on the tributaries on which retention tanks will be built under the long-term CSO abatement program that the City is implementing, and will continue until that point in time. The NYCDEP was to collect and remove substantially all waterborne floatables in Bergen Basin, Thurston Basin, Paerdegat Basin, Hendrix Creek, Newtown Creek, Gowanus Canal, Coney Island Creek, and the Upper East River tributaries consisting of the Bronx River, Flushing Creek, Westchester Creek, and the Hutchinson River (if practicable). Additionally, the NYCDEP was to collect and remove substantially all waterborne floatables from 10 CSO outfalls in beach-sensitive open water areas. To accomplish this booming and skimming program, the NYCDEP was to purchase and utilize four small skimmer vessels.

The NYCDEP was also to utilize a large open water skimmer vessel (named the Cormorant), patterned after the USACOE Driftmaster skimming vessel, to patrol the waters of the Harbor. The following tables summarize the NYCDEP skimming vessels and the status of the booming and skimming locations.

NYCDEP Skimmer Vessel Information

Name	Where Used	Length (feet)	Capacity
SV Piping Plover	Tributaries	50	3,000 -12,000 lbs of wet material
SV Ibis	Tributaries	50	3,000 -12,000 lbs of wet material
SV Heron	Tributaries	50	3,000 -12,000 lbs of wet material
SV Egret	Tributaries	50	3,000 -12,000 lbs of wet material
SV Cormorant	Open Waters	100	2 nets; 1,000 cubic feet per net; 2,000 cubic feet in total; up to 10 tons of wet material per net

NYCDEP Skimming and Booming Program Locations

Booming / Skimming Site	Approximate Drainage Area (acres)	Permanent Installation Date
Westchester Creek	2039	9/96
Clason Point *	333	10/96
Bronx River	1799	7/96
Hunts Point	761	4/96
Flushing Creek 1 (CSO4)	6790	11/96
Flushing Creek 2 (CSO7) *	768	11/96
Flushing Bay 1 (CSO 2)	1225	4/96
Flushing Bay 2 (CSO3)	3053	4/96
Bowery Bay	2830	4/96
Maspeth Creek	1028	9/96
East Branch (East River)	1338	9/96
English Kills	2197	9/96
Bushwick Inlet *	771	1/97
Wallabout Channel 1	1258	9/96
Wallabout Channel 2	1093	9/96
Gowanus Canal	667	---
Owls Head *	1253	5/96
Coney Island Creek	2751	6/96
Paerdegat Basin	5787	6/93
Fresh Creek *	2110	11/88
Hendrix Canal	520	6/93
Bergen Basin	13400	6/94
Thurston Basin	4803	6/94

* Sites marked with an asterisk indicate netting installations rather than booming. The total approximate drainage area impacted by the skimming and booming (and netting) program is 58,574 acres, which represents over 50 per cent of the City's combined sewer drainage area.

The NYCDEP maintains a contract such that a contractor manages

the collected floatable debris under the skim and boom program. Materials are trucked out of state.

d) How much floating debris has the NYCDEP SV Cormorant collected?

NYCDEP SV Cormorant collection data dates back to May 1994
The 2000 data is presented in the following table:

2000 NYCDEP SV Cormorant Collection Totals

(Values are Tons of Material Off-Loaded from Vessel)

Month	Wood	Plastic	Metal	Rubber	Glass	Trash	Other	Total
January	13.6	0.9	0.3	0.5	0	1.7	0	17
February	10.2	0.6	0.2	0.6	0	0.4	0	12
March	44.3	2.9	1.2	1.6	0	4.5	0	54.5
April	25.8	1.6	0.6	0.6	0	1.4	0	30
May	54.3	4.7	1	1.7	0	7.3	0	69
June	25.5	1.6	0.6	0.9	0	2.4	0	31
July	14.4	1.1	0.2	0.5	0	2.4	0	18.6
August	25.7	1.5	0.7	0.9	0	2.2	0	31
September	10.4	0.4	0.3	0.6	0	1.3	0	13
October	21	0.9	0.3	1.1	0	2.7	0	26
November	7.6	0.5	0.1	0.3	0	0.4	0	8.9
December	7.7	0.7	0.1	0.2	0	0.3	0	9
Annual Total	**260.5**	**17.4**	**5.6**	**9.5**	**0**	**27**	**0**	**320**

Above tonnages are based on a full net of 12 tons. The percentage of a net's capacity is determined by a weight sensing device that was installed in November 1998. This device provides a digital read-out.

Example for Wood:

Net is measured to be 90% full
Weight of material in net is 10.8 tons (0.9 x 12 tons)
Wood is estimated to be 90% of load
Weight of wood in net is 9.7 tons (0.9 x 10.8 tons)

e) How much floating debris has the NYCDEP Booming and Skimming Program collected? The NYCDEP booming and skimming program dates back to 1995. The 2000 data is presented in the following table.

NYC Boom and Skim Program Collection Totals for 2000 (Cubic Yards)

Month	Zone I [Jamaica Bay]	Zone II / III [East River and Newtown Creek]	Zone IV [Upper East River and Flushing / Bowery Bays]	Monthly Total
January	0	11	12	23
February	9.5	6.5	16	32
March	27	14	33	74
April	6	10	24	40
May	6.5	0	27	33.5
June	24	6	41	71
July	11	17	22	50
August	37	20	52	109
September	11	21	30	62
October	0	9.25	26	35.25
November	6	6.5	48	60.5
December	0	3.5	20	23.5
Annual Zone Total	138	124.75	351	613.75

Note: Due to such factors as frozen tributaries, unfavorable (northeasterly) winds and low rainfall (with low floatable debris discharged), there are months in which no boomed floatable debris is collected in the designated zones.

The NYCDEP is planning on replacing each of its four smaller tributary skimmer boats in 2001 and is investigating the possibility of adding one or more intermediate sized skimmer boats to skim the inter-pier areas on the Hudson River, East River and in Brooklyn in support of various New York City waterfront development projects.

f) How much debris has the NYCDEP Special Project Clean-up Program collected? In 1998, the NYCDEP initiated a beach clean-up program in the Gerritsen Beach area of Brooklyn, NY. This project, now termed NYCDEP's Special Project program, was expanded in 1999 to also include Fort Hamilton High School and Coney Island Creek Beach components. These new components served to remove debris collected in the vicinity of the Verrazano Bridge. This program, in some ways analogous to the NJDEP Clean Shores Program, uses community volunteers to remove debris on beaches and shorelines. The NYCDEP provides dumpsters for debris placement and, because of the closure of the Fresh Kills landfill

(officially closed in early 2001, but NYCDEP began implementing measures to compensate for the closure in 2000), is utilizing its water pollution control plant residuals management contracts to have this collected debris trucked out of state. The debris removed by this program is depicted on the following table:

NYCDEP's Special Project Clean-up Program
(1998 - Present)

Year	Cubic Yards Collected
1998	280
1999	680
2000	160

Additionally, the NYCDEP conducted a shoreline dumping prevention program since 1998. NYCDEP personnel involved with ongoing monitoring activities survey the shoreline of the City for evidence of recent illegal disposal activities. Findings are reported to the New York City Department of Sanitation Environmental Police for enforcement follow-up.

g) How has the NYCDEP's Enhanced Beach Protection Program minimized floatables being discharged to beach sensitive areas?

The NYCDEP's Bureau of Wastewater Pollution Control is responsible for the operation of New York City's collection facilities which convey the flow of sanitary and combined sewage to the fourteen Water Pollution Control Plants (WPCPs). A failure within the conveyance system during dry weather can cause the spill of sewage with floatables to the New York Harbor resulting in dry weather bypasses. As a response to the series of failures in June of 1997, the NYCDEP instituted the Enhanced Beach Protection Program (EBPP) on July 2, 1997, to minimize the chance of additional beach closures due to failure within the collection facilities through a program of increased surveillance and preventive maintenance procedures for critical pumping stations and regulators. The program was found to be successful and in 1998 it was implemented again and became a yearly program to be conducted by the NYCDEP.

The goals for the EBPP include the prevention of any beach closing from failure of collections facilities and an average bypass response time of 8 hours. The program includes all the original beach sensitive locations and additional sites which the Bureau determined to require high maintenance. Bureau personnel increased the frequency and locations of monitoring through the

use of NYCDEP's Harbor Marine Programs. The EBPP for 1999 marked the first year that the NYCDEP could relay on its pump station telemetry system to monitor most pump stations.

h) What role has the New Jersey Department of Environmental Protection ("NJDEP") played in minimizing floatable debris from escaping the Harbor complex?

Clean Shores Program

Beginning in 1989, the NJDEP began a program called "Operation Clean Shores", designed to collect shoreline floatable debris before it became resuspended due to tidal influences. This program has used New Jersey inmates to collect floatable debris, comprised mainly of landed drift wood, on non-recreational shorelines in order to prevent floatable debris from being refloated during extreme high tides and washing up on recreational beaches, becoming hazards to navigation and impacting marine life. The program, now called the "Clean Shores Program", is conducted throughout the State of New Jersey, in the Hudson, Raritan and Delaware estuaries and barrier island bays. In 1993, the Clean Shores Program began to be implemented on a year-round basis whereas formerly it was only implemented during the bathing season. The Program is funded by the sale of Shore Protection license plates. Historical collection totals and collection totals for 2000 for this highly effective program are presented in the following table:

NJDEP's Clean Shores Program Data

Year	New Jersey Shore Miles Addressed	Tons of Floatable Debris Collected
1989	24	3000
1990	48	4800
1991	74	4900
1992	85	5800
1993	71	5750
1994	62	3700
1995	80	2050
1996	103	2650
1997	146	2953
1998	138	2400
1999	182.4	2400
2000	114.9	2563

Adopt A Beach Program

The State of New Jersey enacted a law on January 7, 1993 which authorized the NJDEP to administer an "Adopt A Beach" program, fostering volunteer stewardship of coastal beaches. NJDEP is required to sponsor two statewide beach clean-ups each year. Volunteers select or "adopt" a beach for these clean-ups. Historical data and data for 2000 are presented in the following table.

NJDEP's Adopt A Beach Program Data

Year	Number of Debris Items Collected
1993	36,122
1994	69,221
1995	93,016
1996	78,282
1997	84,433
1998	120,307
1999	59,247
2000	64,696

Results of the Adopt A Beach Program are forwarded to the Center for Marine Conservation ("CMC") in order to be included in the CMC's national and international marine debris database.

i) How much beach debris has been collected in New York State as a result of the Center for Marine Conservation ("CMC") International clean-up days?

Annually, the Center for Marine Conservation ("CMC") sponsors an International beach clean-up day in September. As mentioned above, the New Jersey Adopt-A-Beach program information is forwarded to the CMC for inclusion into the international data base. The following information is the State of New York. Data is for the following eight counties: **Suffolk, Nassau, Queens, Kings, Richmond, Manhattan, Bronx, and Westchester:**

CMC Clean-up Results for 8 New York Counties (1994 - Present)

Year	Beach Miles Cleaned	Pounds of Debris
1994	82.10	42,622
1995	98.75	46,001
1996	108.60	83,533
1997	168.97	95,201
1998	194.00	145,705
1999	162.4	153,507
2000	233.2	202,553

While some of this collected debris (i.e., that debris that is collected in eastern Westchester County and the north shore of Long Island) probably cannot affect New Jersey Beaches or the south shore beaches of Long Island, it is presented for general trend analysis.

j) What has the Passaic Valley Sewerage Commissioners ("PVSC") done to minimize floatable debris in the Harbor Complex?

In 1999, PVSC obtained a skimmer vessel, virtually identical to the NYCDEP skimmer boats used in NYCDEP's boom and skim program, to be used on the Passaic River and in Newark Bay. This skimmer vessel is described in the table below:

Name	Where Used	Length (feet)	Capacity
SV The Newark Bay	Passaic River and Newark Bay	50	12,000 lbs of wet material or 700 cubic feet

Under a FY'99 Federal Appropriations Act Grant, PVSC is constructing a docking facility at the PVSC plant in Newark, New Jersey for the skimmer vessel. This skimmer vessel initiated its operation (two pictures are included as attachments to this Report) in 2000 and data for 2000 is presented in the following table:

PVSC Skimmer Vessel Collection Data (2000)

Year	Tons of Floatable Debris Collected
2000	68

PVSC has established a program to aid in removing trash along the riverbanks of the Passaic River. The program provides coordination and support to municipalities, counties, citizens, service groups, and local businesses to conduct shoreline clean-ups along the river and in their communities. This program is entitled the Passaic River/Newark Bay Restoration Program: Shoreline Clean-up Element.

PVSC has been supporting voluntary efforts to remove debris along the shoreline of the Passaic River since 1998, and has assisted in 121 cleanups. Gloves, trash bags, trash disposal, and other supplies as requested are arranged for and provided by PVSC to the volunteers. In addition to the sponsorship of voluntary efforts, PVSC has implemented an extensive clean-up of the river's shoreline by creating a River Restoration Department, consisting of 6 full time employees dedicated to the removal of trash and debris from the Passaic River and Newark Bay. Additionally, during the summer months PVSC's part time employees removed trash on a daily basis in

urban parks along the River. Collection data for 2000 is presented in the following table:

Passaic River/Newark Bay Restoration Program:
Shoreline Clean-up Element

Year	Tons of Floatable Debris Collected
1998	85.6
1999	88.7
2000	203

k) What has New Rochelle done to minimize floatable debris in the Harbor Complex?

New Rochelle is a city of 67,000 residents with ten miles of shoreline. As the city collection system is a separate sewer system, floatable debris is discharged to the local waterways from storm sewer outfalls. In 1998 the City, under a NYSDEC 50-50 matching grant installed a $58,000 "stream floatable debris collection device" at a major storm sewer outfall which empties into Echo Bay and Long island Sound. This boom-type (described in more detail in an attachment to this report) device has a capacity of approximately 6 cubic yards. When full, the weight of the basket and debris can be as much as 1,500 pounds. The following table summarizes collection totals for 2000:

New Rochelle Boom Collection Totals: 2000
(Values are in Cubic Feet)

Month	Wood	Paper	Glass	Metal	Plastic	Organics	Total
January	4	0	0	0	3	25	32
February	0	0	18	0	25	29	72
March	3	3	0	0	4	14	24
April	24	6	8	2	18	14	72
May	21	7	6	0	11	25	70
June	10	8	2	0	4	16	40
July	5	1	1	2	6	14	29
August	12	5	3	0	6	14	40
September	0	0	0	0	0	2	2
October	3	0	0	0	0	4	7
November	0	5	0	0	5	27	37
December	27	0	0	0	1	30	58
TOTAL	**109**	**35**	**38**	**4**	**83**	**214**	**483**

l) What role has the New York City Department of Sanitation("NYCDOS") performed in minimizing floatable debris in the Harbor Complex?

Since the inception of the FAP, the NYCDOS has provided a barge on the Hudson River for the dumping of collected floatable debris from the USACOE on designated "floatables days" and from the NYCDEP's "Cormorant" vessel. The NYCDOS then disposed of the dumped floatable debris at the Fresh Kills landfill.

Due to the closing of the Fresh Kills landfill, the NYCDOS notified the NYCDEP and the USACOE in mid-2000 that it would not be able to provide a barge on the Hudson River for the dumping of collected floatable debris beyond 2000. EPA met with the NYCDOS, NYCDEP and the NYCDEP in June 2000 to discuss the various options given the unavailability of the barge. These discussions produced the following plan:

a) The USACOE will use its own barge at Caven Point to dump its floatable debris;

b) The NYCDEP instituted a plan which includes an interim and long-term component:

Interim Plan: NYCDEP will pay the USACOE to allow it to dump its collected floatable debris from the "Cormorant" vessel into the USACOE barge at Caven Point.

Long-term Plan: NYCDEP will pay a contractor to provide a barge, maintain the barge, dock the barge and empty the barge into which collected floatable debris from the "Cormorant" vessel will be dumped. The NYCDEP expects that this long-term option will be initiated in 2001.

IV. How effective has the FAP been in maintaining a communication network to coordinate floatable debris removal activities and to respond to the spotting of slicks?

The maintaining of an effective communication network has remained a key element of the implementation of the FAP. EPA has remained

the hub of the communication network, with its Floatables Coordinator as the link with the USACOE, the United States Coast Guard ("USCG"), the NYCDEP, the NJDEP, the NYSDEC, the NYCDOS, the National Oceanic and Atmospheric Administration ("NOAA") and the public.

The two main contributors of slick sightings are the EPA helicopter which routinely patrols the Harbor, southern Long Island and the New Jersey coast and the NJDEP plane which routinely patrols the New Jersey coast. As reports of Harbor Complex slicks (floatable debris or oil) are received by the EPA Floatables Coordinator, the reports are evaluated to determine appropriate action. Appropriate actions include the reporting of the slick information to the USACOE or the USCG (for oil slicks). For cases in which a slick report identifies a slick not large enough or too disperse to warrant the deployment of a USACOE skimmer vessel, no action is taken. The following is a table generated from the 2000 slick sightings (all by the EPA helicopter) that resulted in the contact of either the USACOE or the USCG by the EPA Floatables Coordinator:

2000 Floatables Action Plan Slick Reports

DATE	TIME	REPORT
5/24	8:30 AM	1) 800' x 100' heavy density slick 1 mile north of Goethals Bridge, wood, reeds, plastic; 2) 1000' x 2' light density slick 3 miles north of Verrazano Bridge, near green can #1
5/30	10:10 AM	Oil slick observed in Kill Van Kull, near Standard Oil Cleaning in Bayonne; no booms visible
5/31	10:45 AM	Floatables slick observed 300-400 yards north of the Verrazano Bridge in the Hudson River, approximately 100'x 8'. Oil slick observed in the Manasquan Inlet in New Jersey.
6/2	9:15 AM	Several floatables slicks observed: 1) Arthur Kill, 1 mile long, south of Pralls Island, , scum, wood plastic; 2) Arthur Kill, 1/4 mile ling, north of Goethals Bridge, wood; 3) Newark Bay, ½ mile long, near red buoy #6 on Bayonne side, moderate density; 4) Newark Bay, ½ mile long, middle of Bay; 5) Newark Bay, 200' x 200'
6/5	9:30 AM	Oil slick observed in Arthur Kill, beginning near the middle of the landfill and extending south to buoy 18, 50 yards x 10 yards.

6/12	9:30 AM	Oil slick observed near ship graveyard in Arthur Kill, near green buoy 11, ½ mile long
6/16	9:10 AM	Oil slick in Arthur Kill, 1 mile ling x 10', near red buoy 32, from Goethals Bridge to Fresh Kills landfill
6/20	10:00 AM	Floatable slick observed in Newark Bay, south of red buoy 10, approximately ½ mile long by 3-4'
6/28	10:00 AM	Oil slick observed in Arthur Kill, extending approximately 1 mile south from red buoy 16
6/29	9:15 AM	2 oil slicks observed: 1) Arthur Kill, old ship graveyard, extending to red buoy 18, rainbow sheen, and 2) Hudson River, Cunard Line dock, 200-300 meters, NY side, rainbow sheen Scattered floatable debris in Newark Bay, East River, the Narrows
6/30	8:46 AM	Observed floatables slick, near entrance to Newark Bay, near red buoy 8 and extending south, approximately 3-4 yards x 1/4-1/2 mile long, dense, mostly grass and wood
7/5	2:45 PM	Floatable slick observed north of Verrazano Bridge, 2.5 miles long, moderate density
7/13	10:15 AM	Oil slick observed in Arthur Kill, approximately 1 mile long, extending south from red buoy 24, rainbow sheen, emanating from old ship graveyard

7/14	**10:27 AM**	**Oil slick in Arthur Kill adjacent to Fresh Kills Landfill. Rainbow sheen about 1 mile long.** **Large (6' X 4') piece of wood south of buoy Red 10 in Newark Bay** **Light, scattered debris south of Buoy Green 7.**
7/17	**10:00 AM**	**Narrows ½ mile north of Verrazano. Wood & paper, light to med. Density 100 metersX50 meters** **Arthur Kill Red Buoy 24: scattered light debris, mainly paper, about 1 mile long extending north from buoy**
7/18	**10:30 AM**	**200'X200' light density slick, primarily scattered wood, North of Governor's Island** **Graves End Bay just south of mid-span Verrazano Narrows Bridge: light/medium density slick, primarily wood, 300 meters by 400 meters.**
7/19	**10:30 AM**	**Newark Bay near Red Buoy #8: scattered, light wood and debris about 250 meters long by 1-2 meters wide.**
7/20	**10:40 AM**	**Harbor clear however spotted what appeared to be a floating tank of some sort in East River ½ mile north of Williamsburg Bridge**
8/4	**9:30 AM**	**Oil slick observed in Kill Van Kull, 100', North of Bayonne Bridge** **Scattered debris North of Verrazano Bridge, 50' - 100' and ½ mile south of Verrazano Bridge, extending to Coney Island, ½ mile long**

8/9	**9:45 AM**	**Oil slicks noted in Newark Bay near Green Buoy #5 and in the East River south of Roosevelt Island. In both cases, oil was in 5' by 30' patches with the patches extending more than 1 mile. Both were Rainbow sheen.**
8/11	**10:40 AM**	**Arthur Kill, just south of Buoy 4 (near Outer Bridge): light scattered debris 10 feet wide, ½ mile long** **Gravesend Bay: light scattered debris 10 feet wide by 1 mile long** **East River just north of Williamsburg Bridge: rainbow oil slick about 1 mile long**
8/18	**10:30 AM**	**Large slick observed in Kill van Kull, 1 mile north of Bayonne Bridge, scattered wood and debris**

V. How effective has the FAP been in ensuring timely notification of beach operators of potential wash-ups of floatable debris?

Due to the effectiveness of the FAP in 2000 in minimizing the escape of floatable debris from the Harbor Complex, it has not been necessary for the EPA Floatables Coordinator to notify beach operators of potential wash-ups of floatable debris. However, a notification system has been maintained and is in place whereby, based on the sighting of a floatable debris slick outside the Harbor Complex, the EPA Floatables Coordinator is to contact the following:

In New Jersey: NJDEP, which in turn notifies local beach operators; and

In New York: NYSDEC Region 1 (Nassau and Suffolk counties) or NYSDEC Region 2 (New York City), depending on the location of the spotted slick, and the New York Beach Information Network (a cooperative network of many Long Island beach operators for the obtaining of beach condition information).

Although routine clean-up operations are projected to address the significant majority of floatable debris slicks, a program is also established to address non-routine events such as the following:

- vessel accidents or illegal dumping; and

- floatable debris slicks sighted in the Bight, beyond the transect between Sandy Hook and Rockaway point.

The EPA Floatable Coordinator, upon receipt of a Bight floatable slick sighting is to notify appropriate NJDEP and NYSDEC Floatable Coordinators. Individual State Coordinators are then responsible for notifying appropriate local authorities of an impending washup, who would in turn organize resources for clean-up. NOAA has developed a forecasting program that may be used to predict the impact area for Bight-sighted floatable debris slicks based on several input parameters (wind direction, sea conditions, etc...). This forecasting program has been used in the past, but was not used in 2000.

VI. How effective has the FAP been in minimizing beach closures?

The FAP has been very successful in minimizing beach closures as evidenced by the fact that there was only **ONE** beach closure incident in 2000 due to floatable debris.

After the floatable debris washups in New Jersey in 1987, the NJDEP's Cooperative Coastal Monitoring Program began tracking beach

closures due to floatable debris washups in terms of closures of designated bathing areas. A designated bathing area is typically a stretch of beach patrolled by a lifeguard. A closure of such an area must last for a minimum of one day in order to be counted as an official closure.

Currently, the NJDEP formally defines a beach closure as follows:

The prohibition of primary contact activities at a regulated recreational beach and/or beaches contiguous to these beaches; the term "primary contact activities" implies a certain degree of water immersion/skin contact; regulated beaches must meet criteria detailed in Chapter 9 of the State Sanitary Code, these criteria include the presence of lifeguards, certain safety equipment and water quality testing.

Nassau County does not factor the amount of time that a beach is closed into its reporting of "beach closings due to floatable debris." Rather, based on a cooperative working relationship between the Nassau County Department of Health (NCDOH) and beach operators, beach operators notify the NCDOH when medical debris is discovered either on the beach or in the water. If the quantity of medical debris found on land is manageable, it is collected and no beach closure ensues. If medical debris is found in the water, the beach will typically be, based on an inspection by the NCDOH, closed.

Being further away from the NY/NJ Harbor, Suffolk County does not specifically associate medical waste with beach closings due to floatable debris. The Suffolk County Department of Health Services (SCDHS) works cooperatively with beach operators to close beaches in cases of "significant amounts of floatable debris" either already on the beach or in the water. Beaches remain closed until debris is removed and incoming tides no longer carry significant debris to the shoreline. Beach operators can independently close beaches and alert the SCDHS in such instances.

The following table demonstrates the success of the FAP in minimizing designated bathing area closures due to floatable debris washups in New Jersey:

New Jersey Floatable Debris-Related Beach Closure Data

Year	Total # of Designated Bathing Area Closures in New Jersey between May 15 and September 15

1988	**19 (pre-FAP)**
1989	**9 (2 incidents)**
1990	**10 (1 incident)**
1991	**0**
1992	**0 (1 unofficial incident)**
1993	**0**
1994	**0**
1995	**0**
1996	**0**
1997	**0**
1998	**0**
1999	**0**
2000	**0**

As the table indicates, New Jersey has not had a closure of a designated bathing area due to floatable debris since 1990. This is due in large part to the implementation of the FAP.

Implementation of the FAP in New York has also been highly successful. After the summer of 1988, in which beaches in New York from Coney Island in Brooklyn to Tiana Beach in Suffolk were closed for varying periods of time due to floatable debris washups, the FAP has resulted in minimizing beach closures as indicated in the following table.

New York Floatable Debris-Related Beach Closure Data

Year	Total # of Beach Closure Incidents in New York between May 15 and September 15
1989	0
1990	0
1991	1
1992	1
1993	0
1994	0
1995	0
1996	0
1997	0
1998	1
1999	0
2000	1

The FAP has been assessed in the past on a bi-State floatable debris-based beach closure "incident" basis. Using this measure the following table and graph indicate the success of the FAP in minimizing beach closures.

Combined NY / NJ Floatable Debris-Related Beach Closure Data

Year	Total # of Floatable Debris-Based Beach Closure Incidents in New Jersey and New York between May 15 and September 15
1988	9 (pre-FAP)
1989	2
1990	1
1991	1
1992	2
1993	0
1994	0
1995	0
1996	0
1997	0
1998	1
1999	0
2000	1

For purposes of FAP assessment, there was one incident in 2000 for which beaches were closed. Beaches in Nassau County were closed along the Long Beach strip on August 7, 2000. A total of nine separate beaches (two in the Town of Hempstead and seven in the Village of Atlantic Beach) were closed due to the discovery of between 40-60 syringes. Much plastic was found on this beach strip and although the syringes are classified as "medical debris," no other medical debris was found. State protocol requires the closing of beaches when medical debris is found in the water. While not necessarily the case in this situation, beach operators decided to voluntarily close the beaches as a precautionary measure. Beaches were reopened on August 8, 2000, without a specific source being identified.

VII. Rain and the FAP

What has been the impact of rainfall on the success of the FAP?
Discharges from both CSO's and storm sewers are triggered by

rainfall events. The correspondence, however, between rainfall events and floatable debris slick formation is based on a variety of factors including rainfall intensity, duration of rainfall, time frame between a particular rainfall event and the previous rainfall event, and the location of a rainfall event. In past FAP assessment reports, rainfall data has been included from a variety of specific locations: Newark International Airport and Sandy Hook in New Jersey, and Central Park, Dix Hills, the South Shore and John F. Kennedy International Airport in New York. In order to utilize rainfall data that more accurately reflects the broader region of Northern New Jersey and New York City, where the Harbor's CSO discharges are located, data from the National Climatic Data Center ("NCDC") has been obtained and is presented as monthly rainfall in inches for the "summer months" (May through September) for each year between 1985 and 2000 as follows:

State of New Jersey Rainfall Data: 1985 - 2000
(National Climatic Data Center New Jersey Division 1)

	MAY	JUNE	JULY	AUGUST	SEPTEMBER	Summer Total
1985	5.73	5.25	4.51	3.90	6.03	**25.42**
1986	1.72	3.39	6.04	5.23	2.78	**19.16**
1987	2.14	3.63	6.15	5.21	5.69	**22.82**
1988	5.66	0.99	8.55	3.44	2.77	**21.41**
1989	9.99	6.65	4.06	4.71	8.40	**33.81**
1990	8.81	3.38	4.40	8.82	2.33	**27.74**
1991	3.07	3.14	4.41	4.57	4.98	**20.17**
1992	3.13	6.34	4.73	4.04	3.80	**22.04**
1993	0.99	3.05	1.92	3.24	6.11	**15.31**
1994	3.67	5.27	4.69	5.91	2.74	**22.28**
1995	3.43	2.36	5.13	1.25	4.24	**16.41**
1996	3.45	5.29	7.88	2.31	6.30	**25.23**
1997	3.40	2.57	6.13	4.28	3.00	**19.38**
1998	6.91	6.05	6.05	3.18	2.27	**24.46**
1999	3.32	1.06	1.03	4.98	12.04	**22.43**
2000	4.83	4.81	5.89	5.54	3.92	**24.99**
Average	**4.39**	**3.95**	**5.10**	**4.41**	**4.84**	**22.69**

State of New York Rainfall Data: 1985 - 2000
(National Climatic Data Center New York Division 4)

	MAY	JUNE	JULY	AUGUST	SEPTEMBER	Summer Total
1985	5.32	5.00	3.67	3.75	3.68	**21.42**

1986	0.95	2.64	5.04	4.86	1.62	**15.11**
1987	1.81	3.19	3.38	4.69	4.45	**17.52**
1988	4.29	1.47	6.13	2.19	3.21	**17.29**
1989	10.21	7.13	5.64	6.42	5.19	**34.59**
1990	7.70	3.02	3.57	8.51	2.70	**25.50**
1991	3.31	2.22	2.94	7.81	4.12	**20.40**
1992	3.13	4.36	5.03	5.57	3.89	**21.98**
1993	1.27	2.08	1.96	2.86	5.29	**13.46**
1994	3.81	1.52	2.72	5.80	3.78	**17.63**
1995	3.07	2.58	4.03	0.51	3.95	**14.14**
1996	3.07	4.19	6.47	2.95	5.53	**22.21**
1997	3.15	2.52	5.06	4.73	1.75	**17.21**
1998	6.12	6.21	1.38	2.57	2.71	**18.99**
1999	3.84	0.90	1.19	4.28	7.67	**17.88**
2000	4.28	4.46	6.01	3.86	4.67	**23.28**
Average	**4.08**	**3.35**	**4.01**	**4.46**	**4.01**	**19.91**

NCDC New Jersey Division 1 includes all of Northern New Jersey, south to just north of Sandy Hook and NCDC New York Division 4 includes New York City and Nassau and Suffolk Counties.

From this information, the following general statements can be made:

- The summers of 1987 and 1988, the two years in which significant floatable debris washups occurred, were summers of average or below average rainfall.

- The summer of 1989, the first year that the FAP was implemented, was a summer of significantly above average rainfall.

- The summers of 1990, 1991 and 1992, were generally summers of above average rainfall.

- The summers of 1993 - 1995, years in which no floatable debris-related beach closures occurred, were generally summers of below average rainfall.

- The summer of 1999 included months of June and July which were exceptionally low rainfall months in both New York and New Jersey. For New York, 1999 included the lowest June and July rainfall since 1985. For New Jersey, 1999 included the second lowest June rainfall and the lowest July rainfall since 1985.

- Generally, the summer of 2000 included months of higher than average rainfall for both New York and New Jersey.

That the years of 1994 (in New Jersey) and 1996 (in both New

Jersey and New York) included summer months of above average rainfall for which no floatable debris-related beach closures occurred is noteworthy. The variety of activities implemented under the FAP and in concert with the FAP since 1989 have clearly resulted in far greater control of floatable debris slicks exiting the Harbor and affecting beaches.

VIII. Wind and the FAP

What role do wind speed, wind direction and currents play in the transport of floatable debris?

In past FAP assessment reports, wind speed and directions were provided for a variety of specific locations: Newark International Airport and Sandy Hook in New Jersey, and Central Park, Dix Hills, the South Shore and John F. Kennedy International Airport in New York. The value of this specific-location information is, however, minimal. Wind speeds and directions are variable from location to location and can differ between land and sea. Winds also engage in a complex interplay with tidal currents. Such data provides little conclusive correlation between the presence of floatable debris in the Harbor, its exit to the Bight and its eventual washup on Long Island and New Jersey beaches. What can be said of wind speeds and directions in regard to the movement of floatable debris is summarized as follows:

- Based on tests conducted, there appear to be four categories of floatable debris. These four categories are defined below and

the major contributor(s) to their movements is indicated:

Categories of Floatable Debris

Category	Definition	Predominant Transport Cause(s)
Floating	Items that float on the top of the water surface (e.g., Styrofoam cups, plastic containers, metals cans)	Wind and Surface Current
Partially Submerged	Items that are found partially above the water surface and partially below (e.g., partially filled cans or bottles)	Wind and Surface Current
Submerged	Items that float just at or below the water surface (e.g., driftwood that has taken on water)	Surface Current
Neutrally Buoyant	Items which exist in the water column (e.g., plastic bags or plastic fragments)	Subsurface Current

- It appears that the transport of floatable debris over long distances is affected by large-scale wind and offshore current systems.

- Washups of floatable debris in 1987 and 1988 are believed to have been linked to favorable meteorological and oceanographic conditions. It is believed that persistent summer winds from the south-southwest, along with their associated mean currents to the northeast, drove floatable debris ashore, on to the Long Island beaches.

- Summertime climatological and meteorological conditions favor floatables washups on Long Island and New Jersey beaches. There is an increased frequency of winds blowing towards the west, northwest, north and northeast.

- Oceanic winds cause circulation patterns in the water which result in windrows. Windrows concentrate floatable debris within narrow bands, usually parallel to the current direction. Such floatable debris slicks can washup onto shores if given favorable short-term conditions of winds and tides.

- Once floatable debris exits the Harbor and enters the Bight, its transport is determined by the Bight’s meteorological and hydrodynamical activities.

Based on this discussion, it is imperative that Harbor-generated floatable debris not be permitted to exit the Harbor and enter the Bight. The FAP has recognized this basic aim and has sought to do just that. The interagency implementation of the FAP has significantly reduced the amount of floatable debris that both enters the Harbor and exits the Harbor, as evidenced by other sections of this report.

IX. NYCDEP Long-term Floatable Debris Control

On June 25, 1992 the NYSDEC and the NYCDEP entered into an Order on Consent ("CSO Abatement Order") providing for the planning, designing and construction of a comprehensive CSO abatement program for New York City. Generally, the CSO Abatement Order requires the abatement of CSO impacts in two "Tracks." Track I consists of a series of deadlines which require the NYCDEP to plan, design, commence construction and complete construction of CSO abatement facilities designed to prevent violations of permit requirements for minimum levels of dissolved oxygen and maximum levels of coliform bacteria. End dates for these Track I facilities range from 2001 to 2006. Track II requires the NYCDEP to plan, design, and commence construction of facilities designed to abate substantially all floatable debris and settleable solids (termed the "Comprehensive Plan") from CSO outfalls where floatable debris will not be abated by the construction projects included in Track I. Dates for the initiation of construction of Track II facilities are area specific and are generally specified to be within 18 months of the completion of Track I facilities.

Because the majority of the deadlines for Track I and Track II facility construction extend beyond the year 2000, the 1992 CSO Abatement Order also requires that the NYCDEP undertake certain interim measures to address floatable debris control. The NYCDEP was required to purchase and operate one large open water skimmer vessel, designed to supplement U.S. Army Corps of Engineers floatables skimming actions in the New York / New Jersey Harbor. NYCDEP was also required to establish a booming and skimming program (through the purchase and operation of four skimming boats) to collect and remove substantially all waterborne floatables in certain prescribed Jamaica Bay tributaries, inner / outer Harbor tributaries and from certain outfalls in beach-sensitive open waters around Staten Island, western Brooklyn and the upper East River. These interim measures are discussed earlier in this assessment report.

Another interim measure for floatables control mandated by the

1992 CSO Abatement Order was that the NYCDEP would complete a systematic Citywide survey of catch basins (over 120,000 throughout the City). This survey was to consist of cleaning each catch basin that requires cleaning and determining whether the catch basin had a hood in place. If the catch basin lacked a hood, the NYCDEP was to replace the hood by no later than September 1993. The rationale behind this requirement was that although catch basins were primarily equipped with hoods for odor control purposes, the presence of a functioning hood traps floatables in the catch basin, minimizing their delivery to the downstream sewer system. Based on a series of discussions between the NYSDEC and the NYCDEP, with the support of EPA, the catch basin program was modified and was incorporated into the 1995 CSO Abatement Order modification.

Under this ongoing catch basin hood program, the entire City will be covered with a short term control floatable debris control technology, either booming and skimming or catch basin hoods. Floatable debris control measures were also strengthened above the original CSO Abatement Order in that there will now be a recurring hood inspection and replacement program to ensure the continued effectiveness of the hood floatable debris control technology. This revised phased catch basin hood program is expected to augment beach protection efforts for a number of years. Work has been conducted through completion of a catch basin inventory, cleaning and hooding of basins.

Phase I is defined as those Community Districts where the booming and skimming program captures floatables from less than 50 per cent of the area for which the Mayor's Office of Operations found a street litter rating of greater than 1.4 as of July 1993. Phase II is defined as Community Districts where the booming and skimming program captures floatables from more than 50 per cent of the area or for which the Mayor's Office of Operations found a street litter rating of 1.4 or lower in July 1993, and Community Districts where booming and skimming captures floatables from between 50 and 75 per cent of the area, and selected Community Districts not covered by the booming and skimming program. Hooding of basins is taking place in both CSO and storm sewer areas of New York City.

Phase I hood installations were completed on December 26, 1997. The Phase I inventory tallied 44,374 structures and the hooded percentage of structures was increased to 85.7% of all structures.

Phase II hood installations were completed on September 24, 1998.

The Phase II inventory tallied 50,969 structures and a final Phase II summary is being prepared.

NYCDEP submitted a work plan for NYSDEC's approval to determine an appropriate and cost-effective catch basin cleaning program for floatables capture and flood control in locations of various street litter characteristics throughout the City. Based on the results of the completed study (pending work plan approval by the NYSDEC), the NYCDEP proposed to incorporate the findings into the City's Comprehensive Plan.

A draft work plan entitled, "Determining Catch Basin Cleaning Frequency for Control of Street Flooding and Floatables Discharges" was submitted to the NYSDEC for review in April 1996. The NYCDEP finalized the work plan in January 1997. This work plan called for two phases of work, the first of which was scheduled for completion by June 1997. A report entitled "Catch Basin Cleaning Program for Floatables Capture and Flood Control" was completed and submitted in June 1997. The second phase of work called for in the work plan will be addressed in an upcoming pilot study.

NYCDEP is also extending the catch basin hooding program beyond the Phase I and II areas. These other areas are collectively termed the Phase III areas. This program was recommended in the June 1997 Plan. NYCDEP initiated the hooding of Phase III areas in December 1998 and substantially completed it by October 28, 1999. A total of 26,378 catch basins were cleaned and 14,307 hoods were installed in Phase III areas.

The NYCDEP June 1997 Draft City-Wide CSO Floatables Plan (i.e., the Comprehensive Plan) can be summarized as follows:

NYCDEP's Draft Comprehensive Plan for Floatable Debris Control (Updated Information Included as of December 1998)

Activity	Start Date	End Date	Estimated Capital Cost	Estimated Annual Cost
1. Catch Basin Surveys, Hooding, Phase I/II Areas	February 1996	September 1998	$24,000,000	N/A
2. Booming and Skimming Program	Ongoing	Ongoing or until superseded by Comprehensive Plan	$4,353,000	$840,000
3. Catch Basin Hooding of Phase III Areas	December 1998	April 2000	$6,050,000	N/A
4. City-Wide Reconstruction of Unhoodable Catch Basins	September 1999	September 2009	$120,000,000	N/A
5. City-Wide Catch Basin Re-inspections	Ongoing	N/A	N/A	$1,347,000
6. Public Education Program	December 1997	December 1998	$192,000	N/A
7. Illegal Dumping Control	December 1997	Ongoing or until superseded by Comprehensive Plan	N/A	N/A
8. Floatables Plan Reporting	Ongoing	N/A	N/A	N/A
9. Pilot Studies and Demonstration Projects	December 1997	Ongoing or until superseded by Comprehensive Plan	$4,000,000	N/A
TOTAL			**$158,595,000**	**$2,223,000**

The Comprehensive Plan is intended to provide CSO controls outside of the Track I program which focused on larger CSO discharge areas and the WPCPs. Since its submittal there have been changes in the Comprehensive Plan to address new concerns from the NYSDEC. One of the has been to include the investigation of settleable solids, oil and grease as a CSO issue.

The Comprehensive Plan has been evaluating CSO-control technologies. NYCDEP is seeking technologies that have a wide application such as catch basin hoods, regulator baffles and bending weirs for controlling floatables and where applicable, uses a combination of technologies to achieve the reduction goals. A recommendation for CSO-control technologies to be used in the Bowery Bay WPCP drainage area is expected to be completed

by June 2001 and then plans will be developed for other NYCDEP WPCP drainage areas. A NYCDEP-developed matrix for comparing the various floatables reduction technologies is attached to this FAP Report. On this matrix, technologies are ranked from low cost/high removal to high cost/low removal.

The following summarizes the advancements in the Comprehensive Plan program:

1. Catch Basin Hooding: In 2000, NYCDEP completed its hooding of catch basins throughout the City, in accordance with the requirements of the 1995 modification to the 1992 NYSDEC CSO Abatement Order on Consent and hooded basins in Phase III areas as well. Pending field and data entry quality assurance checks, a total of 136,592 catch basins were inventoried.

2. Booming and Skimming Program: NYCDEP will continue its booming and skimming program at major CSO outfalls until at least the construction of Track I facilities (between 2001 and 2006).

3. City-Wide Reconstruction of Unhoodable Catch Basins: Based on specific design configuration criteria, certain catch basins are termed "currently unhoodable" by the NYCDEP. In order to place a hood into these catch basins, the catch basins must be rebuilt. NYCDEP has identified this activity as the most costly of all its Track II floatable debris control activities.

4. City-Wide Catch Basin Re-inspections: NYCDEP will continue its 2-year cycle of catch basin inspecting it ensure that hoods are still in place.

5. Public Education Program: NYCDEP will develop a multi-faceted public education program to include a) the development of a public relations and advertising plan for promoting public participation in keeping litter out of CSO's; b) the initiation of a CSO Litter Abatement Education Program for schools; c) the investigation of a potential collaborative effort with other agencies such as the NYCDOS and the EPA; d) the establishment of a Catch Basin Stenciling Committee; and e) the establishment of a Public Education Advisory Committee.

6. Illegal Dumping Control: NYCDEP will coordinate with the NYCDOS police in cases where there is evidence of illegal shoreline dumping of floatable debris. This action is underway, with reports by NYCDEP to the NYCDOS police leading to charges being pressed and litigated.

7. Floatables Plan Reporting: NYCDEP is committed to ongoing reporting of the progress of its floatable debris control program.

8. Pilot Studies and Demonstration Projects: NYCDEP selected the above activities to control floatable debris based on their implement ability and overall effectiveness in achieving a substantial reduction in discharges of floatable debris from CSO discharges. Other promising technologies were not selected because their implement ability and effectiveness are unknown. NYCDEP plans to test a variety of these technologies to determine if any could replace or augment the technologies presently selected. The technologies to be tested include baffles, catch basin inserts, vortex technologies, horizontal mechanical screens, in-line netting and continuous deflective separators. Under the Jamaica Tributaries CSO Project, the NYCDEP is proceeding with pilot testing of CSO control technologies to reduce CSO pollutants including floatables, settleable solids, and other pollutants. Six control technologies were evaluated which included screens, in-line netting, bending weirs, baffles and brush screens. The hydraulics analysis of the technologies found that surcharge conditions occur under design-flow conditions, limiting the applicable technologies to bending weirs and baffles. Fourteen regulators have been identified as potential sites for the demonstration tests of baffles and bending weirs. Further flow analysis and design will continue through mid-2001. No construction schedule has been set.

The Cryder's Lane CSO, located at the base of the Throgs Neck Bridge on Little Neck Bay, Queens, has received a large number of community complaints about odors, refuse, aesthetics and rats. NYCDEP is conducting work at this site such that the CSO outfall channel will be rebuilt and fitted with an end-of-pipe floatables control netting device.

Another major activity of the recommended Draft Comprehensive Plan is the continuation of the program started by the NYCDEP to increase the amount of wet weather flow captured and treated at its water pollution control plants. It is estimated that implementation of the Plan will reduce the discharge of floatable debris to the Harbor Complex by 85 to 87 per cent City-wide relative to the levels which existed prior to the implementation of the Plan (before the booming and skimming program was implemented). Differences in this estimate are based on the effectiveness of the City's public education program. The purpose of this effort is to accurately determine how much flow each WPCP can process during wet weather and to develop a wet weather operating plan. The revised flow limit will be included

in the next discharge permit issued for the WPCP. This evaluation is expected to be completed in 2001.

NYCDEP has developed a cost model to enable cost assessments and comparisons with the Comprehensive Floatables Abatement Program project, Track I retention tank projects and ongoing City nitrogen reduction projects. With the model, the City can estimate the impact of new projects on household wastewater costs, as well as consider the costs of new and existing programs. This model was completed in December 2000.

X. NJDEP Long-term Floatable Debris Control

The NJDEP, under its 1995 (and reissued in 2000) general permit for combined sewer systems, requires permittees with combined sewer systems to develop, evaluate and implement at least one interim solids/floatables control measure for each CSO point from either of the categories listed below:

> Screening Technologies: This category includes, but is not limited to, baffles, trash racks, static screens, end-of-pipe netting and mechanical screens. All solids/floatables screening technologies control measures are to be designed to comply with the performance criteria (no solids/floatables are to be discharged that can pass through a screen having square openings of 0.5 inches) specified for long-term solids/floatables control measures.
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> Skimming Technologies: This category includes, but is not limited to, the placement of booms around an outfall or groups of outfalls, skimming open water areas with "skimming boats" and flow balance method containment. Selected interim solids/floatables control measures shall be implemented, operated and/or maintained until the long-term solids/floatables control measures are in place.

On a long-term basis, permittees are directed to construct solids/floatables control measures which will capture and remove solids/floatables which cannot pass through a bar screen having a bar spacing of 0.5 inches (13.0 mm) from all CSO's, unless the permittee can demonstrate, to the satisfaction of the NJDEP, that an alternative control measure is more appropriate for a CSO point. A detailed table is attached to this report describing the status of compliance with these interim and final floatable debris abatement requirements.

In general, once the NJDEP approves the long-term solids/floatables plan submitted by a permittee, a 30-month time frame is initiated as follows:

a) Permittee is to submit a treatment works approval ("TWA") application for NJDEP approval (within 12 months of plan approval)

b) NJDEP is to approve permittee's submitted TWA application (within 3 months of receiving the TWA application)

c) Permittee is to construct final solids/floatables control measures (within 15 months of TWA)

The NJDEP has taken and will continue to take enforcement actions in cases of permittee non-compliance with these time frames to gain enforceable implementation time schedules.

Attached to this FAP Report is a summary of the floatables abatement program (focusing on the long-term floatables plans) for each New Jersey combined sewer system permittee. As of December 31, 2000, and based on this information from the NJDEP, solids/floatables facilities have been constructed and are operating for approximately 58 of New Jersey's CSO points.

XII. References

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XII. Attachments

a) Floatables Action Plan Graphs
b) Map: New York Bight Apex, New York/New Jersey Harbor Complex
c) USACOE "Floatable Days - 2000"
d) National Climatic Data Center rainfall areas 1 through 4
e) Tables of Other Harbor Complex Measures to Reduce Floatable Debris
f) Summary of Past Floatable Debris Beach Closing Incidents
g) Summary of New Jersey Community Floatables Abatement Programs
h) PVSC Skimmer Vessel "Newark Bay"
i) NYCDEP Floatables Reduction Program Brochure
j) New Rochelle Storm Water Floatable Debris Boom Description and Pictures