

NPDES compliance summary
report, fiscal year 2006

Massachusetts Water Resources Authority

Environmental Quality Department
Report ENQUAD 2007-04



NPDES COMPLIANCE SUMMARY REPORT
Fiscal Year 2006

Frederick A. Laskey
Executive Director

Michael J. Hornbrook
Chief Operating Officer

Dr. Andrea C. Rex
Director, Environmental Quality Department

By
David Wu

Technical Report No. 2007-04
Environmental Quality Department
Operations Division
Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129
(617) 242-6000

Contributors

Grace Bigornia-Vitale
Mark Sullivan
Kelly Coughlin
Maury Hall

Citation:

Wu D. 2007. NPDES compliance summary report, fiscal year 2006. Boston: Massachusetts Water Resources Authority. Report ENQUAD 2007-04. 139 pp.

Table of Contents

EXECUTIVE SUMMARY	1
Deer Island Treatment Plant	1
Combined Sewer Overflow Facilities	4
Collection and Transport System	5
Future Outlook	7
I: INTRODUCTION	9
II: DEER ISLAND TREATMENT PLANT	10
II.A.1 Influent Flow	10
II.A.2 Influent Conventional Parameters and Nutrients	11
II.A.3 Influent Priority Pollutants	12
II.A.4 Effluent Conventional Parameters and Nutrients	14
II.A.5 Effluent Priority Pollutants	17
II.A.6 Whole Effluent Toxicity	18
II.B.1 Compliance with Regulatory Limits	19
II.B.2 Effluent Quality Compared to Water Quality Standards	25
II.C.1 Ambient Monitoring Plan	25
II.C.2 The Contingency Plan	27
III: COMBINED SEWER OVERFLOW FACILITIES	31
III.A.1 Cottage Farm Activations	32
III.A.2 Cottage Farm Conventional Parameters	33
III.A.3 Cottage Farm Metals	33
III.B.1 Prison Point Activations	34
III.B.2 Prison Point Conventional Parameters	35
III.B.3 Prison Point Metals	35
III.C.1 Somerville Marginal Activations	36
III.C.2 Somerville Marginal Conventional Parameters	37
III.C.3 Somerville Marginal Metals	37
III.D.1 Fox Point Activations	38
III.D.2 Fox Point Conventional Parameters	39
III.D.3 Fox Point Metals	39
III.E.1 Commercial Point Activations	40
III.E.2 Commercial Point Conventional Parameters	41
III.E.3 Commercial Point Metals	41
IV: SLUDGE PROCESSING	42
IV.A Pelletizing Process	42
IV.B Sludge Pellet Regulations	42
V: TRANSPORT SYSTEMS	45
V.A.1 North System Headworks Choking	45
V.A.2 North System Sanitary Sewer Overflows	47
V.B South System Sanitary Sewer Overflows	47
V.C Infiltration/Inflow	48
VI: MISCELLANEOUS NPDES PERMIT REQUIREMENTS	49
VI.A Facility Best Management Practices Plans	49
VI.B Water Conservation / Dry Day Flow Limit	49
VI.C Pollution Prevention Program	49
VI.D Groundwater Remediation	50
VI.E Local Limits and Industrial Pretreatment Programs	50
VI.F Reporting	50

APPENDICES

- A: Deer Island Treatment Plant Data
- B: Cottage Farm CSO Facility Data
- C: Prison Point CSO Facility Data
- D: Somerville Marginal CSO Facility Data
- E: Fox Point CSO Facility Data
- F: Commercial Point CSO Facility Data
- G: NPDES Monitoring Requirements
- H: An Overview of the MWRA Sewerage System and Facilities
- I: Instrument Detection Limits, Method Detection Limits, and Quantitation Limits
- J: Priority Pollutants List and Other Parameters
- K: Glossary, Abbreviations, and Units

List of Tables

Table 1	Sanitary Sewer Overflows, FY06	7
Table II.A.1	Classification of DITP Influent, FY06	11
Table II.A.2	Deer Island Influent Characterization, FY94-FY06	12
Table II.A.3	Deer Island Removal Efficiency, FY06	14
Table II.A.4	Removal Efficiency vs. Degree of Secondary Treatment, FY06	15
Table II.A.5	Deer Island Effluent Characterization, FY94-FY06	16
Table II.A.6	Deer Island Effluent, Results of Toxicity Testing, FY06	19
Table II.B.1	Deer Island Effluent Quality Compared to Permit Limits, FY06	19
Table II.B.2	NPDES Violations at Deer Island, FY94-FY06	20
Table II.B.3	Comparison of DITP Effluent with Water Quality Criteria, FY06	25
Table II.C.1	Post-Discharge Ambient Monitoring Summary	26
Table II.C.2	Contingency Plan Threshold Summaries	27
Table II.C.3	Contingency Plan Exceedances, FY06	29
Table III.A.1	Cottage Farm CSO Activations Summary	32
Table III.A.2	Cottage Farm CSO Effluent Characteristics, FY06	33
Table III.A.3	Cottage Farm Metals, FY06	34
Table III.B.1	Prison Point CSO Activations Summary	34
Table III.B.2	Prison Point CSO Effluent Characteristics, FY06	35
Table III.B.3	Prison Point Metals, FY06	35
Table III.C.1	Somerville Marginal CSO Activations Summary	36
Table III.C.2	Somerville Marginal CSO Effluent Characteristics, FY06	37
Table III.C.3	Somerville Marginal Metals, FY06	37
Table III.D.1	Fox Point CSO Activations Summary	38
Table III.D.2	Fox Point CSO Effluent Characteristics, FY06	39
Table III.D.3	Fox Point Metals, FY06	39
Table III.E.1	Commercial Point CSO Activations Summary	40
Table III.E.2	Commercial Point CSO Effluent Characteristics, FY06	41
Table III.E.3	Commercial Point Metals, FY06	41
Table IV.B.1	Federal and State Limits for Sludge Pellet Metals	43
Table IV.B.2a	Summary of Sludge Pellet Analysis, Calendar Year 2005	44
Table IV.B.2b	Summary of Sludge Pellet Analysis, Calendar Year 2006	44
Table V.A.1	Sanitary Sewer Overflows, North System, FY05-FY06	47
Table V.B.1	Sanitary Sewer Overflows, South System, FY05-FY06	48

List of Figures

Figure 1	MWRA Flows, FY92-FY06	2
Figure 2	DITP Dry Day Flows, FY06	2
Figure 3	DITP Effluent TSS Removal Rates	3
Figure 4	DITP Effluent BOD/cBOD Removal Rates	3
Figure 5	NPDES Violations at DITP, FY94-FY06	4
Figure 6	CSO Activations, FY92-FY06	5
Figure 7	CSO Volume Treated, FY92-FY06	5
Figure 8	Headworks Choking, FY92-FY06	6
Figure II.A.1	DITP Influent Flow Compared to Precipitation, FY06	10
Figure II.A.2	DITP Influent Flow Compared to Precipitation, FY92-FY06	11
Figure II.A.3	DITP Mean Influent Metals Loadings, FY92-FY06	13
Figure II.A.4	DITP Mean Influent Organics Loadings, FY94-FY06	14
Figure II.A.5	DITP Mean Effluent Nutrient Concentrations, FY94-FY06	17
Figure II.A.6	DITP Mean Effluent Metals Loadings, FY89-FY06	17
Figure II.A.7	DITP Mean Effluent Organics Loadings, FY94-FY06	18
Figure II.B.1	DITP Effluent cBOD (Monthly Average), FY06	20
Figure II.B.2	DITP Effluent cBOD (Weekly Average), FY06	21
Figure II.B.3	DITP Effluent TSS (Monthly Average), FY06	21
Figure II.B.4	DITP Effluent TSS (Weekly Average), FY06	22
Figure II.B.5	DITP Effluent Fecal Coliform (Daily Geometric Mean), FY06	22
Figure II.B.6	DITP Effluent Fecal Coliform (High Sample Counts), FY06	23
Figure II.B.7	DITP Effluent pH (Monthly Min and Max), FY06	23
Figure II.B.8	DITP Effluent Total Chlorine Residual (Monthly Average), FY06	24
Figure II.B.9	DITP Effluent Total Chlorine Residual (Daily Average), FY06	24
Figure II.C.3	Contingency Plan Flowchart	30
Figure III.A.1	Cottage Farm CSO Activations Compared to Precipitation, FY94-FY06	32
Figure III.A.2	Cottage Farm Total Volume Treated Compared to Precipitation, FY94-FY06	33
Figure III.B.1	Prison Point CSO Activations Compared to Precipitation, FY94-FY06	34
Figure III.B.2	Prison Point Total Volume Treated Compared to Precipitation, FY94-FY06	35
Figure III.C.1	Somerville Marginal CSO Activations Compared to Precipitation, FY94-FY06	36
Figure III.C.2	Somerville Marginal Total Volume Treated Compared to Precipitation, FY94-FY06	37
Figure III.D.1	Fox Point CSO Activations Compared to Precipitation, FY94-FY06	38
Figure III.D.2	Fox Point Total Volume Treated Compared to Precipitation, FY94-FY06	38
Figure III.E.1	Commercial Point CSO Activations Compared to Precipitation, FY94-FY06	40
Figure III.E.2	Commercial Point Total Volume Treated Compared to Precipitation, FY94-FY06	40
Figure V.A.1	Choking, FY94-FY06	45
Figure V.A.2	Rain-Related Choking, FY94-FY06	45
Figure V.A.3	Testing/Maintenance Choking, FY94-FY06	46

Executive Summary

Overview

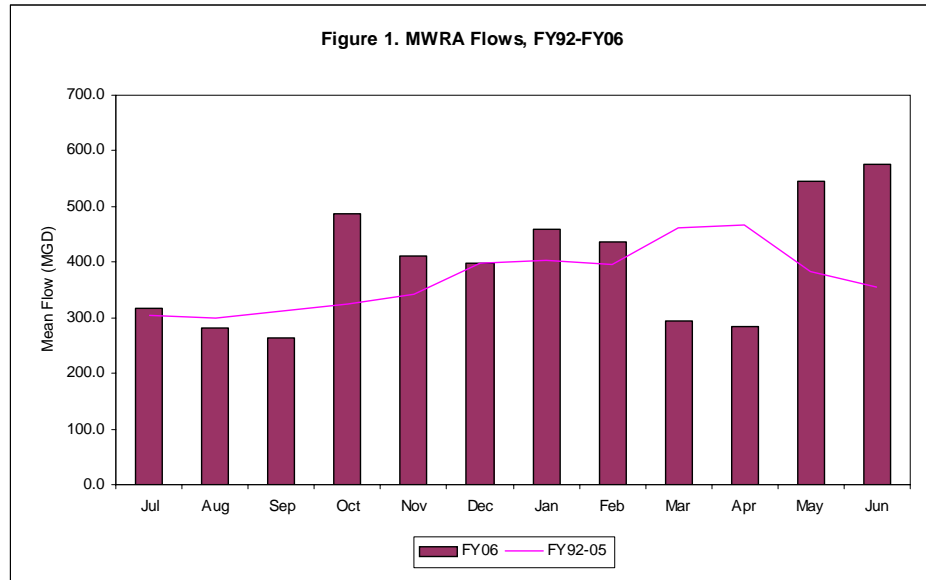
This report presents and summarizes monitoring and compliance data collected and analyzed by the Massachusetts Water Resources Authority's (MWRA) Environmental Quality Department (ENQUAD) from July 1, 2005 to June 30, 2006. This report, while not a regulatory requirement, provides a useful documentation of influent and effluent quality trends over the course of a fiscal year for the MWRA's Deer Island Treatment Plant (DITP) and Combined Sewer Overflow (CSO) facilities.

Deer Island Treatment Plant

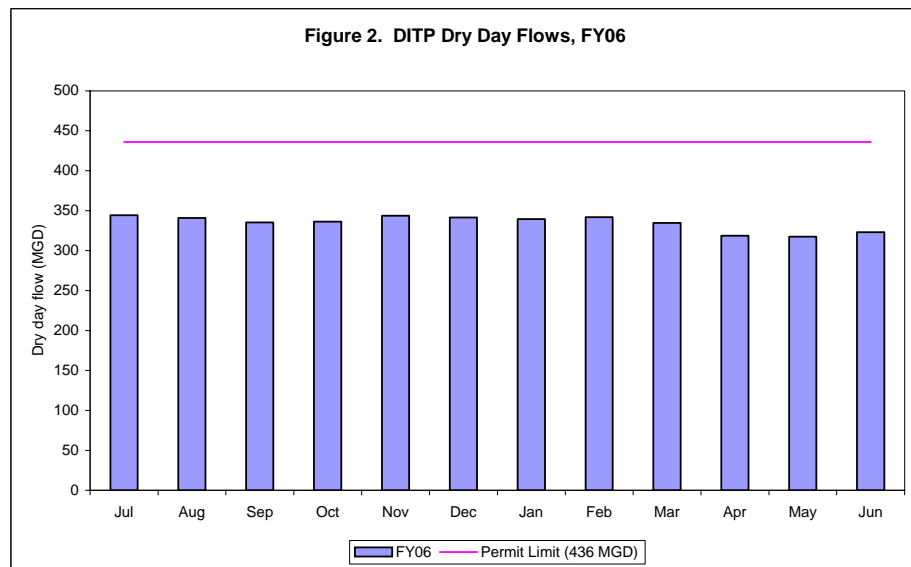
The MWRA's NPDES permit requires the Authority to monitor its wastewater treatment plant at Deer Island for specific parameters. The MWRA currently operates under a permit issued in July 10, 2000 and effective August 9, 2000. The permit calls for secondary treatment of wastewater and monitoring of the effects of the new outfall in the Massachusetts Bay. Secondary treatment began at DITP in August 1997 with the start-up of the first battery of secondary treatment (Battery A). In March 1998, Battery B was brought on-line. The final battery, Battery C, became operational in March 2001. DITP was designed for an average design flow of 361 million gallons a day, a maximum secondary treatment capacity of 710 million gallons a day, and a hydraulic capacity of 1.2 billion gallons a day.

In addition to the completion of secondary treatment facilities, the MWRA opened on September 6, 2000 a new 9.5-mile outfall tunnel that carries treated wastewater from DITP to Massachusetts Bay. The permit requires extensive monitoring of Massachusetts Bay to determine the effects of the outfall, if any exist.

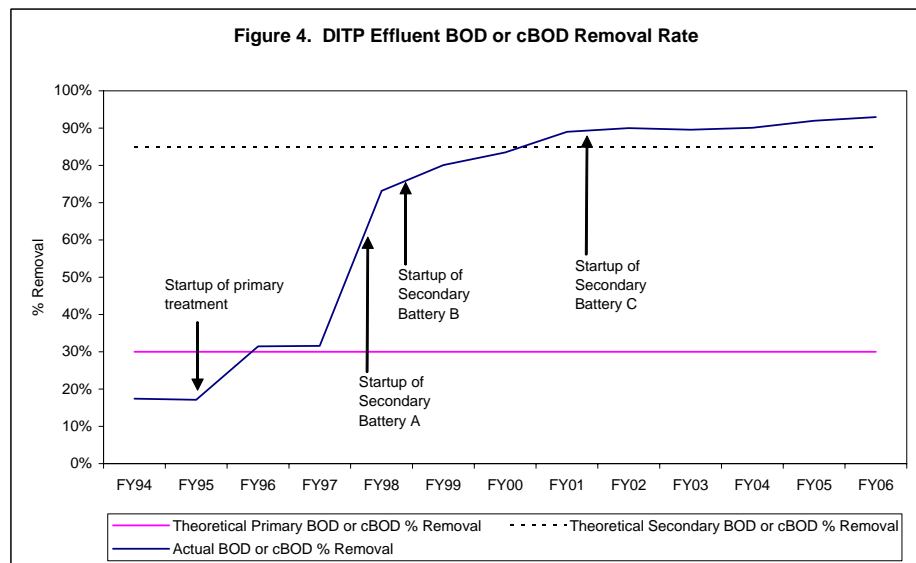
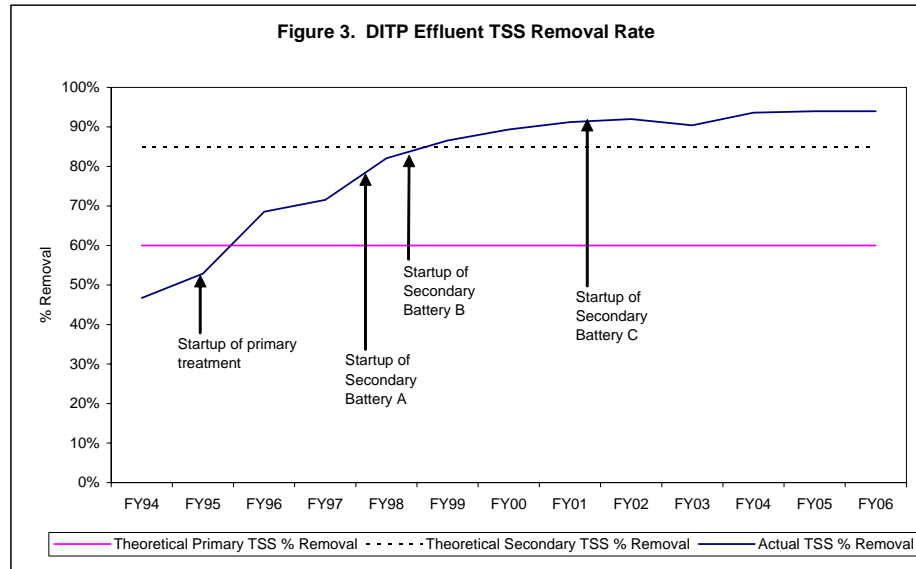
Figure 1, on the following page, shows the Deer Island flow during each month of FY06, comparing the flow with the monthly averages of the previous twelve years – FY92 to FY05. From FY99 to FY02 all flows were treated at Deer Island, while from FY92 to FY98 flows were treated at DITP and the former Nut Island Treatment Plant, now the headworks for South System influent to DITP.



Restrictions on dry day flow are also part of the permit. These restrictions act to control new connections, ensuring that the collection system and the new treatment plant retain adequate capacity. Monthly dry day flows are calculated by averaging the flows on dry days over the previous year. A dry day is defined as a day with 0.09 inches of precipitation or less and no snow melt with the following restrictions: the precipitation on the previous day is less than 0.3 inches, the precipitation two days prior is less than 1.0 inch, and the precipitation three days prior is less than 2.0 inches. A day with snowmelt is defined as a day when there is snow on the ground and the air temperature is above 32°F. Figure 2 shows the dry day flow for Deer Island during each month of FY06. The solid line represents the dry day flow limit of 436 mgd for the permit. In FY06, no violations of the dry day flow limit occurred.

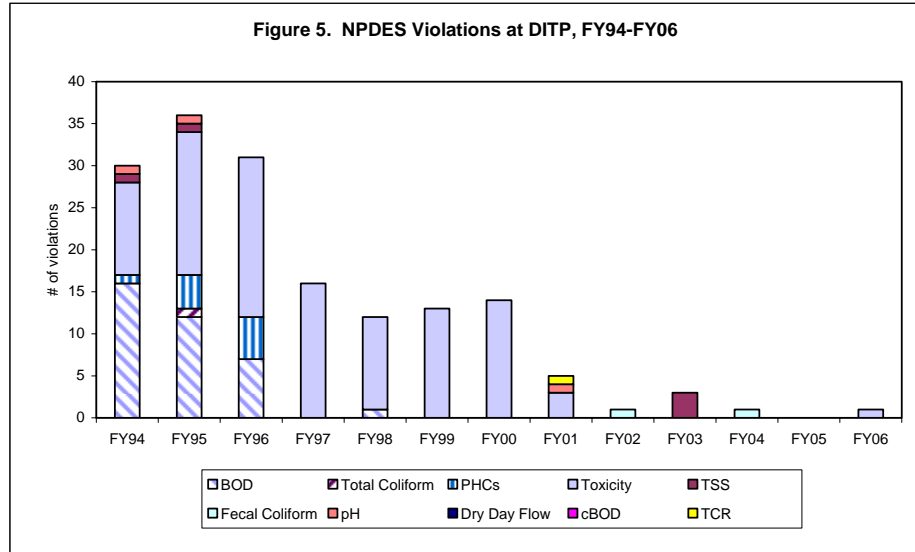


Since the new primary treatment plant came on-line on January 21, 1995, appreciable improvements have been seen in effluent quality. The removal rates for both TSS and BOD or cBOD (cBOD has replaced BOD in the current permit as the measure of oxygen demand) have improved significantly (see Figures 3 and 4, respectively on the following page). In FY96 and FY97, removal efficiencies compared favorably to theoretical removal efficiencies for primary treatment. In FY98, efficiencies continued to improve, especially for BOD, with a removal rate well above the theoretical range.¹ This coincided with the start-up of Batteries A and B of secondary treatment. Since FY00, removal rates for both TSS and cBOD have essentially leveled off as DITP has reached its optimal efficiency level.



¹ Metcalf & Eddy, Inc. 1972. *Wastewater Engineering: Collection, Treatment, Disposal*. New York: McGraw-Hill Book Company. p. 446.

Annual numbers of NPDES violations have decreased dramatically due to improved treatment at DITP. Figure 5 compares the number of NPDES permit violations at Deer Island in FY06 to previous years. No non-toxicity NPDES violations occurred in FY06, FY05, FY00, FY99, or FY97. One non-toxicity violation occurred in FY02 and FY98, three in FY03, and four in FY01, compared to 12 in FY96 and 19 in both FY95 and FY94. In FY06, there was one toxicity violation at DITP.

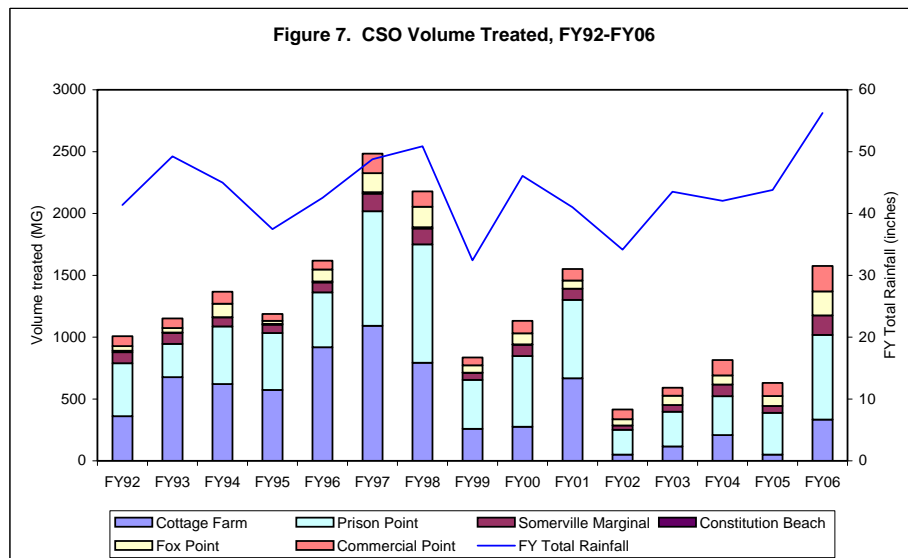
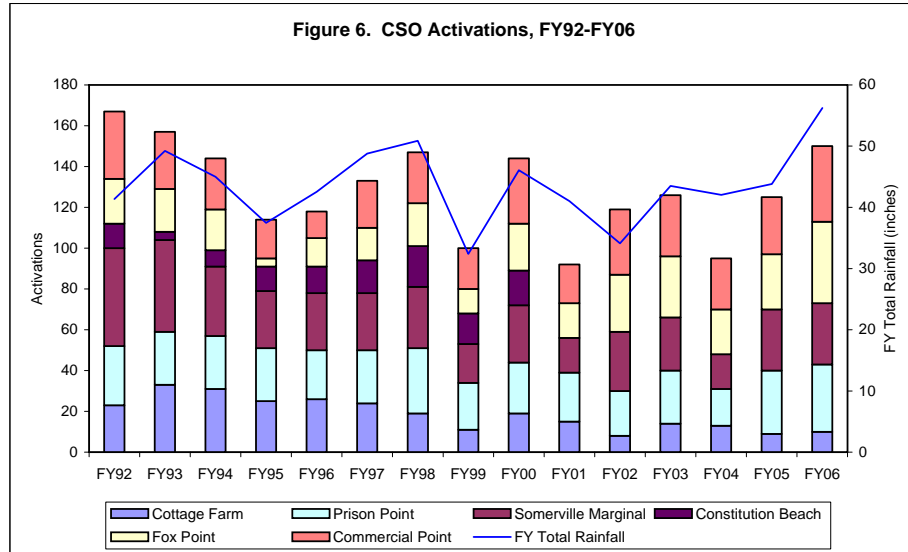


Since the opening of the new plant, Deer Island has seen significant reductions in loadings of metals and organic compounds in the effluent – see Chapter 2 for more details. These improvements are probably due to two factors: first, corrosion control activities and source reduction programs have helped to lower these pollutants in the incoming influent. Second, the new plant is able to better capture both metals and organics in the treatment process.

Combined Sewer Overflow Facilities

MWRA monitors five CSO facilities – Cottage Farm, Prison Point, Somerville Marginal, Fox Point, and Commercial Point – under the permit. The Constitution Beach facility is also included under the permit. However, MWRA decommissioned the Constitution Beach facility in September 2000 following the completion of a sewer separation project in East Boston.

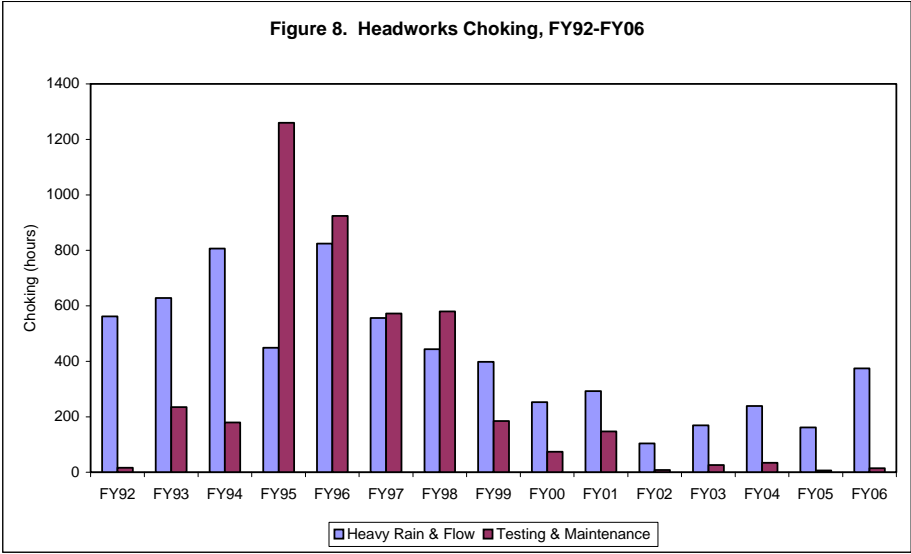
Figures 6 and 7 on the next page show the number of activations and the total volume treated, respectively, at the six CSO facilities since FY92. The correlation between rainfall and CSO activation can be seen in both figures. Note that although total rainfall is correlated to CSO activations, the intensity of the rainfall and frequency of storms will have an important effect. These characteristics influence the degree of ground saturation, affecting the volume treated at the CSO facilities during a storm.



Collection and Transport System

The MWRA monitors the capacity of the wastewater collection and transport system. One of the system capacity parameters in the North System is choking, which occurs at the remote headworks. Choking is a reduction or stopping of flow to Deer Island at the remote headworks, either when heavy flow exceeds the capacity of the treatment plant or when maintenance or system upgrades are performed at the plant.

As Figure 8 on the following page shows, the number of hours of choking has fallen to very low levels since FY01, mainly due to the completion of the Deer Island plant. To minimize choking related to testing and maintenance, MWRA performs maintenance and testing at off-peak times so not to cause any backups in the system upstream of the headworks.



The MWRA also monitors the occurrence of Sanitary Sewer Overflows, or SSOs, associated with MWRA-owned sewer lines. These overflows occur in areas where the collection system becomes overloaded by heavy flows. In FY95, the MWRA’s Transport Department started to locate and visually monitor these SSOs in the North and South Systems. Table 1, on the following page, lists the SSOs observed by MWRA personnel in FY06.

Table 1. Sanitary Sewer Overflows, FY06	
Location	Number of Overflows
North System	
Alewife Brook Pump Station, Station 0+35	1
Section B, Station 31+00, Cambridge (Rt. 2 exit ramp)	1
Section B Cambridge (siphon)	1
Section C, Station 00+35, Medford (chamber)	3
Section C, Station 00+35, Medford (headhouse)	2
Section 15 Chelsea (Second St.)	1
Section 19, Station 4+24, Medford (headhouse)	1
Section 40 Malden (Charles St.)	1
Section 43.5, Station 9+12, Arlington (headhouse)	1
Section 44.5, Station 53+54, Winchester (manhole)	1
Section 51, Station 21+20, Melrose (manhole)	1
Section 51, Station 10+75, Melrose (manhole)	1
Section 91A Medford (manhole)	1
Section 91B, Station 31+24, Medford (headhouse)	2
Section 91B, Station 56+54, Arlington (manhole)	1
Section 107, Station 1+00, Mystic Valley Parkway	1
Section 107 Medford (siphon)	2
Section 113, Station 3+24, Winchester (siphon)	1
Section 113, Station 2+06, Winchester (siphon)	1
Section 222, Station 96+68 (manhole)	1
Section 222, Station 92+74 (manhole)	1
South System	
Station 3+15, Nut Island Headworks (emergency outfalls)	1
Station 0+40, Nut Island Headworks (spillway)	1
Section 570, Station 10+89, West Roxbury (north gates)	3
Section 570, Station 10+89, West Roxbury (south gates)	3
Section 626, Station 54+06, Weymouth (Smelt Brook)	3
Section 628 Braintree (Pearl St.)	3
Section 628A, Station 85+14, Randolph (headhouse siphon)	1

Future Outlook

The startup of the new primary treatment plant at Deer Island in FY95 was just the first of several changes and improvements in the MWRA's facilities, including full secondary treatment, the Inter-Island Tunnel linking the South System to DITP, and the new outfall tunnel to Massachusetts Bay. The MWRA no longer discharges effluent into Boston Harbor and the Authority is currently monitoring the effects of these changes on water quality in the Harbor and Massachusetts Bay, as required by the NPDES permit issued in July 2000. In addition, a contingency plan ensures that the discharge does not adversely impact Massachusetts Bay.

Starting in April 2005, digested sludge was sent to the MWRA's Fore River facility via the Inter-Island Tunnel, eliminating the need to centrifuge the sludge at DITP. Eliminating this step has stopped the return of sludge centrate to the head of the plant, enabling better process control in the secondary treatment plant.

In March 2006, as a result of the sludge transfer noted above, the secondary process limit was raised from 630 to 660 million gallons per day. In June 2006, the limit was further raised to 710 million gallons per day. Studies are underway to determine whether flows as high as 780 million gallons per day are sustainable with no adverse impacts on secondary treatment.

Major upgrades are finished at the five CSO facilities, and construction of a sixth facility, Union Park, will be completed in early 2006. Several upgrades were also finished at the Quincy, Braintree-Weymouth, and Squantum pump stations in 2002, 2002, and 2003, respectively. Finally, the Intermediate Pump Station was brought on-line in 2004, increasing pumping capacity to DITP. This increased capacity should reduce sanitary sewer overflows to Smelt Brook. Taken as a whole, these upgrades have modernized MWRA facilities and reduced pollutants discharged to receiving waters.

I: Introduction

Overview

This report presents and summarizes the NPDES monitoring and compliance data compiled and analyzed by the MWRA Environmental Quality Department during the period of July 2005 to June 2006. MWRA's DITP and CSO facilities serve large communities' needs for sewer systems while maintaining healthy water environments for recreation and wildlife.

Chapter II presents and discusses the monitoring results for DITP, along with Contingency Plan and Ambient Monitoring Plan requirements. Chapter III describes the results for the five CSO facilities. Chapter IV discusses sludge processing operations at DITP and the MWRA's Fore River pelletizing facility. Chapter V discusses transport and sewer system capacity issues. Finally, Chapter VI covers an array of miscellaneous topics introduced by the new permit. Appendices A-F provide detailed monthly data for the Deer Island plants and for the five CSO facilities. Appendix G provides background information about MWRA's regulatory requirements, and Appendix H describes the MWRA sewer system and facilities. Appendix I defines the types of detection limits encountered in chemical analyses. Appendix J lists pollutants of concern. Finally, Appendix K is a glossary of the terms and phrases used throughout this report.

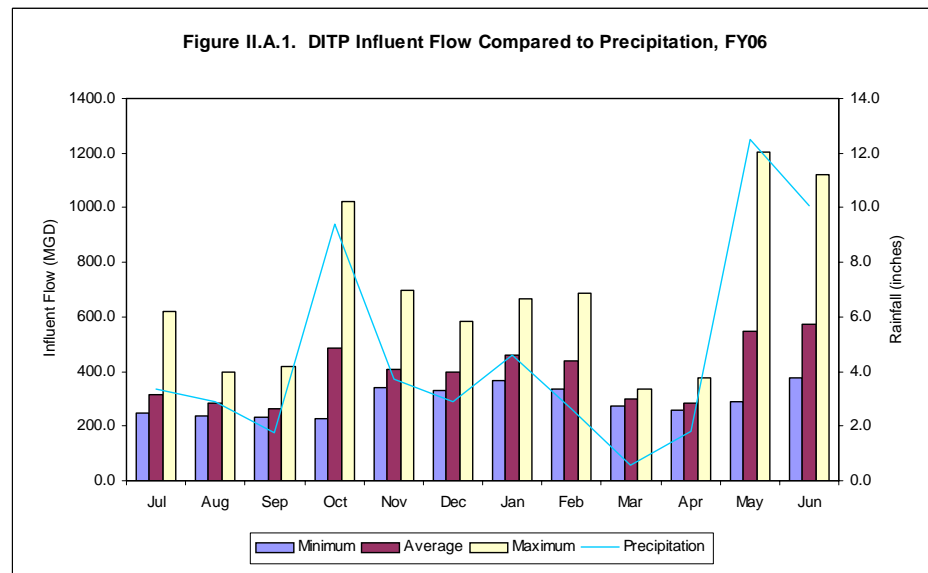
II: Deer Island Treatment Plant

Overview

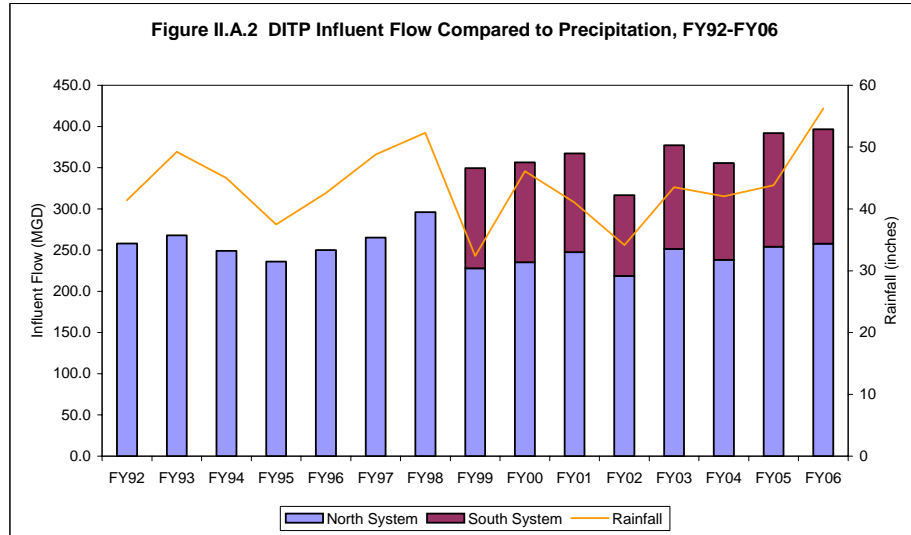
This chapter presents and discusses monitoring information for DITP. The characteristics examined include flow, conventional parameters, nutrients, priority pollutants (metals, cyanide, pesticides/PCBs, and organic compounds), fecal coliform bacteria, and whole effluent toxicity. Since a number of limits in the Contingency Plan set forth by the new NPDES permit deal with effluent quality, this section finishes up with a description of the Contingency Plan and the closely related Ambient Monitoring Plan.

II.A.1 Influent Flow

The average flow to DITP in FY06 was 396.5 million gallons per day (mgd). Figure II.A.1 shows that flow generally rises and falls with the amount of precipitation. This occurs because several of the larger communities in the North System (Boston, Cambridge, Somerville, and Chelsea) have combined sewers.



The impact of rainfall on flows can also be seen in Figure II.A.2 on the following page, which tracks average flow and precipitation over the past twelve fiscal years. The completion of the Inter-Island Tunnel from Nut Island to Deer Island in early FY99 resulted in increased flow to DITP, as DITP treated South System sewage previously treated at the Nut Island Treatment Plant. An increase in rain in FY06 (56.23 inches versus 43.81 inches in FY05) may have led to the slightly higher average flows to DITP in the past fiscal year. Higher average flows may also be a result of continuing sewer separation projects and greater capture of combined sewer overflows. Both of these factors would result in greater pumping to DITP.



**II.A.2
Influent
Conventional
Parameters
and Nutrients**

As Table II.A.1 indicates, Deer Island influent in FY06 can be classified as weak/medium.¹

Parameter	Value	Weak	Medium	Strong
TSS (mg/L)	171	100	200	350
TKN (mg/L)	32.5	20	40	85
Ammonia (mg/L)	23.0	12	25	50

A summary of Deer Island influent characteristics from FY94-FY06 is provided in Table II.A.2 on page 12. Note that cBOD only became a measured parameter with the debut of the new NPDES permit in August 2000, so no historical data is available previous to FY01.

¹Metcalf & Eddy, Inc. 1972. *Wastewater Engineering: Collection, Treatment, Disposal*. New York: McGraw-Hill Book Company, p. 231.

Table II.A.2. Deer Island Influent Characterization, FY94-FY06													
Parameter	FY94*	FY95*	FY96*	FY97*	FY98*	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Flow (mgd)													
Minimum	171	167	147	167	159	233	219	260	222.7	237.6	247	243	229.5
Average	249	236	250	265	296	350	356	367	316.6	378	356	392	396.5
Maximum	528	565	526	649	917	824	901	1136	773	897.4	1132	871	1203
Total Suspended Solids (TSS)													
Min Conc (mg/L)	93	102	56	50	32	43	86	63	157	140	129	145	124
Avg Conc (mg/L)	137	138	140	144	141	160	167	176	200	188	234	237	171
Max Conc (mg/L)	175	160	432	284	382	564	379	336	255	230	281	329	224
Average Loading (tons/d)	98	96	86	100	94	234	248	269	264	296	347	387	283
Carbonaceous Biochemical Oxygen Demand (cBOD)													
Min Conc (mg/L)	**	**	**	**	**	**	**	29	93	80	75	86	65
Avg Conc (mg/L)	**	**	**	**	**	**	**	111	124	106	126	118	99
Max Conc (mg/L)	**	**	**	**	**	**	**	242	162	131	146	141	132
Average Loading (tons/d)	**	**	**	**	**	**	**	170	164	167	187	193	164
Settleable Solids													
Min Conc (mL/L)	1.9	3.5	0.1	1.5	0.1	0.1	0.7	0.3	4.5	4.7	3.6	5.3	3.9
Avg Conc (mL/L)	3.9	5.6	7.0	6.9	6.3	5.9	5.3	5.8	6.5	7.4	9.2	10.2	6.4
Max Conc (mL/L)	5.6	7.3	18.0	17.0	20.0	34.2	24.6	15.5	9.5	11.1	14.0	16.7	8.8
Average Loading (tons/d)	2.8	3.9	4.3	4.8	4.2	8.6	7.9	8.9	8.6	11.7	13.7	16.7	10.6
Total Kjeldahl Nitrogen													
Min Conc (mg/L)	11.2	14.0	11.6	8.7	13.6	14.6	13.2	16.3	26.0	23.3	18.7	21.7	20.5
Avg Conc (mg/L)	21.9	21.9	26.3	24.2	26.4	29.2	27.7	30.1	35.2	29.3	31.0	31.6	32.5
Max Conc (mg/L)	29.3	29.1	56.3	48.1	37.7	45.6	46.5	46.5	44.5	38.1	37.0	39.4	44.8
Average Loading (tons/d)	15.6	15.2	16.1	16.9	17.4	42.7	41.1	46.1	46.5	46.2	46.0	51.7	53.7
Ammonia-Nitrogen													
Min Conc (mg/L)	5.6	7.3	6.8	2.5	4.8	6.0	6.1	6.8	14.2	12.4	10.8	13.8	13.7
Avg Conc (mg/L)	12.3	13.7	15.0	13.3	14.5	16.6	16.3	17.8	20.5	17.0	19.0	19.6	23.0
Max Conc (mg/L)	17.9	18.0	24.0	18.6	23.1	30.8	25.0	24.2	28.6	23.7	22.7	25.7	31.3
Average Loading (tons/d)	8.8	9.6	9.2	9.2	9.6	24.2	24.2	27.2	27.1	26.8	28.2	32.0	38.0
Nitrates													
Min Conc (mg/L)	0.10	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Avg Conc (mg/L)	0.80	0.15	0.14	0.22	0.36	0.06	0.13	0.17	0.05	0.10	0.13	0.16	0.13
Max Conc (mg/L)	2.70	0.59	1.42	2.31	1.95	1.21	1.56	1.53	0.26	0.37	0.81	0.7	0.54
Average Loading (tons/d)	0.57	0.10	0.09	0.15	0.24	0.09	0.19	0.26	0.07	0.16	0.19	0.26	0.21
Nitrites													
Min Conc (mg/L)	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.07	0.01	0.01	0.01
Avg Conc (mg/L)	0.10	0.06	0.07	0.09	0.08	0.05	0.14	0.15	0.11	0.22	0.13	0.23	0.19
Max Conc (mg/L)	0.20	0.19	1.66	0.35	0.46	0.45	0.72	0.47	0.35	0.55	0.41	0.62	0.72
Average Loading (tons/d)	0.07	0.04	0.04	0.07	0.05	0.07	0.21	0.23	0.15	0.35	0.19	0.38	0.31

* North System only. FY99 and later include South System data. ** Samples not collected.

II.A.3 Influent Priority Pollutants

The results of a complete priority pollutant scan of Deer Island influent can be found in Tables A-2 and A-3 of Appendix A. For levels below detection limits, one half of the method detection limit for inorganic compounds or one tenth of the quantitation limit for organic compounds was substituted to calculate concentrations and loadings. Appendix I provides a detailed discussion of detection and quantitation limits.

A pollutant is included whether it was detected just once or 37 times over the course of a year. Figures II.A.3 and II.A.4 below show annual averages of the daily loads; however, they do not truly reflect how often the pollutant was detected during the year. Therefore, if a below detection limit concentration is converted to a loading, it is recorded as a non-zero value, even though the constituent may not have been present in the sample. Note that these caveats apply to both metals and organics loadings. However, since metals are commonly detected in almost every sample, the notes raised above are less of an issue.

Figure II.A.3 compares FY06 average influent loadings for several key metals to historical values. The MWRA samples for these pollutants a few times a month. Using the measured concentration and the flow on the day on which the sample was taken, daily loads can be calculated. Data from FY98 and earlier is from the North System only.

Before 1999, metals loadings in the North System decreased steadily, as MWRA made strides in toxic and corrosion control efforts involving both water supply and wastewater transport.

Since the South System flow was transferred from Nut Island to Deer Island at the start of FY99, the data after FY99 includes the South System flow. This larger, combined flow explains the increase in metals loadings from FY92-98 to FY99-06. Since loadings are calculated using flow, which in turn is affected by rainfall, loadings can rise and fall with rainfall amounts.

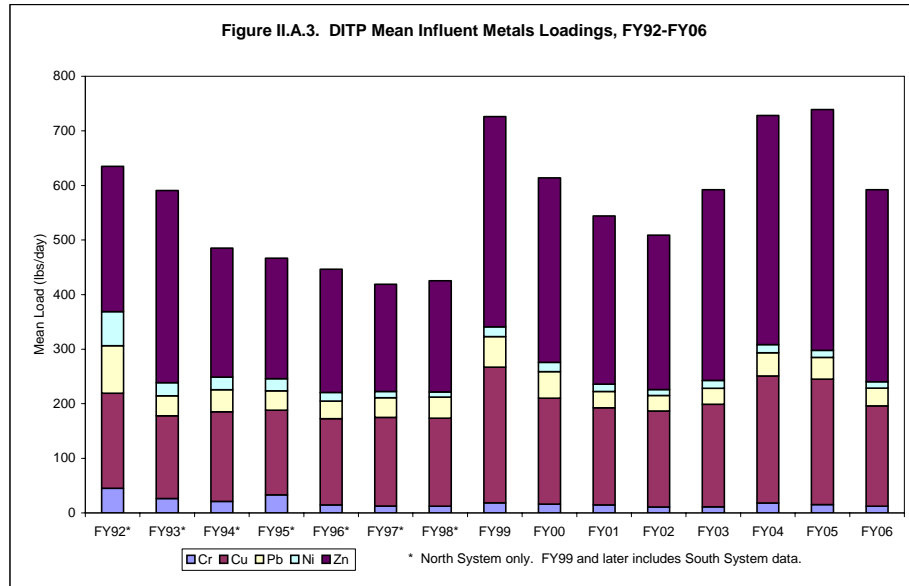
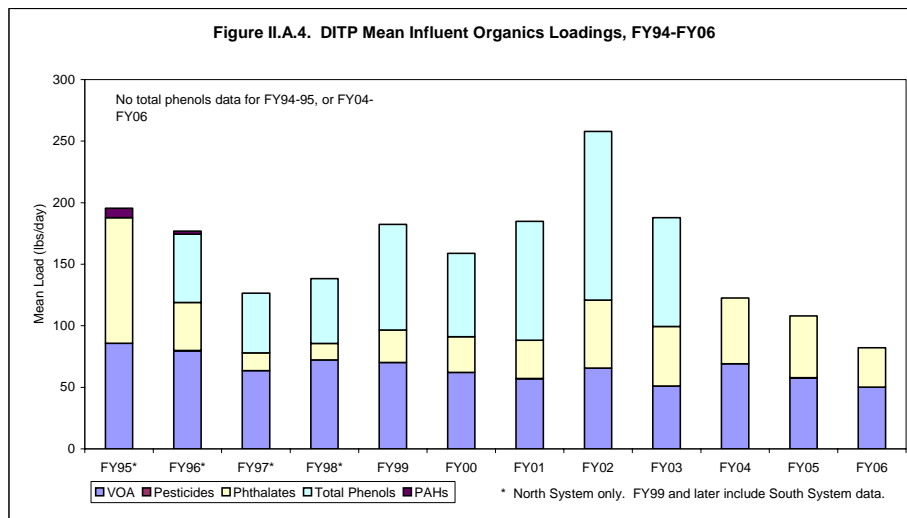


Figure II.A.4 on the following page compares influent loadings of certain representative organic priority pollutants to the loadings in previous years (see Appendix A, Table A-3). The opening of the Inter-Island Tunnel in FY99 had an identical effect on organics loadings at Deer Island as it did on metals loadings; they increased due to the added flow from the South System.



**II.A.4
Effluent
Conventional
Parameters
and Nutrients**

Table II.A.3 compares DITP’s removal efficiencies for TSS and cBOD with theoretical removal efficiencies.² The removal efficiencies are determined from the average effluent and influent concentrations for TSS and cBOD as reported in Table A-1 of Appendix A.

Parameter	DITP % Removal*	Theoretical % Removal for Secondary Treatment
TSS	94%	85%
cBOD	93%	85%

* Removal efficiencies were determined using the average influent and effluent concentration values as reported in Table A-1, Appendix A. Note that only a portion of the total flow each month went through secondary treatment. See Table II.A.4 for more information.

Table II.A.4, on the next page, shows how degree of secondary treatment can affect TSS and cBOD removal efficiencies. The table lists TSS and cBOD removal efficiencies and the percentage of flow that received secondary treatment on a monthly basis. The degree of secondary treatment is the average flow through secondary treatment (mgd) during the month divided by the average plant flow (mgd) for that month.

For the fiscal year, 96% of DITP flow went through secondary treatment and removal efficiency for TSS was 94%. For cBOD, the plant achieved 93% removal efficiency.

²Metcalf & Eddy, Inc. 1972. *Wastewater Engineering Collection, Treatment, Disposal*. New York. McGraw-Hill Book Company, p. 446.

Table II.A.4. Removal Efficiency vs. Degree of Secondary Treatment, FY06			
	TSS Removal Efficiency	cBOD Removal Efficiency	% of Flow Treated at Secondary Levels
July	96%	95%	97.9%
August	96%	96%	99.2%
September	96%	95%	99.5%
October	94%	93%	86.3%
November	94%	92%	97.8%
December	94%	93%	99.2%
January	92%	91%	98.9%
February	94%	92%	98.4%
March	96%	93%	100.0%
April	96%	95%	99.9%
May	92%	90%	87.0%
June	93%	90%	91.9%
Average	94.3%	93.0%	96.3%

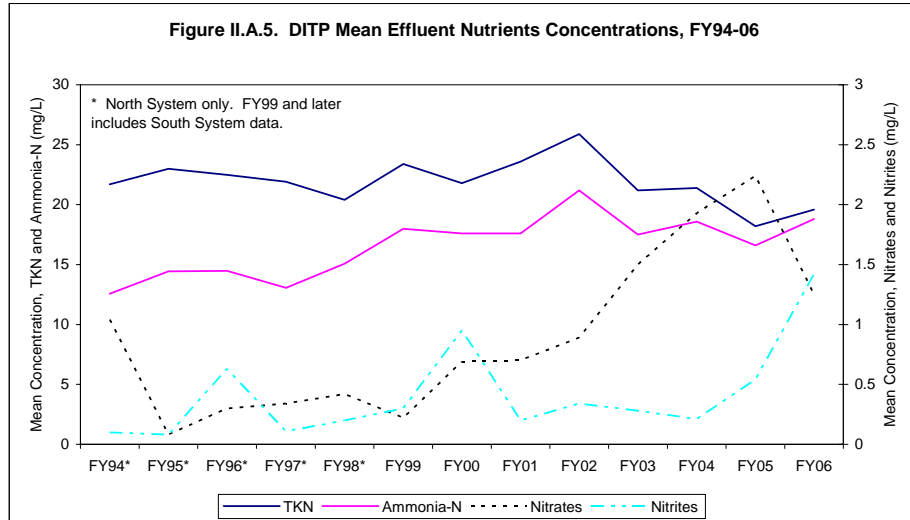
Table II.A.5 (next page) summarizes the conventional parameters and nutrients in Deer Island effluent over the past nine years. The significant drop in several parameters that occurred between FY95 and FY96 is due to the improved removal efficiency of the primary treatment plant. The implementation of secondary treatment in FY98 can explain the drop in TSS and BOD concentrations since FY97. Secondary treatment is also responsible for the increase in ammonia concentrations over the same period.

Table II.A.5. Deer Island Effluent Characterization, FY94-FY06													
Parameter	FY94*	FY95*	FY96*	FY97*	FY98*	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Flow (mgd)													
Minimum	171	167	147	167	159	237	219	260	222	238	246	243	229.4
Average	249	236	250	265	296	350	356	367	317	377	356	392	396
Maximum	528	565	526	649	917	757	900	1136	773	898	1132	871	1203
Total Suspended Solids (TSS)													
Min Conc (mg/L)	65	52	17	16	4	3	5	4	3	5	5	5	5
Avg Conc (mg/L)	73	65	44	41	25	22	18	15	16	18	17	15	9
Max Conc (mg/L)	86	90	136	100	140	69	62	47	43	132	78	62	61
Average Loading (tons/d)	52	45	27	29	17	14	26	24	21	28	25	25	16
Carbonaceous Biochemical Oxygen Demand (cBOD)													
Min Conc (mg/L)	**	**	**	**	**	**	**	4	3	3	3	2	2
Avg Conc (mg/L)	**	**	**	**	**	**	**	12	13	11	12	10	7
Max Conc (mg/L)	**	**	**	**	**	**	**	36	40	40	50	38	66
Average Loading (tons/d)	**	**	**	**	**	**	**	19	17	17	18	16	11
Settleable Solids													
Min Conc (mL/L)	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Avg Conc (mL/L)	0.5	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Max Conc (mL/L)	0.9	0.7	2.0	1.6	7.0	3.0	3.1	1.9	3.0	3.0	6.0	1.2	1.0
Average Loading (tons/d)	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2
Total Kjeldahl Nitrogen													
Min Conc (mg/L)	12.8	13.7	10.6	10.9	9.1	11.2	8.2	12.2	15.1	9.7	11.0	6.6	5.8
Avg Conc (mg/L)	21.7	23.0	22.5	21.9	20.4	23.4	21.8	23.6	25.9	21.2	21.4	18.2	19.6
Max Conc (mg/L)	32.8	28.6	32.5	27.6	32.4	34.3	32.4	33.3	35.0	32.3	33.3	30.9	35.3
Average Loading (tons/d)	22.5	22.6	23.4	24.3	25.2	34.2	32.4	36.1	34.2	33.3	31.8	29.8	32.4
Ammonia-Nitrogen													
Min Conc (mg/L)	6.1	7.3	5.6	4.4	3.5	5.4	5.0	5.1	9.4	7.0	7.5	4.5	4.6
Avg Conc (mg/L)	12.6	14.4	14.5	13.1	15.1	18.0	17.6	17.6	21.2	17.5	18.6	16.6	18.8
Max Conc (mg/L)	18.5	19.6	21.9	18.0	22.7	26.4	25.2	24.9	32.0	28.0	28.0	28.7	45.2
Average Loading (tons/d)	9.0	10.0	8.9	9.1	10.0	11.9	26.2	27.0	28.0	27.5	27.6	27.1	31.0
Nitrates													
Min Conc (mg/L)	0.13	0.03	0.01	0.01	0.01	0.01	0.00	0.0	0.01	0.01	0.01	0.01	0.02
Avg Conc (mg/L)	1.04	0.08	0.30	0.34	0.42	0.22	0.69	0.7	0.89	1.50	1.93	2.24	1.25
Max Conc (mg/L)	5.98	0.28	1.95	2.58	1.49	1.93	2.96	4.2	2.86	5.07	3.88	5.77	4.8
Average Loading (tons/d)	0.74	0.06	0.18	0.23	0.28	0.15	1.03	1.1	1.2	2.4	2.9	3.7	2.1
Nitrites													
Min Conc (mg/L)	0.01	0.02	0.01	0.01	0.01	0.01	0.04	0.0	0.01	0.01	0.01	0.03	0.27
Avg Conc (mg/L)	0.10	0.08	0.63	0.11	0.20	0.30	0.95	0.2	0.34	0.28	0.21	0.54	1.42
Max Conc (mg/L)	0.26	0.22	1.90	0.62	1.15	1.99	3.06	1.1	1.26	0.91	0.69	0.71	2.74
Average Loading (tons/d)	0.07	0.06	0.39	0.08	0.13	0.20	1.41	0.3	0.4	0.4	0.3	0.9	2.3

* North System only. FY99 and later include South System data. ** Samples not collected.

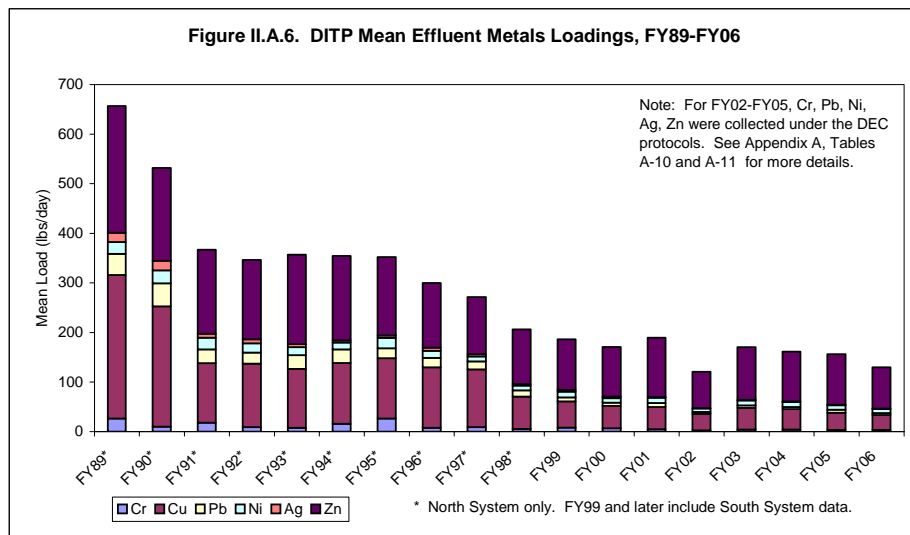
A summary of nutrient concentrations in Deer Island effluent from FY94-FY06 is provided in Figure II.A.5 on the following page. The introduction of the new primary treatment plant in FY95 did not affect nutrient concentrations, as primary treatment has no effect on nutrients.

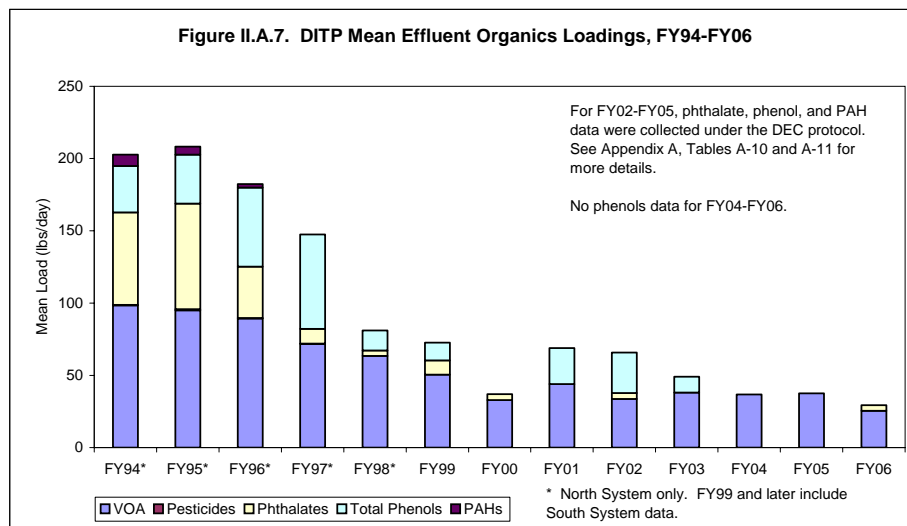
However, the activated sludge process used in DITP's secondary treatment does change nutrient concentrations. The activated sludge process uses bacteria to promote efficient and rapid breakdown of wastes. This bacterial breakdown results in changes in the proportions of nitrogen species. For example, total Kjeldahl nitrogen (TKN) consists of NH₃-N plus organic nitrogen. Effluent NH₃-N concentrations have risen while total Kjeldahl nitrogen (TKN) concentrations have remained relatively stable. Therefore, the proportion of NH₃-N as a TKN component has increased. Elevated levels of NH₃-N are characteristic of the activated sludge process.



**II.A.5
Effluent
Priority
Pollutants**

Appendix A, Tables A-8 and A-9 provide a summary of priority pollutant concentrations and loadings in DITP effluent for FY06. For a discussion of the importance of detection limits in loading calculations, see Section II.A.3 and Appendix I. Metals loadings over the past fifteen years are summarized in Figure II.A.6, while Figure II.A.7 on page 16 graphs organic pollutants from FY94-FY06. Two factors may explain the long-term decrease in loadings. First, the MWRA has instituted a more aggressive industrial pre-treatment program coupled with stricter enforcement of local limits. Second, the decrease may also be attributed to better capture of metals and organics at the plant.





II.A.6 Whole Effluent Toxicity

The MWRA tests effluent toxicity every month at DITP. Effluent toxicity provides an overall view of effluent quality, ensuring that the effluent does not adversely affect the environment. In 1989, the EPA found that surfactants were the probable cause of most acute toxicity in DITP's effluent. Surfactants are most commonly used in household detergents to improve cleansing power. No acute toxicity could be attributed to metals or pesticides.

The MWRA permit requires four tests for effluent toxicity testing. 48-hr acute static toxicity tests using the mysid shrimp (*Americamysis bahia*) and the silversides fish (*Menidia beryllina*) measure the short-term lethal effects caused by the effluent. A chronic survival and growth test using *Menidia* and a chronic fertilization test using the sea urchin (*Arbacia punctulata*) both measure subtle toxic impacts over a longer period of time. The results of these tests for FY06 can be found in Table II.A.6 on the following page.

The LC₅₀ (Lethal Concentration 50%) is the concentration of effluent in a sample that causes mortality to 50% of the test population during the duration of the test. The two acute tests use LC₅₀.

The NOEC (No Observed Effect Concentration) used in the chronic tests is the concentration of effluent in a sample to which organisms are exposed in a life cycle or partial life cycle test that has no adverse effects. An NOEC limit of 1.5% means that 1.5% of the sample is effluent, and the remainder dilution water. Any acute LC₅₀ below 50% or chronic NOEC below 1.5% would violate the NPDES limit.

	<i>Mysid</i> acute LC50	<i>Menidia</i> acute LC50	<i>Arbacia</i> chronic NOEC	<i>Menidia</i> chronic NOEC
Limits (%)	50	50	1.5	1.5
July	> 100	> 100	100	50
August	> 100	62.25	100	25
September	> 100	64.2	< 1.5	25
October	> 100	> 100	50	50
November	> 100	> 100	*	50
December	> 100	> 100	*	1.5
January	> 100	> 100	50	25
February	> 100	> 100	50	6.25
March	> 100	> 100	50	6.25
April	> 100	70.7	50	50
May	> 100	> 100	50	50
June	> 100	> 100	100	50
# of Violations	0	0	1	0

Results in **bold** indicate a violation of the regulatory limits. * indicates an invalid test.

**II.B.1
Compliance
with
Regulatory
Limits**

Plant performance at Deer Island is compared to permit limits in Table II.B.1 and Figures II.B.1 through II.B.9 on the following pages. There was one permit violation in FY06, of *Arbacia* chronic toxicity.

The failed *Arbacia* test occurred in September 2005. Of the four tests done that month, only the *Arbacia* test failed. A follow-up test passed, and there were no other suspicious effluent samples collected in that time period, so it is unknown exactly why that particular test failed.

Parameter	Permit Limits	Range of Values Exceeding Limits	Number of Violations
Carbonaceous Biochemical Oxygen Demand (mg/L)			
Monthly Avg	25	n/a	0
Weekly Avg	40	n/a	0
Total Suspended Solids (mg/L)			
Monthly Avg	30	n/a	0
Weekly Avg	45	n/a	0
Total Chlorine Residual (ug/L)			
Monthly Avg	456	n/a	0
Daily Maximum	631	n/a	0
Fecal Coliform			
Daily Geometric Mean (col/100mL)	14,000	n/a	0
% of Samples > 14000	10	n/a	0
Consecutive Samples > 14000	3	n/a	0
pH (SU)	6.0-9.0	n/a	0
PCB, Aroclors (ug/L)	0.000045	n/a	0
Acute Toxicity			
<i>Mysid</i> Shrimp (%)	>=50	n/a	0
Inland Silverside (%)	>=50	n/a	0
Chronic Toxicity			
Inland Silverside (%)	>=1.5	n/a	0
Sea Urchin (%)	>=1.5	< 1.5	1
Dry Day Flow (MGD)	436	n/a	0
Total Number of Violations			1

Table II.B.2 compares the number of NPDES violations in FY06 to previous years.

Table II.B.2. NPDES Violations at Deer Island, FY94-FY06													
	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Dry Day Flow	*	*	*	*	*	*	*	0	0	0	0	0	0
BOD	16	12	7	0	1	0	0	*	*	*	*	*	*
cBOD	*	*	*	*	*	*	*	0	0	0	0	0	0
TSS	1	1	0	0	0	0	0	0	0	3	0	0	0
TCR	*	*	*	*	*	*	*	1	0	0	0	0	0
Settleable Solids	0	0	0	0	0	0	0	*	*	*	*	*	*
Fecal Coliform	0	0	0	0	0	0	0	0	1	0	1	0	0
Total Coliform	0	1	0	0	0	0	0	*	*	*	*	*	*
pH	1	1	0	0	0	0	0	1	0	0	0	0	0
PHCs	1	4	5	0	0	0	0	*	*	*	*	*	*
Toxicity	11	17	19	16	11	13	14	3	0	0	0	0	1
Non-Toxicity Violations	19	19	12	0	1	0	0	2	1	3	1	0	0
Total Violations	30	36	31	16	12	13	14	5	1	3	1	0	1

* Not a permit limit at that particular time

The following pages track trends in effluent over FY06. All of the effluent parameters were well under permit limits.

For carbonaceous biochemical oxygen demand (cBOD) and total suspended solids (TSS), the permit limits monthly and weekly average concentrations. Figure II.B.1 shows that the monthly averages for cBOD never exceeded the regulatory discharge limit of 25 mg/L, and are well below the 5-year historical average.

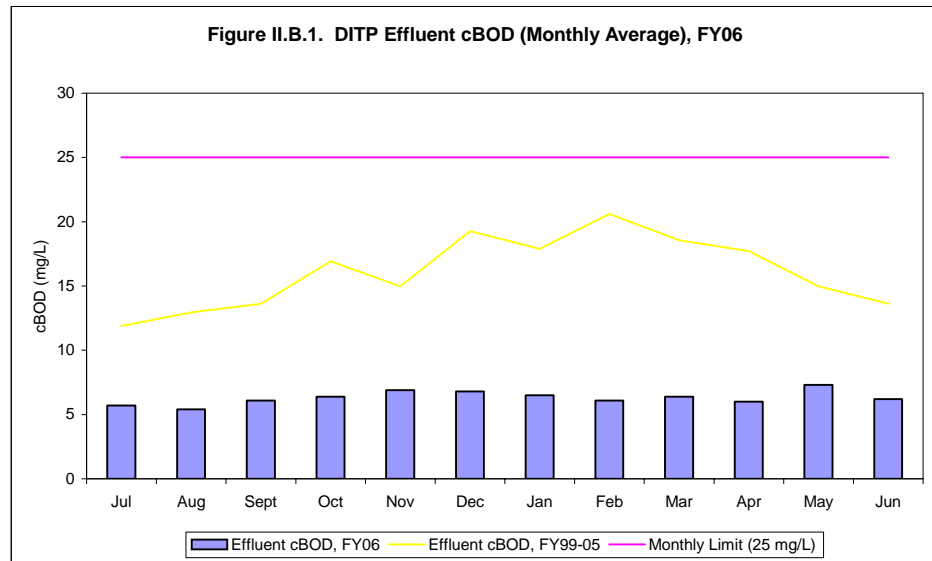
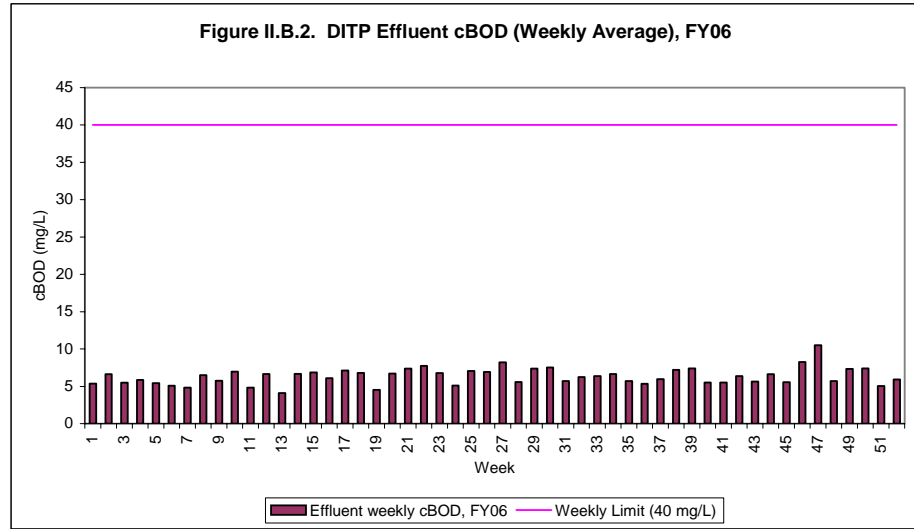


Figure II.B.2 shows there were no violations of the cBOD weekly limit (40 mg/L).



Figures II.B.3 shows FY06 monthly averages for TSS never exceeded the regulatory discharge limit of 30 mg/L. For the majority of the year, effluent TSS was also below the 5-year historical average.

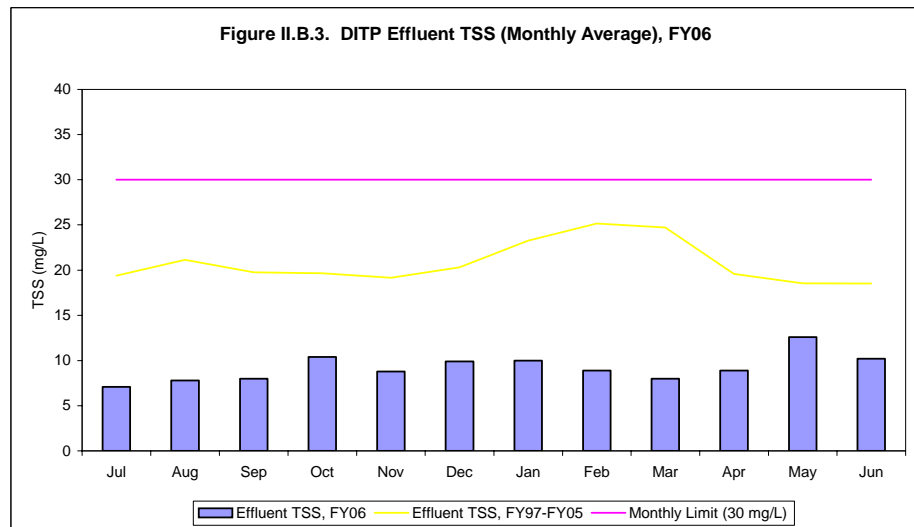
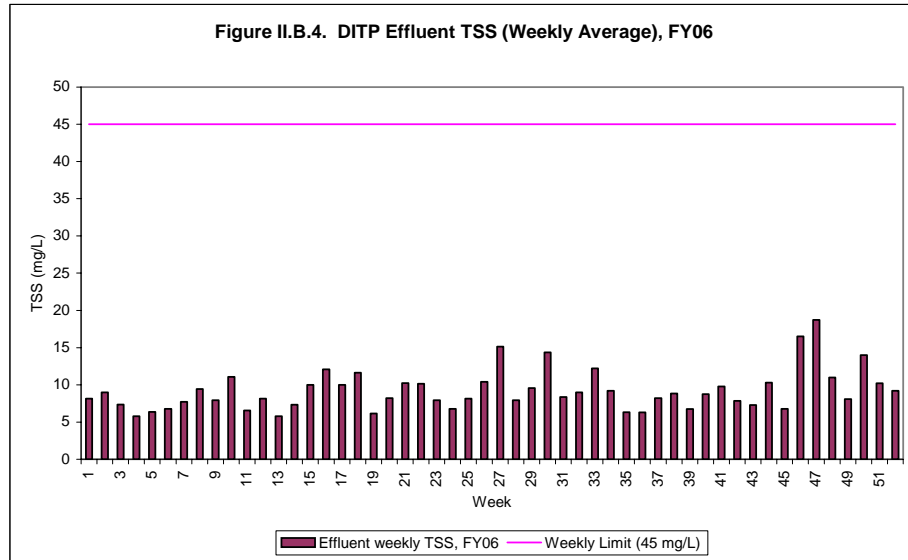
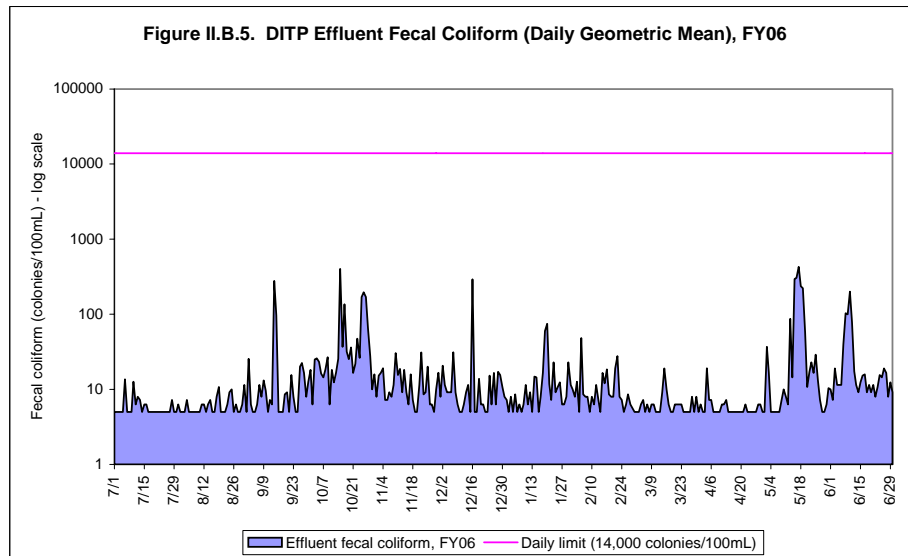


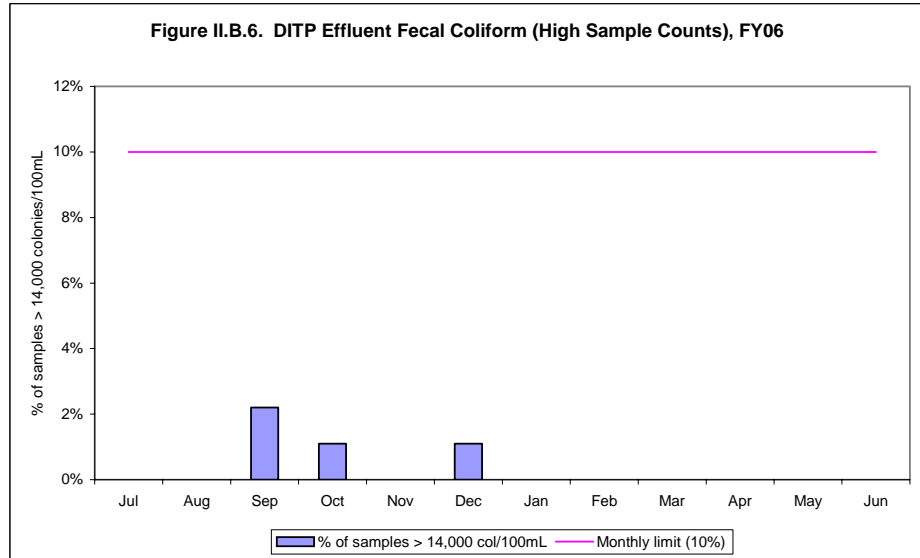
Figure II.B.4 graphs the weekly averages for effluent TSS in FY06. The regulatory limit for weekly TSS averages is 45 mg/L. In FY06 this limit was not approached.



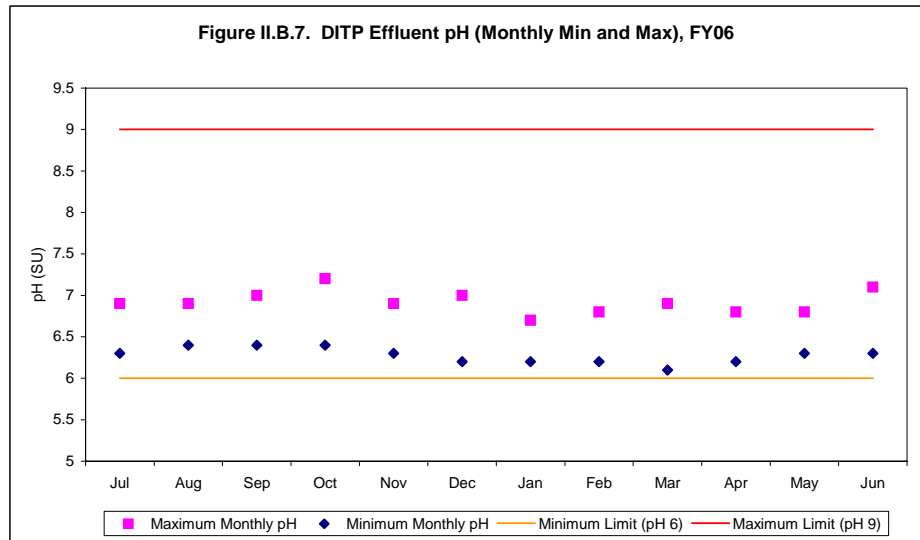
Fecal coliform has a daily discharge limit of 14,000 colonies/100mL, as calculated by the daily geometric mean of three samples per day. Figure II.B.5 shows the daily effluent trends of fecal coliform in FY06. Note that 5 colonies/100mL is the detection limit for the fecal coliform test so there will not be results below that number.



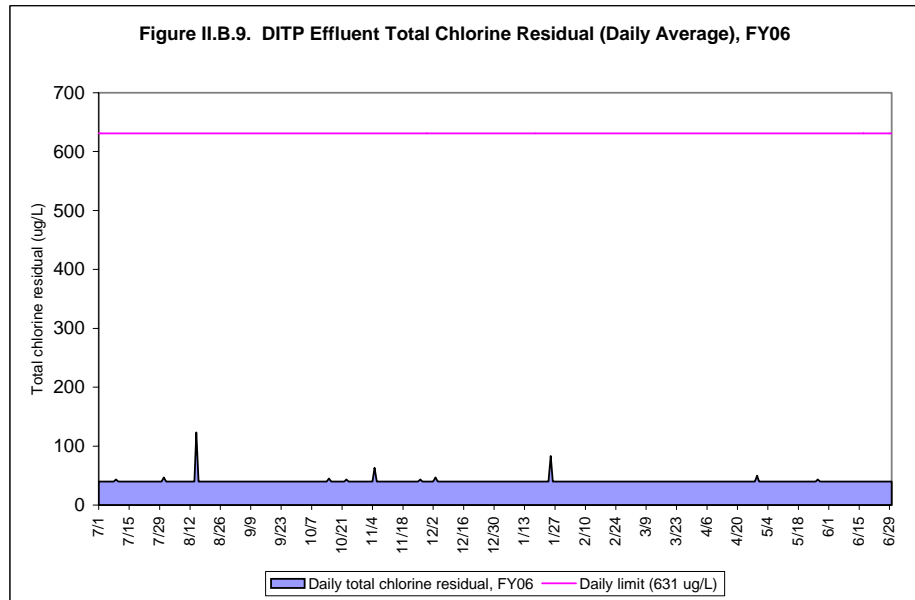
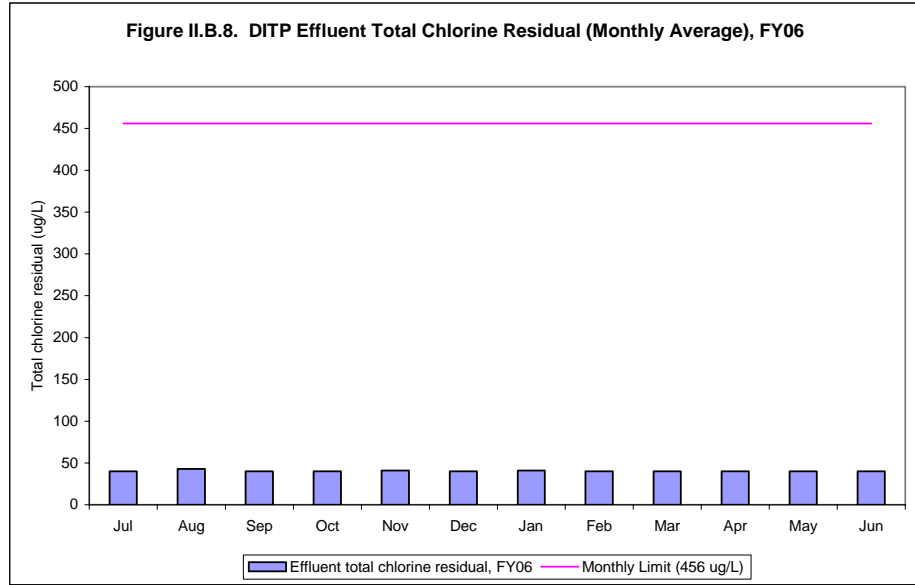
Additional limits for fecal coliform include: not more than three consecutive samples measuring over 14,000 colonies/100mL, and no more than 10% of the samples in a month measuring over 14,000 colonies/100 mL. These latter two limits were not approached. Figure II.B.6 shows the percentage of high sample counts (>14,000 colonies/100mL) by month – there were no violations of this limit either.



The limits for pH are based on the maximum and minimum values for each month, with pH required to fall between 6.0 and 9.0. In FY06, the pH of the effluent was always below the maximum of 9.0 and above the minimum of 6.0. Figure II.B.7 shows the monthly minimums and maximums throughout FY06.



The permit regulates total chlorine residual through two limits: a monthly average of 456 $\mu\text{g/L}$ and a daily maximum of 631 $\mu\text{g/L}$. Figure II.B.8 shows monthly average chlorine residual results versus the regulatory limit. The following figure, II.B.9, shows the daily results against the permit limit. Neither limit was violated, or even approached, in FY06.



In addition to the limits mentioned above, the permit sets forth two more effluent limits. Arochlors 1016, 1221, 1232, 1242, 1248, 1254, and 1260 have a 0.000045 $\mu\text{g/L}$ limit. However, none of these compounds were detected in FY06. The limit on dry day flow was covered in the Executive Summary (Fig. 2).

MWRA must also report a number of other effluent components, such as metals and nutrients, although they have no discharge limit. These are listed in Appendix G, Table G-1.

II.B.2 Effluent Quality Compared to Water Quality Standards

Table II.B.3 compares concentrations of priority pollutants in DITP effluent to water quality criteria, both acute and chronic. Even before the dilution provided by the outfall, all the pollutants except for copper were below both the acute and chronic criteria. After dilution, all the pollutants were below the acute and chronic criteria.

Table II.B.3. Comparison of DITP Effluent with Water Quality Criteria, FY06						
Acute	FY06 Effluent		Concentration at ZID (ug/L)‡	Acute Dissolved Criteria (ug/L)*	Acute Recoverable Criteria (ug/L)**	Times Detected
	Maximum (ug/L)	Dilution†				
Arsenic	0.40	50	0.008	69.0	69.0	0 of 27
Copper	70.80	50	1.416	4.8	5.8	92 of 92
Lead	6.97	50	0.139	210.0	220.8	15 of 108
Mercury	0.01	50	0.000	1.8	2.1	53 of 94
Nickel	5.55	50	0.111	74.0	74.7	95 of 95
Silver	1.30	50	0.026	1.9	2.2	88 of 95
Zinc	84.60	50	1.692	90.0	95.1	95 of 95
Chronic	FY06 Effluent		Concentration at ZID (ug/L)‡	Chronic Dissolved Criteria (ug/L)*	Chronic Recoverable Criteria (ug/L)**	Times Detected
	Average (ug/L)	Dilution†				
Arsenic	0.40	70	0.006	36.0	36.0	0 of 27
Copper	9.55	70	0.136	3.1	3.7	92 of 92
Lead	1.26	70	0.018	8.1	8.5	15 of 108
Mercury	0.00	70	0.0000	0.9	1.1	53 of 94
Nickel	2.57	70	0.037	8.2	8.3	95 of 95
Zinc	26.70	70	0.381	81.0	85.6	95 of 95

No conversion factor or chronic criteria exist for silver.
† Permit estimate from Attachment S.
‡ ZID is Zone of Initial Dilution, the area directly around the outfall.
* National Recommended Water Quality Criteria for Priority Toxic Pollutants, Federal Register, 12/10/98.
** Calculated using the conversion factors in Appendix A of the Federal Register, 12/10/98.

II.C.1 Ambient Monitoring Plan

The new permit requires ambient monitoring of the Harbor and Massachusetts Bay. The ambient monitoring plan has three main components: the Harbor and Bay monitoring plan; the maintenance of the Bays Eutrophication Model; and the implementation of plume tracking. Table II.C.1 summarizes the first and third components of the monitoring plan. Note that the plume tracking component of the plan is now completed and results are available from ENQUAD.

The Bays Eutrophication Model is a three-dimensional hydrographic model that is run annually to provide information on whether new limits are needed on the effluent discharge. The Model is designed primarily to examine nutrient inputs.

In March 2004, the MWRA issued Revision 1 of the ambient monitoring plan, which made minor changes to the original plan. Copies of the revised plan are available online at the web address on the following page.

Table II.C.1. Post-Discharge Ambient Monitoring Plan Summary			
Task	Objective	Sampling Protocol	Analyses
Effluent sampling	Characterize wastewater discharge from Deer Island Treatment Plant	3x/daily Daily Weekly Several times monthly	Nutrients Solids and organic material Toxic contaminants Bacterial indicators Chlorine
Water Column			
Nearfield surveys	Collect water quality data near outfall location	12 surveys/year 7 stations	Temperature Salinity
Farfield surveys	Collect water quality data throughout Massachusetts and Cape Cod bays (Not all analyses are performed at every near- or farfield station)	6 surveys/year 25 stations	Dissolved oxygen Nutrients Solids Chlorophyll Water clarity Photosynthesis Respiration Plankton Marine mammal observations
Plume-track surveys	Track discharge plume, measure discharge dilution	Completed	Completed
Mooring (USGS and GoMOOS)	Provides continuous oceanographic data near outfall location and Cape Ann	Continuous monitoring USGS near outfall GoMOOS near Cape Ann	Temperature Salinity Water clarity Chlorophyll
Remote sensing	Provides oceanographic data on a regional scale through satellite imagery	Available daily (cloud-cover permitting)	Surface temperature Chlorophyll
Sea Floor			
Soft-bottom studies	Evaluate sediment quality and benthos in Boston Harbor and Massachusetts Bay	1 survey/year 23 nearfield stations 8 farfield stations	Sediment chemistry Sediment profile imagery Community composition
Hard-bottom studies	Characterize marine benthic communities in rock and cobble areas	1 survey/year 23 stations	Topography Substrate Community composition
Fish and Shellfish			
Winter flounder	Determine contaminant body burden and population health	1 survey/year 4 stations	Tissue contaminant concentrations Physical abnormalities Liver histopathology
American lobster	Determine contaminant body burden	1 survey/year 3 stations	Tissue contaminant concentrations Physical abnormalities
Blue mussel	Evaluate biological condition and potential contaminant bioaccumulation	1 survey/year 3 stations	Tissue contaminant concentrations

Adapted from Werme, C. 2003. 2002 *Outfall Monitoring Overview*. ENQUAD report 2003-12.

Updated from MWRA. 2004. *MWRA Effluent Outfall Ambient Monitoring Plan, rev. 1, 3/04*. ENQUAD report ms-092.

The Outfall Monitoring Science Advisory panel (OMSAP), a panel of scientific experts convened by the EPA and MA DEP, oversees the monitoring plan and examines scientific data produced by the MWRA and MWRA consultants. OMSAP also serves as a peer review board for technical reports, and advises EPA and MA DEP on the implications of monitoring observations. Finally, OMSAP evaluates any exceedances under the Contingency Plan, described in the next section.

Much more information on the ambient monitoring plan is available on the Internet. Documents directly associated with the permit, including Revision 1 of the ambient monitoring plan, can be found at:

<http://www.mwra.state.ma.us/harbor/html/ambient.htm>

Associated information and synthesis reports generated by ambient monitoring results can be found at:

Boston Harbor: <http://www.mwra.state.ma.us/harbor/html/wklyintr.htm>

Massachusetts Bay: <http://www.mwra.state.ma.us/harbor/html/mbmon.htm>

The OMSAP web page, including announcements for public meetings, is at:
<http://www.epa.gov/region1/omsap/index.html>

**II.C.2
The
Contingency
Plan**

The permit requires a contingency plan that defines a response plan when a parameter threshold is exceeded. Responses may include changes in laboratory procedures, changes in treatment plant process, or, in a worse case scenario, examining the feasibility of re-opening the Deer Island harbor outfalls. Tables II.C.2.a-c show the thresholds for the parameters. The effluent and toxicity thresholds are set to be equal to the NPDES permit limits. However, the Contingency Plan includes a number of new thresholds related to parameters monitored under the Ambient Monitoring Plan in Massachusetts Bay.

Table II.C.2.a. Contingency Plan Thresholds: Toxic Contaminants		
Parameter	Caution Level	Warning Level
Effluent chlorine	-	456 ug/L average monthly 631 ug/L maximum daily
Effluent PCBs	0.000045 ug/L monthly limit (as Arochlors)	-
Effluent toxicity	-	Acute: effluent LC50 < 50% for shrimp and fish Chronic: effluent NOEC for fish growth and sea urchin fertilization < 1.5%
Water column initial dilution of effluent	-	Effluent dilution predicted by EPA as basis for NPDES permit
Nearfield sediment toxics	-	NOAA Effects Range Median sediment guideline
Nearfield sediment toxics	90% EPA sediment criteria	EPA sediment criteria
Fish tissue mercury, near outfall	0.5 ug/g wet	0.8 ug/g wet
Fish tissue PCB, near outfall	1 ug/g wet	1.6 ug/g wet
Mussel tissue lead, near outfall	2 ug/g wet	3 ug/g wet
Fish tissue lipid-normalized toxics, near outfall	2 x baseline	-
Flounder liver disease incidence	Greater than harbor prevalence over time	-

Table II.C.2.b. Contingency Plan Thresholds: Nutrients		
Parameter	Caution Level	Warning Level
Effluent total nitrogen	12,500 mtons/year	14,000 mtons/year
Dissolved oxygen concentration, nearfield water column bottom, Stellwagen bottom	6.5 mg/L for any survey during stratification (June-Oct.) unless background conditions are lower	6 mg/L for any survey during stratification (June-Oct.) unless background conditions are lower
Dissolved oxygen percent saturation, nearfield water column bottom, Stellwagen bottom	80% saturation for any survey during stratification (June-Oct.) unless background conditions are lower	75% saturation for any survey during stratification (June-Oct.) unless background conditions are lower
Oxygen depletion rate, nearfield water column bottom	1.5 x baseline	2 x baseline
Nearfield water column chlorophyll	1.5 x baseline annual mean	2 x baseline annual mean
Nearfield water column chlorophyll	95th percentile of the baseline seasonal distribution	-
Nearfield water column nuisance algae (except <i>Alexandrium</i>)	95th percentile of the baseline seasonal mean	-
Nearfield water column zooplankton (1)	-	-
Nearfield water column <i>Alexandrium tamarense</i>	100 cells/L	-
Farfield water column PSP extent (2)	New incidence	-
Redox potential discontinuity, nearfield sediments	0.5 x baseline	-
<p>(1) The MWRA will report annually on appreciable changes to the zooplankton community in its Annual Water Column Report and in the Outfall Monitoring Overview. The MWRA also makes every effort to participate in workshops to investigate food web pathways in Massachusetts and Cape Cod bays sponsored by NOAA Fisheries.</p> <p>(2) The MWRA is continuing to work on improvements to the calculation of this threshold as proposed in its October 13, 2000 letter to the EPA and MADEP.</p>		

Table II.C.2.c. Contingency Plan Thresholds: Other Parameters		
Parameter	Caution Level	Warning Level
Effluent cBOD	-	40 mg/L weekly 25 mg/L monthly
Effluent fecal coliform	-	14,000 fecal coliforms/100 ml
Effluent TSS	-	45 mg/L weekly 30 mg/L monthly
Nearfield benthic diversity	Appreciable change	-
Nearfield benthic opportunists	10%	25%
Effluent floatables (4)	-	-
Effluent oil and grease (petroleum)	-	15 mg/L weekly
Plant performance	5 violations/year	Noncompliance 5% of the time pH <6 or >9 at any time Flow >436 MGD for an annual average dry day
<p>(3) Threshold currently under development by MWRA.</p>		

Adapted from MWRA. 2001. *Contingency Plan*, Revision 1, May 2001. MWRA Report ENQUAD ms-071.

Under the Contingency Plan, two types of thresholds exist: a caution level and a warning level. Figure II.C.1 on the following page details the processes required by the Contingency Plan in case of a threshold exceedance. Table II.C.3 below details the Contingency Plan exceedances in FY06. For more information on these exceedances, please refer to the web site listed below.

Table II.C.3. Contingency Plan Exceedances, FY06		
Threshold Level		
Date*	Exceeded	Threshold Exceeded
October 28, 2005	Caution (Ambient)	Abundance of <i>Phaeocystis</i> was over the threshold for the summer season.
May 26, 2006	Caution (Ambient)	Levels of <i>Alexandrium</i> were over the threshold in the outfall nearfield.

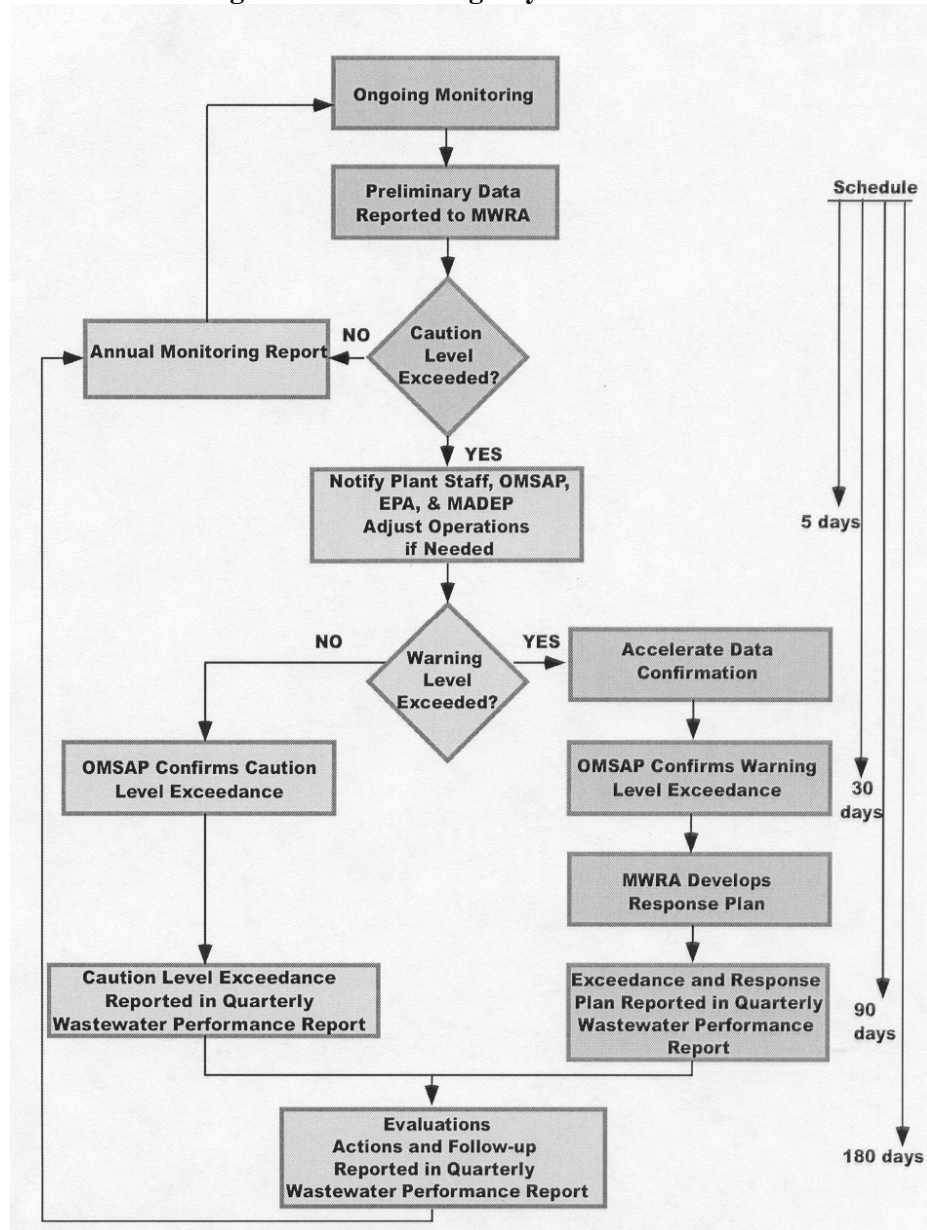
* Notification date; typically within 5 days of knowing of the violation.

In addition to the thresholds, the Contingency Plan also requires several other unrelated items. First, the MWRA must update annually a technical survey regarding tertiary treatment systems designed to remove nutrients. Second, the Authority must maintain a nitrogen monitoring program at DITP to examine the need for tertiary treatment. Both of these efforts are ongoing. Third, there must be a “dry run” of a Contingency Plan violation to assess the validity of the Contingency Plan structure. Fourth, \$81 million must be held in reserve for emergency use. Finally, the old Boston Harbor outfalls must be maintained in case diversion of the effluent back to the Harbor is deemed necessary. These last three options have been successfully completed.

More information on Contingency Plan topics is on the Internet at:
<http://www.mwra.state.ma.us/harbor/html/contingency.htm>

Exceedance reports are posted at:
<http://www.mwra.state.ma.us/harbor/html/exceed.htm>

Figure II.C.1 Contingency Plan Flowchart



III: Combined Sewer Overflows

Overview

MWRA monitors five CSO facilities in the North System. There are no CSO facilities in the South System. The monitoring results vary significantly between facilities because of differences in type and location. Location is especially important since storms can be highly localized, affecting the level and intensity of rainfall at the CSO facility and the area that the facility serves. Improvements to the transport system (such as sewer separation projects) and the CSO facilities themselves have improved the capture of combined sewage. This has resulted in having fewer activations but a greater discharge volume.

Each CSO facility screens, chlorinates, and dechlorinates combined wastewater (sewage and storm water) prior to discharge. The Cottage Farm and Prison Point facilities also have pumping and tank storage capacity. Pumping and tank storage allows screened and chlorinated wastewater to be held at these facilities up to their storage capacities prior to discharge. Stored wastewater can eventually be pumped back into the system and processed at Deer Island. Any wastewater exceeding the storage capacity will overflow and discharged through the CSO outfalls.

The other three CSO facilities – Somerville Marginal, Fox Point, and Commercial Point – are gravity CSO facilities, meaning that combined wastewater arrives and leaves the CSO facility by gravity instead of pumping. The disinfected wastewater overflows to the receiving water as quickly as it arrives at the facility. A detailed description of the five CSO facilities can be found in Appendix H.

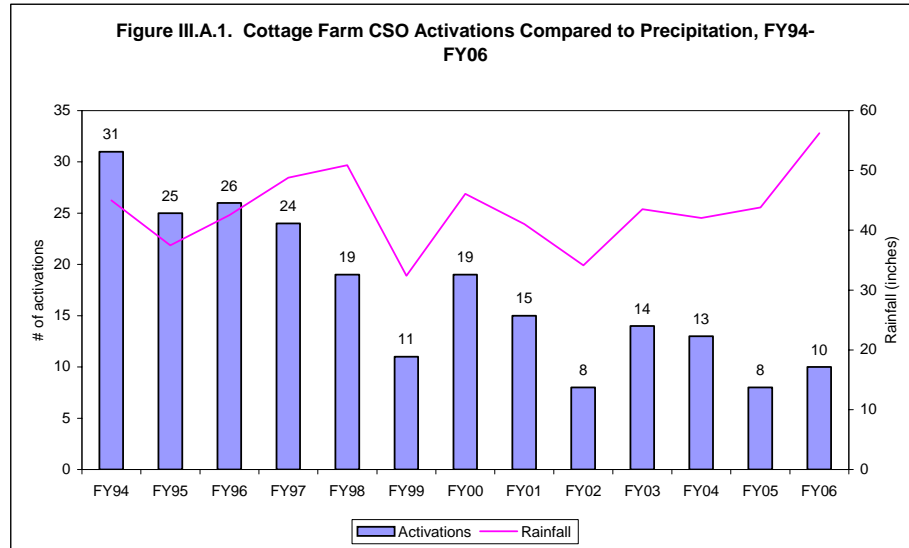
**III.A.1
Cottage Farm
Activations**

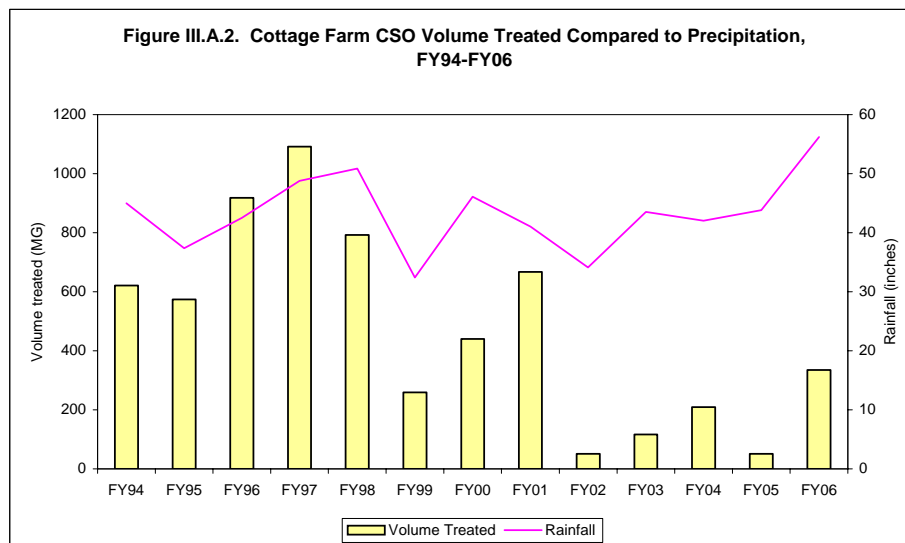
Table III.A.1 and Figures III.A.1 and III.A.2 summarize activation data for the Cottage Farm CSO facility. Cottage Farm is hydraulically connected to Deer Island, so the increased pumping capacity at Deer Island is partially responsible for the general trend of decreasing activations since FY94.

Releases increased from FY05 to FY06 from 50.71 to 334.6 million gallons. Number of activations did not increase proportionally. Rainfall in FY06 was a very high 56.23 inches, and most of that rainfall was concentrated in the fall of 2004 and the late spring of 2005. This resulted in a number of large rain storms which explains the combination of a relatively low number of activations with a huge increase in volume of effluent discharged.

Table III.A.1. Cottage Farm CSO Activations Summary													
	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Number of activations	31	25	26	24	19	11	19	15	8	14	13	8	10
Number of days activated	31	25	33	29	22	13	24	18	10	16	15	9	13
Total volume treated (MG)	621	574	918.49	1092.1	792.31	259	440.27	667.42	50.9	116.71	209.19	50.71	334.63
Maximum flow (MGD)	123	100	94.02	199.23	113.62	47	86.04	223.37	13.4	20.62	62.47	11.8	84.9
Minimum flow (MGD)	0.08	0.09	1.88	0.63	0.76	1.35	0.56	0.22	0.63	0.91	0.61	1.36	0.71
Average flow (MGD)	20.032	22.96	27.833	37.659	36.014	19.923	18.345	37.08	5.09	7.29	13.95	5.63	27.89
Total rainfall (inches)	45	37.4	42.55	48.79	50.87	32.41	46.08	41.02	34.14	43.51	42.02	43.81	56.23

Average flow = Total volume treated divided by the number of days activated.





**III.A.2
Cottage Farm
Conventional
Parameters**

Table B-1 of Appendix B contains detailed data on conventional parameters in Cottage Farm effluent. Table III.A.2 below summarizes this data. As is the case with all five facilities covered in this chapter, Cottage Farm is a CSO facility that provides floatables control, chlorination, and dechlorination. Such a facility cannot provide the same level of effluent treatment as a full-fledged treatment plant such as Deer Island. CSO effluent pH is often rather low in comparison to effluent from Deer Island or other treatment plants as CSO facilities cannot correct for sewage that enters the facility with an already low pH.

Parameter	Minimum	Average	Maximum
TSS (mg/L)	43.1	61.3	98.8
BOD (mg/L)	43.1	52.7	54.4
Fecal Coliform (col/100 mL)	60	296	1856
pH (SU)	6.0		6.9

**III.A.3
Cottage Farm
Effluent
Metals**

MWRA also tests CSO effluent for metals and surfactants whenever the CSO facility is sampled. The results of these tests are presented in Appendix B, Tables B-2 and B-3. The target metals were detected in nearly every sample. Table III.A.3 summarizes average metal concentrations in Cottage Farm effluent in FY06.

Parameter	Average Concentration	Times Detected
Cadmium (ug/L)	0.33	2 of 5
Calcium (ug/L)	17850.00	3 of 3
Chromium (ug/L)	4.28	2 of 4
Copper (ug/L)	35.00	3 of 3
Lead (ug/L)	19.25	2 of 3
Magnesium (ug/L)	3590.00	3 of 3
Mercury (ug/L)	0.19	2 of 2
Nickel (ug/L)	3.23	2 of 5
Zinc (ug/L)	86.88	3 of 3

III.B.1 Prison Point Activations

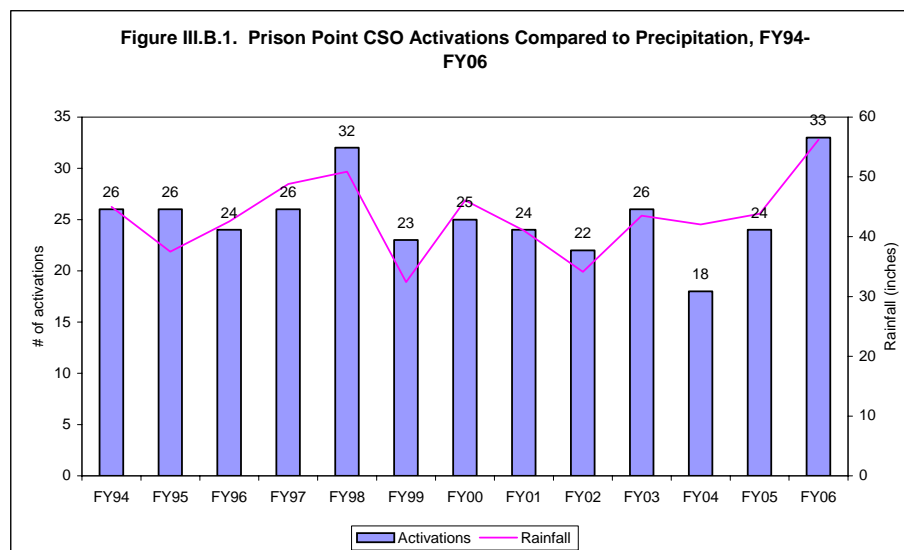
Activation data for the Prison Point CSO facility are summarized in Table III.B.1 and Figures III.B.1 and III.B.2.

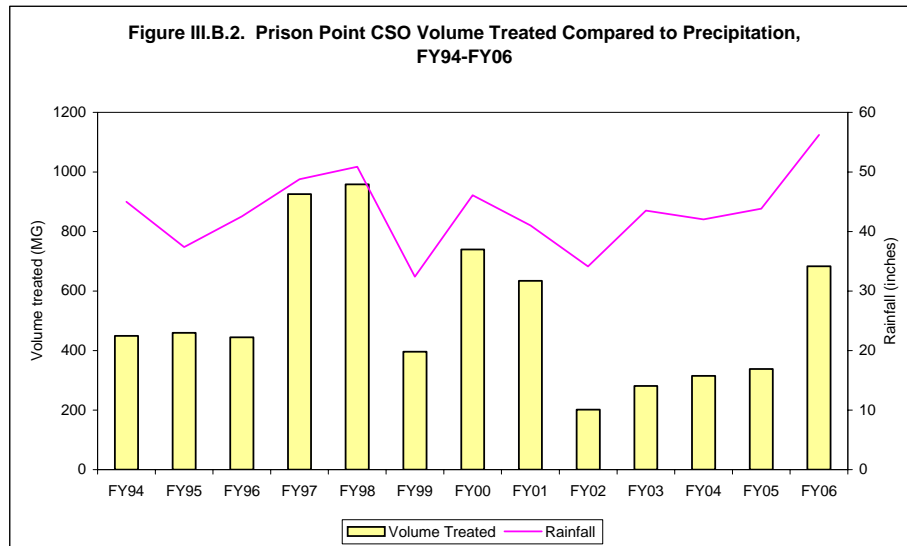
Unlike the Cottage Farm facility, Prison Point is not hydraulically connected to the Deer Island Treatment Plant, so increased pumping at Deer Island will not affect Prison Point activations; hence they have remained relatively constant since FY94, primarily dependent on rainfall.

The number of activations rose in FY06; not an unanticipated result due to the very high recorded rainfall (the highest in the FY94-FY06 period by a substantial margin). Volume discharged more than doubled, and average flow per activation also increased. Those results are also to be expected due both to the heavy rainfall and the number of large, sustained storms during FY06.

	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Number of activations	26	26	24	26	32	23	25	24	22	26	18	24	33
Number of days activated	26	26	29	30	34	23	30	26	27	27	21	31	36
Total volume treated (MG)	449	460	445	925.82	958	396	739.5	634.05	201.23	280.71	314.79	337.81	683.3
Maximum flow (MGD)	80.32	127	62.6	228	143	51	149	188	24.5	31.34	97.55	38.2	126.1
Minimum flow (MGD)	3.01	1.63	1.24	1.5	2	1.4	2.5	1	0.41	0.47	0.79	1	1.08
Average flow (MGD)	17.27	17.69	15.34	30.86	28.18	17.22	24.65	24.39	7.45	10.4	14.99	10.9	18.98
Total rainfall (inches)	45	37.4	42.55	48.79	50.87	32.41	46.08	41.02	34.14	43.51	42.02	43.81	56.23

Average flow = Total volume treated divided by the number of days activated.





**III.B.2
Prison Point
Conventional
Parameters**

Conventional parameter data for Prison Point effluent are provided in Appendix C, Tables C-1 and C-2. Table III.B.2 summarizes that data.

Parameter	Minimum	Average	Maximum
TSS (mg/L)	48.3	122.8	350.0
BOD (mg/L)	10.6	33.8	54.3
Fecal Coliform (col/100 mL)	10	54	200
pH (SU)	6.2		6.8

**III.B.3
Prison Point
Effluent
Metals**

The results of priority pollutant testing for Prison Point can be found in Tables C-2 and C-3 of Appendix C. As with Cottage Farm, the target metals were detected in nearly all of the samples. Table III.B.3 summarizes average metals concentrations in FY06 Prison Point effluent.

Parameter	Average Concentration	Times Detected
Cadmium (ug/L)	0.63	3 of 6
Chromium (ug/L)	16.59	3 of 3
Copper (ug/L)	8097.00	3 of 3
Lead (ug/L)	97.27	3 of 3
Mercury (ug/L)	0.15	3 of 4
Nickel (ug/L)	5.93	3 of 3
Zinc (ug/L)	269.67	3 of 3

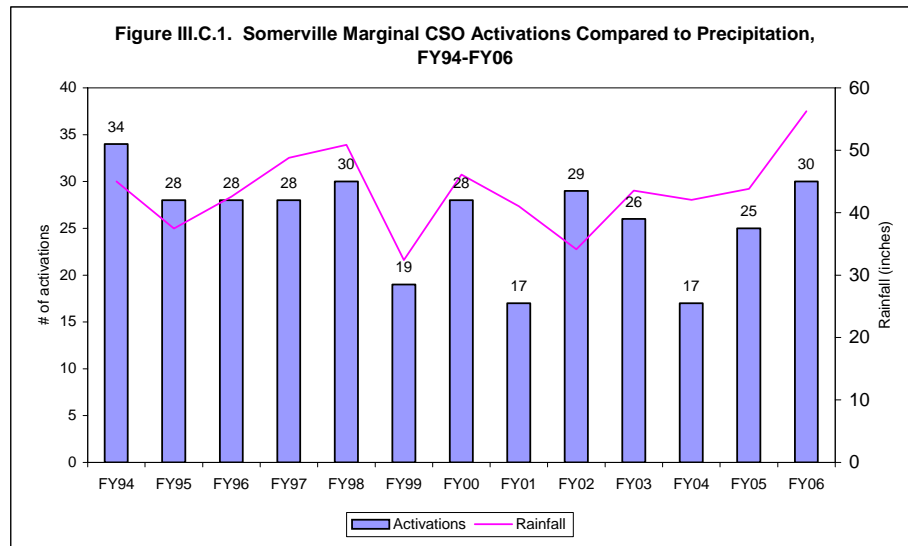
**III.C.1
Somerville
Marginal
Activations**

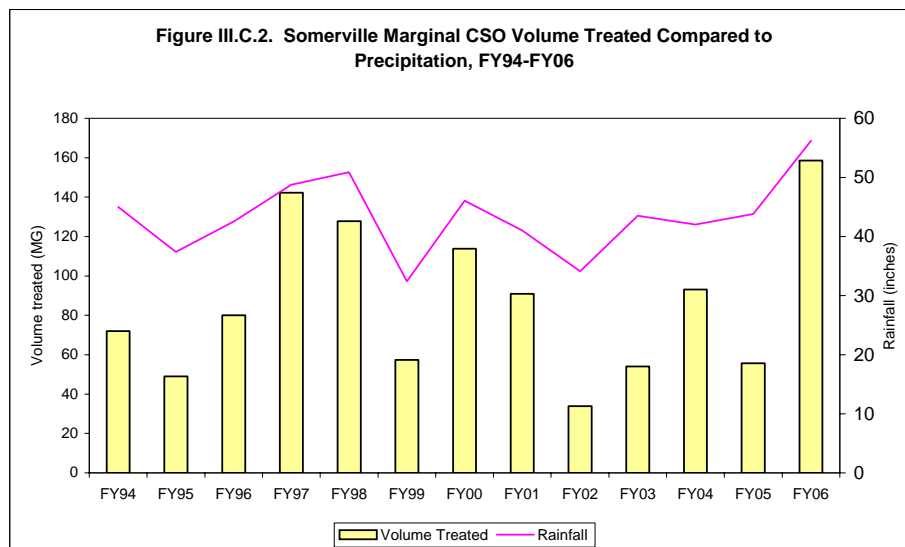
Table III.C.1 and Figures III.C.1 and III.C.2 summarize activation information for the Somerville Marginal facility. Recently, there has been increased attention to SSOs (Sanitary Sewer Overflows); see Chapter V for more information. MWRA has intensified its monitoring efforts at areas known to overflow where there is a measurable rainfall event. In coordination with this increased SSO monitoring, MWRA has monitored its unmanned gravity CSO facilities of Somerville Marginal, Fox Point, and Commercial Point more frequently. As a result, the statistics for FY98 and after may not be strictly comparable to the earlier years.

Somerville Marginal in FY06 shows a similar pattern to Cottage Farm and Prison Point – a rise in activations, total volume treated, and average volume discharged due to the 56.23 inches of rain that fell in FY06.

Table III.C.1. Somerville Marginal CSO Activations Summary													
	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Number of activations	34	28	28	28	30	19	28	17	29	26	17	25	30
Number of days activated	34	28	30	29	31	19	34	21	30	28	17	30	34
Total volume treated (MG)	72	49	80.04	142.24	127.81	57.32	113.8	90.9	33.87	54.05	93.13	55.66	158.6
Maximum flow (MGD)	11	14	8.5	64.18	21.72	10.29	25.06	33	5.1	6.76	26.68	5.85	29.39
Minimum flow (MGD)	0.006	0.158	0.25	0.13	0.09	0.04	0.01	0.09	0.02	0.05	0.51	0.18	0.12
Average flow (MGD)	2.12	1.75	2.67	4.90	4.12	3.02	3.35	4.33	1.17	1.93	5.48	1.86	4.66
Total rainfall (inches)	45	37.4	42.55	48.79	50.87	32.41	46.08	41.02	34.14	43.51	42.02	43.81	56.23

Average flow = Total volume treated divided by the number of days activated.





**III.C.2
Somerville
Marginal
Conventional
Parameters**

Somerville Marginal conventional parameter data is provided in Appendix D, and summarized below in Table III.C.2.

Parameter	Minimum	Average	Maximum
TSS (mg/L)	24.3	80.3	158.0
BOD (mg/L)	24.8	31.1	40.6
Fecal Coliform (col/100 mL)	10	13	25
pH (SU)	6.9		8.3

**III.C.3
Somerville
Marginal
Effluent
Metals**

The results of Somerville Marginal priority pollutant testing can be found in Appendix D, Tables D-2 and D-3. As with the other CSO facilities, the target metals were detected in most of the samples. Table III.C.3 summarizes the average metals concentration in FY06.

Parameter	Average Concentration	Times Detected
Cadmium (ug/L)	0.29	4 of 9
Calcium (ug/L)	7542.50	5 of 5
Chromium (ug/L)	11.22	5 of 5
Copper (ug/L)	26.85	5 of 5
Lead (ug/L)	37.13	4 of 5
Magnesium (ug/L)	5198.33	5 of 5
Mercury (ug/L)	0.12	4 of 4
Nickel (ug/L)	3.83	3 of 7
Zinc (ug/L)	110.84	5 of 5

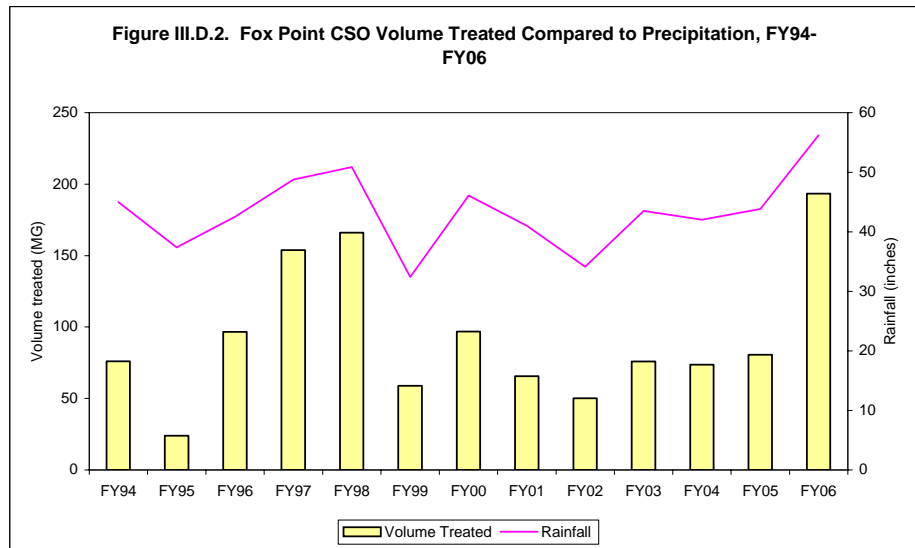
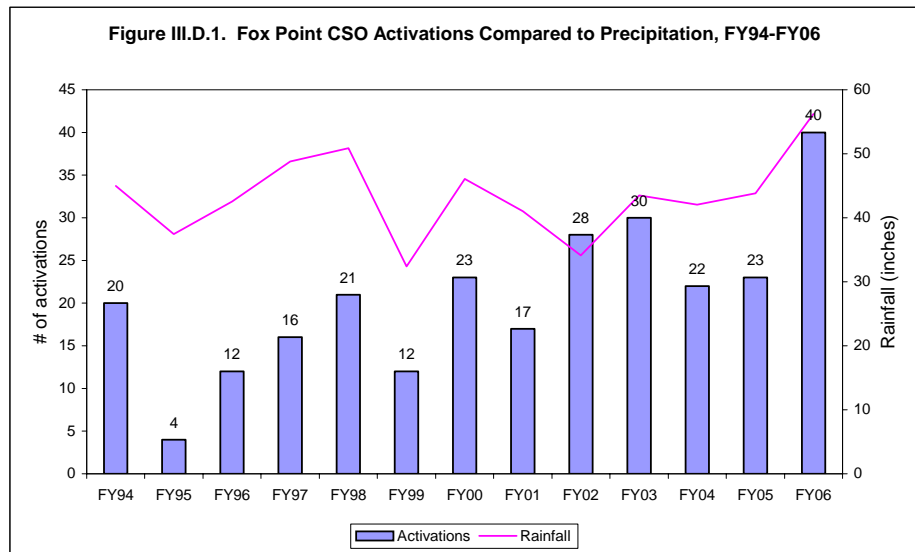
**III.D.1
Fox Point
Activations**

Table III.D.1 and Figures III.D.1 and III.D.2 summarize activation data for the Fox Point CSO facility.

Like the rest of the CSO facilities examined so far, Fox Point activated and discharged more than in FY05 due the heavier rainfall in FY06.

	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Number of activations	20	4	12	16	21	12	23	17	28	30	22	23	40
Number of days activated	20	4	14	18	24	12	25	20	28	33	23	27	43
Total volume treated (MG)	76	24	96.63	153.81	166	59.3	96.93	65.69	50.26	75.92	73.76	80.66	193.4
Maximum flow (MGD)	12	10	17.23	45.16	39	14.8	24.66	16.16	5.67	7.16	20.4	11.72	28.48
Minimum flow (MGD)	0.4	1.5	1.09	0.26	0.171	0.31	0.47	0.03	0.2	0.06	0.35	0.43	0.16
Average flow (MGD)	3.8	6	6.90	8.55	6.92	4.94	3.88	3.28	1.79	2.3	3.51	3.1	4.5
Total rainfall (inches)	45	37.4	42.55	48.79	50.87	32.41	46.08	41.02	34.14	43.51	42.02	43.81	56.23

Average flow = Total volume treated divided by the number of days activated.



**III.D.2
Fox Point
Conventional
Parameters**

Appendix E, Table E-1, provides data on conventional pollutants collected at Fox Point in FY06. Results are summarized below in Table III.D.2.

Parameter	Minimum	Average	Maximum
TSS (mg/L)	21.5	133.5	427.7
BOD (mg/L)	8.5	10.6	14.4
Fecal Coliform (col/100 mL)	10	16	33
pH (SU)	6.7		8.2

**III.D.3
Fox Point
Effluent
Metals**

The results of sampling for priority pollutants at Fox Point can be found in Appendix E, Tables E-2 and E-3. Table III.D.3 summarizes the average metals concentrations in FY06.

Parameter	Average Concentration	Times Detected
Cadmium (ug/L)	0.26	2 of 5
Chromium (ug/L)	7.05	3 of 3
Copper (ug/L)	17.78	3 of 3
Lead (ug/L)	44.00	2 of 4
Mercury (ug/L)	0.15	2 of 2
Nickel (ug/L)	5.54	3 of 3
Zinc (ug/L)	86.53	3 of 3

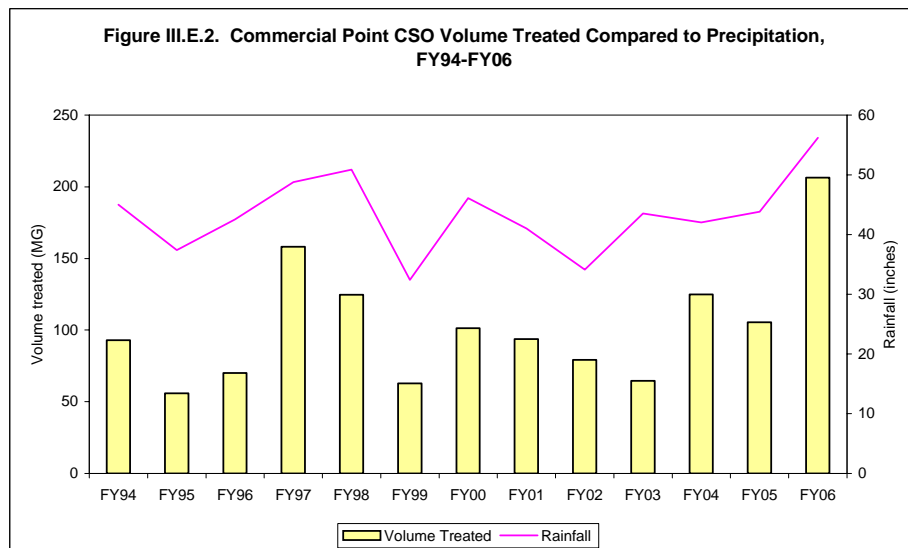
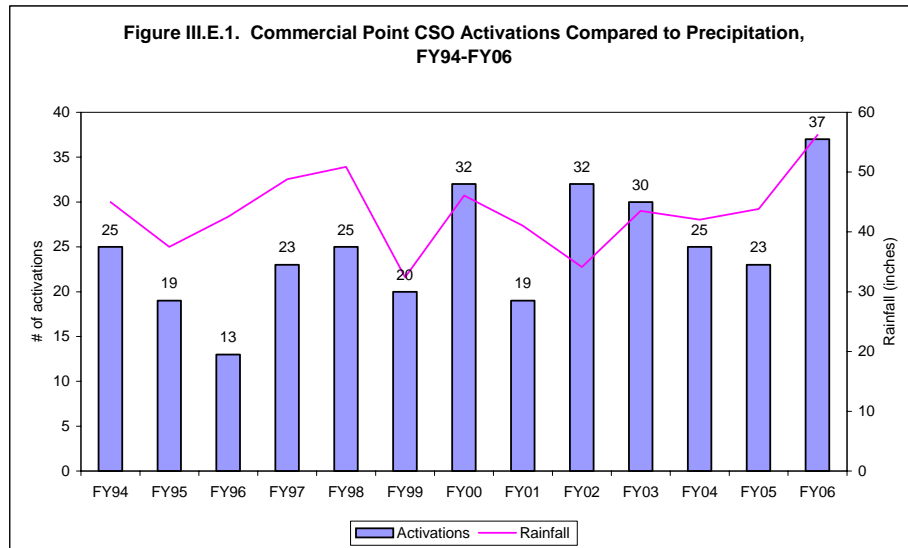
**III.E.1
Commercial
Point
Activations**

Data on Commercial Point activations can be found in Appendix F, and in the table and two figures below.

Unsurprisingly, discharges at Commercial Point reflected the high rainfall of FY06. Since FY94, no fiscal year has seen more rain than FY06. FY06 at Commercial Point also had the highest number of activations and amount of discharge volume in the FY94-FY06 period.

Table III.E.1. Commercial Point CSO Activations Summary													
	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Number of activations	25	19	13	23	25	20	32	19	32	30	25	23	37
Number of days activated	25	19	14	24	28	20	36	24	35	32	26	28	41
Total volume treated (MG)	93	55.95	70.14	158.14	124.74	62.78	101.33	93.77	79.23	64.5	124.92	105.45	206.4
Maximum flow (MGD)	16.52	16.7	18.42	53.86	25	12.39	30.42	30.84	7.8	7.3	35.85	16.28	34.69
Minimum flow (MGD)	0.21	0.15	0.06	0.19	0.14	0.1	0.03	0.06	0.2	0.05	0.03	0.42	0.37
Average flow (MGD)	3.72	2.94	5.01	6.59	4.46	3.14	2.81	3.91	2.26	2.02	4.8	3.77	5.03
Total rainfall (inches)	45	37.47	42.55	48.79	50.87	32.41	46.08	41.02	34.14	43.51	42.02	43.81	56.23

Average flow = Total volume treated divided by the number of days activated.



**III.E.2
Commercial
Point
Conventional
Parameters**

Appendix F, Table F-1 presents data for conventional parameters sampled at Commercial Point in FY06. Results are summarized in Table III.E.2 below.

Parameter	Minimum	Average	Maximum
TSS (mg/L)	18.6	82.5	206
BOD (mg/L)	7.4	9.6	13.6
Fecal Coliform (col/100 mL)	14	39	210
pH (SU)	6.8		7.8

**III.E.3
Commercial
Point Effluent
Metals**

Table III.E.3 summarizes data from Appendix F, Tables F-2 and F-3 regarding priority pollutants at Commercial Point. Metals were found in detectable amounts in nearly all the samples.

Parameter	Average Concentration	Times Detected
Cadmium (ug/L)	0.36	2 of 4
Chromium (ug/L)	12.52	2 of 2
Copper (ug/L)	232.00	2 of 2
Lead (ug/L)	59.70	2 of 2
Mercury (ug/L)	0.10	2 of 2
Nickel (ug/L)	5.98	2 of 2
Zinc (ug/L)	89.95	2 of 2

IV: Sludge Processing

Overview In December 1991, the MWRA ceased discharge of sludge into Boston Harbor. The digested sludge is now sent to a plant located on the Fore River in Quincy for processing into fertilizer pellets.

IV.A Pelletizing Process

The pelletizing process begins at the Deer Island Treatment Plant, where gravity thickeners handle sludge and scum from the plant's primary batteries. Centrifuges thicken secondary sludge and scum, with the help of added polymers. Centrate, or the liquid produced by these processes, is sent back to the head of the plant for treatment.

The thickened product is then transferred to Deer Island's most distinctive feature, the egg-shaped anaerobic digesters. In the digesters, bacteria break down the sludge into methane, carbon dioxide, organic material, and water. The methane is tapped, stored, and used later to generate electrical power or heat for Deer Island. The digested sludge is pumped via a small pipe in the Inter-Island Tunnel across the Harbor to the Fore River Pelletizing facility. This tunnel connection became fully operational in April 2005.

At the pelletizing plant, centrifuges dewater the sludge into "cake," and dryers further process the sludge into the fertilizer pellets. The centrate from the centrifuges is transferred back to Deer Island for treatment via a second small pipe in the Inter-Island Tunnel by way of the Braintree-Weymouth Intermediate Pump Station. The tunnel replaced the earlier barge service on December 16, 2004. The pellets, marketed as "Bay State Fertilizer," are stored at the facility after production. They can either be packaged on-site, or loaded and shipped out in bulk by rail.

Bay State Fertilizer is available in limited quantities to the general public, and is more widely available to local municipalities and for wholesale purchase.

IV.B Sludge Pellet Regulations

Both the federal government and the Commonwealth of Massachusetts have regulations for the composition of fertilizer pellets. The federal government regulates copper, molybdenum, nickel, zinc, arsenic, cadmium, lead, mercury, and selenium. Massachusetts sets limits for all of the above except arsenic and selenium, while adding limits for boron and chromium. In most cases the Massachusetts standard are tougher than the federal standards. Meeting these regulations has generally not been a problem for the MWRA. Table IV.B.1 (next page) summarizes the applicable standards.

Table IV.B.1 Federal and State Limits for Sludge Pellet Metals		
Parameter	Federal Limit (ppm)	Massachusetts Type 1* Limit (ppm)
Arsenic	41	NR
Boron	NR	300
Cadmium	39	14
Chromium	NR	1000
Copper	1500	1000
Lead	300	300
Mercury	17	10
Molybdenum	75	25
Nickel	420	200
Selenium	100	NR
Zinc	2800	2500
NR: Not regulated		
*: Type 1 pellets are certified for marketing and distribution in Massachusetts by MADEP		

Due to the February 19 annual submittal date for sludge data, sludge data is compiled by calendar year. However, in calendar year 2005 and 2006 (CY05 and CY06, respectively), there were no violations of federal standards for sludge pellets. In three months there were violations of the Massachusetts standard for molybdenum for both CY05 and CY06. Table IV.B.2 summarizes the analytical results. The plant processed 36,042 tons of sludge in CY05, and 40,575 tons in CY06.

Table IV.B.2a Summary of Sludge Pellet Analysis, Calendar Year 2005												
Parameter	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05
Arsenic (mg/kg, dry weight)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron (mg/kg, dry weight)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium (mg/kg, dry weight)	2.7	2.3	2.1	2.8	2.2	2.6	2.2	2.4	2.1	2.5	2.2	2.3
Chromium (mg/kg, dry weight)	55.5	58.2	54.9	52.9	41.2	48.7	44.2	46.0	41.9	45.6	49.6	46.3
Copper (mg/kg, dry weight)	679.0	6968.0	634.2	600.8	605.3	640.8	623.5	680.6	676.8	695.8	643.0	623.3
Lead (mg/kg, dry weight)	188.0	192.5	168.4	163.0	165.0	172.3	156.8	192.0	167.5	178.0	176.0	164.8
Mercury (mg/kg, dry weight)	3.0	3.3	3.0	3.0	2.6	2.6	2.5	2.4	2.2	2.2	2.1	2.8
Molybdenum (mg/kg, dry weight)	18.4	14.7	13.8	11.7	12.1	14.9	22.2	26.5	34.8	39.2	22.8	14.3
Nickel (mg/kg, dry weight)	26.6	28.9	27.5	27.4	24.4	23.9	23.3	23.6	21.4	25.0	23.3	23.0
Selenium (mg/kg, dry weight)	5.6	5.9	5.9	6.1	5.1	5.8	5.7	5.5	5.2	5.2	5.3	5.5
Zinc (mg/kg, dry weight)	1180.0	1270.0	1192.0	1130.0	1077.0	1145.0	1080.0	1160.0	1130.0	1215.0	1112.0	1107.5
ND: No data												
Bold indicates violations of the MADEP limits for Type 1 sludge. There were no violation of the federal limits.												

Table IV.B.2b Summary of Sludge Pellet Analysis, Calendar Year 2006												
Parameter	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06
Arsenic (mg/kg, dry weight)	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.1	3.8	3.8
Boron (mg/kg, dry weight)	ND	ND	ND	ND	ND	ND	ND	ND	ND	30	23.4	23.4
Cadmium (mg/kg, dry weight)	2.3	2.4	2.2	2.1	2.3	2.0	2.1	1.8	2.1	2.4	2.4	2.4
Chromium (mg/kg, dry weight)	46.5	55.5	64.4	58.9	61.9	73.4	66.9	62.7	55.0	68.3	72.4	71.8
Copper (mg/kg, dry weight)	653.8	665.5	651.6	613.0	643.8	624.5	583.0	628.0	648.5	628.0	604.0	424.6
Lead (mg/kg, dry weight)	174.5	195.3	159.2	140.0	169.0	219.0	226.0	212.4	200.3	153.0	173.2	164.3
Mercury (mg/kg, dry weight)	2.0	1.8	1.8	1.9	2.1	2.1	1.5	1.2	2.0	2.1	1.9	2.3
Molybdenum (mg/kg, dry weight)	11.7	10.2	9.7	13.1	17.0	16.4	21.8	22.3	27.2	27.0	27.6	17.1
Nickel (mg/kg, dry weight)	25.4	24.6	25.9	23.7	25.1	27.6	26.4	23.4	22.8	21.3	22.5	21.5
Selenium (mg/kg, dry weight)	4.8	4.7	3.9	4.7	5.8	5.4	6.2	5.6	4.8	5.8	4.5	5.4
Zinc (mg/kg, dry weight)	1155.0	1177.5	1126.0	1095.0	1185.0	1217.5	1152.0	1182.0	1200.0	1125.0	1120.0	1037.3
ND: No data												
Bold indicates violations of the MADEP limits for Type 1 sludge. There were no violation of the federal limits.												

V: Transport Systems

V.A.1 North System Headworks Choking

Figure V.A.1 below shows the number of hours of maintenance- and rain-related choking at the remote headworks since FY94. Testing and maintenance hours have steadily declined as the MWRA has completed the new DITP.

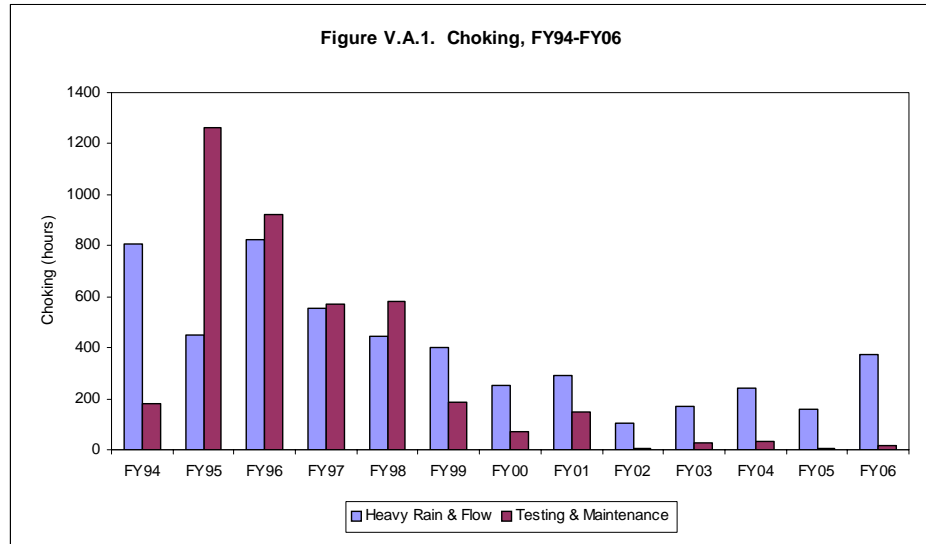
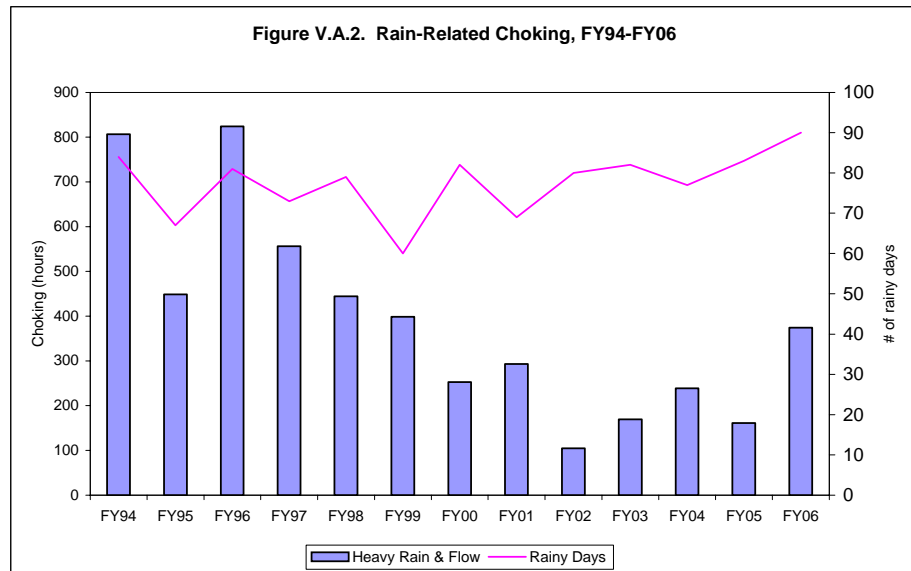
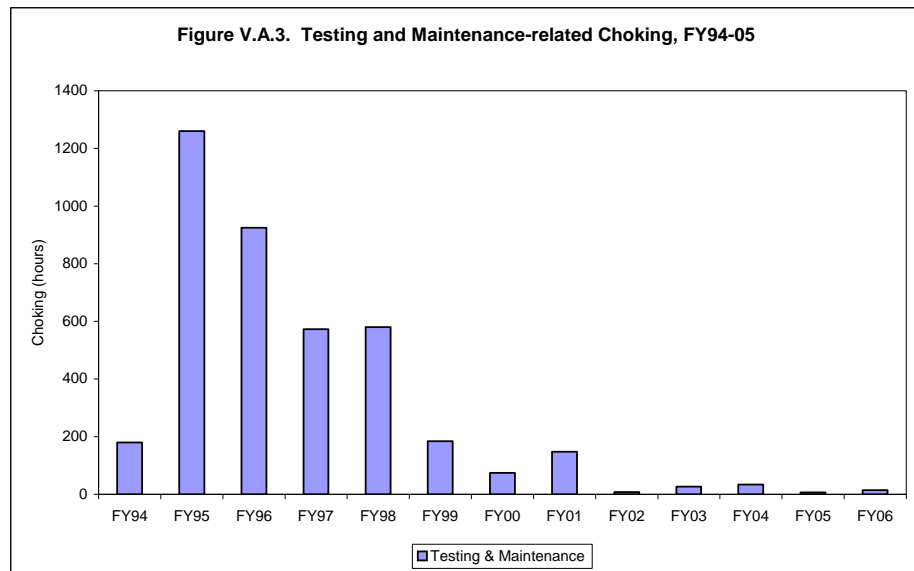


Figure V.A.2 shows the influence of the number of rainy days in a year on the hours of rain-related choking. A rainy day is defined as a day with greater than 0.09 inches of rainfall. Differences in storm intensity between the years can explain years that have similar amounts of rainy days yet vastly different choking hours (i.e., FY96 versus FY98 and the compare the years FY02-FY05, which have similar levels of rainfall but differing amounts of choking).



Choking for maintenance purposes is plotted in Figure V.A.3. Maintenance choking peaked in FY95 due to the maintenance and testing involved in bringing the new primary treatment plant on-line. From FY96 to FY98 the number of hours of maintenance-related choking continued to be fairly high because of maintenance and testing related to the startup of the new primary and secondary treatment plants. For example, in FY98, of the approximately 580 choking hours related to testing and maintenance, 442 hours were due to testing. Since there were no new systems to test in FY99, there was a significant decrease in the testing/maintenance choking hours from FY98 to FY99. Testing and maintenance increased in FY01 due to the finishing of both secondary Battery C and the outfall tunnel. With no new systems post-FY02, choking due to testing and maintenance fell to minimal levels.



**V.A.2
North System
Sanitary
Sewer
Overflows**

MWRA monitors sanitary sewer overflows (SSOs) visually and with meters in both the North and South Systems. SSOs occur when extreme rainfall overwhelms the transport system. Note that SSOs differ from CSOs (combined sewer overflows) in that CSO relief points are pipes that were specifically designed to relieve the combined sewer system. When the system becomes overloaded, these CSOs discharge combined sewage and storm water into a receiving body of water, such as the Charles River. SSOs, on the other hand, are weak points in the separate system, such as manholes, which will overflow during heavy rain events.

There were many reported overflows in FY06 for the North System (see Table V.A.1). Nearly all of these overflows were a result of the storms that moved through the metropolitan area in May and June of 2006. However, this count includes only overflows at MWRA-owned overflow areas. There may be overflows for which the local municipalities are responsible. MWRA monitors these local overflows less frequently, and only when notified by municipalities or concerned citizens. A list of all the known overflow locations in MWRA lines is provided in Appendix H, Table H-4.

Table V.A.1. Sanitary Sewer Overflows, North System, FY05-FY06		
Location	Number of Overflows	
	FY05	FY06
Pleasant Street, Watertown	1	
Alewife Brook Pump Station, Station 0+35		1
Section B, Station 31+00, Cambridge (Rt. 2 exit ramp)		1
Section B Cambridge (siphon)		1
Section C, Station 00+35, Medford (chamber)		3
Section C, Station 00+35, Medford (headhouse)		2
Section 15 Chelsea (Second St.)		1
Section 19, Station 4+24, Medford (headhouse)		1
Section 40 Malden (Charles St.)		1
Section 43.5, Station 9+12, Somerville (headhouse)		1
Section 44.5, Station 53+54, Winchester (manhole)		1
Section 51, Station 21+20, Melrose (manhole)		1
Section 51, Station 10+75, Melrose (manhole)		1
Section 91A Medford (manhole)		1
Section 91B, Station 31+24, Medford (headhouse)		2
Section 91B, Station 56+54, Arlington (manhole)		1
Section 107, Station 1+00, Mystic Valley Parkway		1
Section 107 Medford (siphon)		2
Section 113, Station 3+24, Winchester (siphon)		1
Section 113, Station 2+06, Winchester (siphon)		1
Section 222, Station 96+68 (manhole)		1
Section 222, Station 92+74 (manhole)		1

**V.B
South System
Sanitary
Sewer
Overflows**

There were a number of reported overflows in the South System in FY06 (see Table V.B.1). Like the North System SSOs, nearly all of the reported overflows were connected with the large storms that moved through the MWRA service area in May and June of 2006, late in the fiscal year.

Table V.B.1. Sanitary Sewer Overflows, South System, FY05-FY06		
Location	Number of Overflows	
	FY05	FY06
Station 3+15, Nut Island Headworks (emergency outfalls)		1
Station 0+40, Nut Island Headworks (spillway)		1
Section 570, Station 10+89, West Roxbury (north gates)		3
Section 570, Station 10+89, West Roxbury (south gates)		3
Section 626, Station 54+06, Weymouth (Smelt Brook)		3
Section 628 Braintree (Pearl St.)		3
Section 628A, Station 85+14, Randolph (headhouse siphon)		1

**V.C
Inflow and
Infiltration**

Inflow and infiltration (I/I) is a potentially serious problem that affects all sewerage systems. The NPDES permit requires the MWRA to address issues associated with I/I. Inflow is defined as the introduction of non-sanitary sewer water such as stormwater, residential basement pump-out, and industrial cooling water, into sanitary sewers. Infiltration is the leakage of groundwater into sewage lines through cracks, inadequately sealed joints, etc. In both cases, this additional load decreases system capacity, potentially leading to SSOs. I/I poses both a wet and dry weather problem; however, wet weather exacerbates I/I problems.

A summary of all actions minimizing I/I is prepared annually by MWRA. In addition, the MWRA participates in a Regional I/I Task Force responsible for creating a Regional I/I Reduction Plan for both MWRA and local community collection systems. The I/I Task Force includes MWRA staff, state regulators, and representatives from local communities. To reduce I/I, the MWRA “may consider incentive programs, rate structures, grant and loan programs, technical assistance and public education efforts as well as regulatory and enforcement mechanisms...” (permit section 18.bb.iv) At the end of FY03, MWRA submitted the Regional I/I Reduction Plan for regulatory review.

Find permit-related I/I materials at:

<http://www.mwra.state.ma.us/harbor/html/operations.htm>

VI: Miscellaneous NPDES Permit Requirements

Overview	<p>The MWRA's NPDES permit includes a number of other sections other than effluent quality for Deer Island and the CSO facilities, making it one of the most comprehensive permits ever issued by EPA.</p>
VI.A Facility Best Management Practices Plans	<p>Best Management Practices Plans (BMPs) are designed to minimize the environmental impact of MWRA facilities. The MWRA has developed plans for the following facilities:</p> <ul style="list-style-type: none">• Deer Island Treatment Plant• Nut Island Headworks• Ward Street Headworks• Columbus Park Headworks• Chelsea Creek Headworks• Cottage Farm CSO facility• Prison Point CSO facility• Somerville Marginal CSO facility• Fox Point CSO facility• Commercial Point CSO facility• Fore River Pelletizing Plant <p>The objectives of BMPs are “(1) minimize the potential for violations of the permit, (2) protect the designated water uses of the surrounding water bodies, and (3) mitigate pollution from materials storage areas, site runoff, improper use of waste disposal system, accidental spillage, etc.” (permit section 9.a)</p> <p>BMPs are available at the above facilities or at the MWRA offices in Charlestown.</p>
VI.B Water Conservation / Dry Day Flow Limit	<p>As described in the Executive Summary, one of the requirements of the permit is the adherence to a 436 MGD dry day flow limit. In FY06, the MWRA was well within compliance for this limit. See Figure 2 in the Executive Summary for details. If dry day flow reaches 415 MGD, MWRA cannot accept new connections larger than 1.4 MGD.</p> <p>Additionally, a report is prepared annually documenting the MWRA's demand management program. The demand management program, run with the cooperation of member communities, reviews historical water and wastewater use, and looks at the effectiveness of past and future conservation programs.</p> <p>Find permit-related water conservation and dry day flow limit materials at: http://www.mwra.state.ma.us/harbor/html/flow.htm</p>
VI.C Pollution Prevention	<p>The pollution prevention requirement of the permit requires MWRA to develop strategies to reduce pollutant loadings from households and permitted</p>

Program industries in the service area. The main target of the program is polychlorinated biphenyls, or PCBs, a known human carcinogen. Manufacture of PCBs has been banned for several decades; however, quantities remain in the environment. The other main aspect of the program is the development of educational materials regarding domestic household hazardous waste, with the aim of preventing those materials from entering the MWRA sewerage system through proper disposal techniques.

For more information on the MWRA's pollution prevention program, visit:
<http://www.mwra.state.ma.us/harbor/html/pollution.htm>

**VI.D
Groundwater
Remediation** Currently, groundwater remediation site waters cannot be discharged into the MWRA sewer system. If this prohibition is ever relaxed, a comprehensive assessment of its effects on the sewage system and treatment process is required. As of the end of FY06, no action has been taken on this section.

**VI.E
Local Limits
and Industrial
Pretreatment
Programs** These two related programs deal exclusively with non-domestic users, which are primarily industry. Under the local limits program, the MWRA develops and enforces specific limits on effluent from industrial users.

The industrial pretreatment program requires the MWRA to inspect and sample industrial users as specified by 40 CFR (Code of Federal Regulations) Part 403. 40 CFR Part 403 is designed as a source reduction program to limit the amount of pollutants in treatment plant influent.

Both programs result in cleaner influent to Deer Island, reducing stress on the plant, improving the efficiency of the treatment process, and reducing "pass-through" of contaminants to the effluent. Additionally, the sludge produced is cleaner and more amenable to safe fertilizer production.

More information on local limits and the pretreatment program is on-line at:
<http://www.mwra.state.ma.us/harbor/html/local.htm>

**VI.F
Reporting** Finally, the permit also requires the MWRA to provide the public with easy access to permit compliance reports and other information.

MWRA maintains a NPDES permit website at:
http://www.mwra.state.ma.us/harbor/html/ditp_performance.htm

EPA maintains an electronic mailing list for permit-related announcements:
<http://www.epa.gov/region1/eco/mwra/listserv.html>

Finally, there are two library repositories for permit documents:

MWRA Library
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129

Hyannis Public Library
401 Main Street
Hyannis, MA 02601

Appendix A

Table A-1	Deer Island Treatment Plant Operations Summary, Fiscal Year 2006
Table A-2	Deer Island Influent Characterization (North & South Systems), Fiscal Year 2006
Table A-3	Deer Island Influent Loadings (North & South Systems), Fiscal Year 2006
Table A-4	Deer Island Influent Characterization (North System), Fiscal Year 2006
Table A-5	Deer Island Influent Loadings (North System), Fiscal Year 2006
Table A-6	Deer Island Influent Characterization (South System), Fiscal Year 2006
Table A-7	Deer Island Influent Loadings (South System), Fiscal Year 2006
Table A-8	Deer Island Effluent Characterization, Fiscal Year 2006
Table A-9	Deer Island Effluent Loadings, Fiscal Year 2006
Table A-10	Deer Island Effluent Characterization (DEC), Fiscal Year 2006
Table A-11	Deer Island Effluent Loadings (DEC), Fiscal Year 2006

Table A-1. Deer Island Treatment Plant Operations Summary, FY06

North System Influent	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Annual Average	Max
Flow (mgd)															
Average	213.0	193.1	179.6	308.3	258.2	253.0	287.4	278.3	197.0	195.0	365.4	362.4		257.6	
Minimum	169.0	160.5	152.1	150.2	213.4	209.8	225.6	218.9	182.8	175.0	189.3	246.2	150.2		
Maximum	481.7	289.6	308.8	674.3	465.2	416.6	477.8	452.8	234.2	285.5	832.7	787.9			832.7
Temperature (deg F)															
Average	69.3	70.6	70.1	66.0	64.9	62.7	61.9	58.9	63.1	60.9	60.3	63.8		64.4	
Minimum	63.9	68.7	65.1	60.6	59.4	56.3	55.2	50.4	56.7	54.9	54.9	59.0	50.4		
Maximum	72.5	72.7	73.4	71.4	71.8	69.4	65.8	66.4	70.5	68.2	69.4	68.7			73.4
pH (SU)															
Average	6.9	6.9	6.9	7.0	7.0	7.0	6.8	7.0	6.9	6.9	6.8	6.8		6.9	
Minimum	6.7	6.5	6.6	6.6	6.6	6.6	6.6	6.7	6.4	6.5	6.6	6.5	6.4		
Maximum	7.1	7.2	7.2	7.3	7.2	7.4	7.1	7.4	7.1	7.1	7.0	7.2			7.4
North System Influent: Conventional Parameters (mg/L)															
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Annual Average	Max
Total Suspended Solids															
Average	180	209	204	177	151	171	131	163	176	218	154	138		173	
Minimum	96	63	88	59	58	94	50	66	136	117	68	76	50		
Maximum	276	368	298	350	210	388	216	330	224	490	312	276			490
cBOD															
Average	106	125	130	101	91	99	79	90	121	135	78	71		102	
Minimum	52	84	88	28	66	55	45	45	89	94	28	36	28		
Maximum	158	280	161	190	130	176	141	131	171	209	138	124			280
Settleable Solids (mL/L)															
Average	6.0	6.8	7.6	4.8	5.6	4.9	5.1	7.2	7.4	6.4	3.6	3.6		5.8	
Minimum	3.0	2.5	5.0	1.0	2.0	1.4	1.4	1.4	5.0	2.0	0.6	1.0	0.6		
Maximum	18.0	18.0	17.0	13.0	13.0	9.0	28.0	60.0	21.0	12.0	9.0	13.0			60.0
Total Solids															
Average	1653	1373	1747	1196	1114	1411	1387	1343	1532	1698	1460	1197		1426	
Minimum	1090	976	976	756	864	820	876	916	850	1180	668	564	564		
Maximum	2280	2440	2830	1710	1750	2630	1950	2370	2470	2390	2300	1710			2830
Volatile Solids															
Average	448	392	488	335	295	305	287	327	370	415	378	319		363	
Minimum	260	136	212	164	204	200	168	220	156	276	160	156	136		
Maximum	604	576	688	540	408	472	380	540	532	532	676	540			688
Volatile Suspended Solids															
Average	156	180	181	149	133	151	112	141	159	194	131	112		150	
Minimum	74	55	76	40	51	90	44	58	36	101	50	23	23		
Maximum	246	316	268	306	184	326	178	250	352	412	284	236			412

Table A-1. Deer Island Treatment Plant Operations Summary, FY06 (cont.)

North System Influent: Conventional Parameters (mg/L; cont.)													Annual		
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Average	Max
BOD															
Average	152	198	202	171	141	161	115	144	179	192	129	114	48	158	482
Minimum	67	103	79	64	87	99	62	77	107	136	48	60			
Maximum	205	468	482	366	202	331	183	265	257	267	210	259			
COD															
Average	381	448	429	359	323	387	284	344	446	443	279	242	123	364	1340
Minimum	252	264	274	129	209	216	175	172	240	332	123	125			
Maximum	724	1340	601	665	519	743	434	805	681	709	489	481			
Chloride															
Average	626	476	639	392	386	564	559	496	589	669	572	423	175	532	1380
Minimum	299	297	273	245	246	239	260	286	294	481	176	175			
Maximum	929	988	1140	566	738	1380	935	884	1030	1000	976	719			
North System Influent: Nutrients (mg/L)													Annual		
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Average	Max
Ammonia															
Average	15.8	20.5	23.8	17.2	14.3	16.9	12.5	16.6	19.7	21.2	12.5	10.1	3.9	16.7	27.0
Minimum	7.1	17.4	22.0	7.3	9.9	11.2	9.6	14.6	16.4	19.0	5.3	3.9			
Maximum	19.3	23.0	27.0	26.8	16.4	20.7	15.7	18.3	22.0	25.4	16.5	13.3			
Nitrite															
Average	0.14	0.17	0.15	1.14	0.13	0.27	0.39	0.21	0.29	0.02	0.16	0.06	0.01	0.26	4.45
Minimum	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.01	0.01	0.01	0.01	0.01			
Maximum	0.46	0.84	0.56	4.45	0.44	1.02	0.71	0.48	0.75	0.03	0.32	0.15			
Nitrate															
Average	0.02	0.02	0.01	0.21	0.02	0.01	0.26	0.76	0.03	0.02	0.48	0.21	0.01	0.17	2.02
Minimum	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01			
Maximum	0.04	0.09	0.01	0.63	0.09	0.01	0.76	2.02	0.13	0.04	1.99	0.77			
Total Kjeldahl Nitrogen															
Average	24.3	31.7	35.7	24.8	23.0	24.3	20.6	26.7	31.5	30.6	18.6	16.1	7.1	25.6	42.2
Minimum	16.5	27.6	30.9	13.2	16.2	18.0	16.9	25.0	28.4	28.6	9.5	7.1			
Maximum	33.6	36.0	42.2	38.3	25.6	29.0	23.5	28.2	33.9	34.3	23.9	21.5			
Orthophosphates															
Average	1.7	2.2	2.8	1.6	1.4	1.7	1.1	1.6	2.3	2.4	1.2	1.0	0.3	1.8	3.0
Minimum	0.5	1.9	2.6	0.5	0.9	0.9	0.6	1.3	1.7	2.0	0.3	0.3			
Maximum	2.1	2.5	3.0	2.8	1.8	2.4	1.5	2.0	2.9	2.8	1.9	1.6			
Total Phosphorus															
Average	3.5	4.2	5.1	3.6	3.6	3.7	2.6	4.1	4.5	4.6	2.9	2.4	1.0	3.7	5.6
Minimum	1.6	3.8	4.9	2.1	2.3	3.0	1.7	3.4	3.8	4.1	1.5	1.0			
Maximum	4.3	5.2	5.6	5.0	4.2	4.7	3.3	4.9	4.9	5.6	4.2	3.2			

Table A-1. Deer Island Treatment Plant Operations Summary, FY06 (cont.)

South System Influent	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Annual Average	Max
Flow (mgd)															
Average	103.0	88.6	84.4	178.6	152.1	145.9	171.4	159.7	100.3	90.7	180.0	212.4		138.9	
Minimum	80.6	77.6	78.5	78.4	126.4	121.5	138.4	116.7	90.3	84.2	88.5	126.5	77.6		
Maximum	139.6	109.8	108.0	353.0	232.3	177.5	212.5	261.2	114.9	97.5	377.6	364.2			377.6
Temperature (deg F)															
Average	65.4	68.6	69.1	67.2	62.0	57.6	54.9	53.2	54.1	57.8	58.4	62.4		60.9	
Minimum	51.1	65.8	67.3	61.2	58.1	54.5	50.7	50.5	51.3	54.7	55.0	58.5	50.5		
Maximum	74.5	70.2	70.5	74.5	72.1	66.4	66.2	59.9	58.8	66.0	77.9	79.7			79.7
pH (SU)															
Average	6.9	6.9	6.9	6.9	6.9	6.9	6.8	6.9	6.9	6.9	6.8	6.8		6.9	
Minimum	6.6	6.7	6.7	6.6	6.3	6.4	6.5	6.5	6.7	6.6	6.4	6.4	6.3		
Maximum	7.1	7.2	7.1	7.5	7.1	7.3	7.0	7.1	7.2	7.1	7.5	7.1			7.5
South System Influent: Conventional Parameters (mg/L)															
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Annual Average	Max
Total Suspended Solids															
Average	196	175	265	158	155	149	114	98	187	222	174	131		169	
Minimum	100	32	92	40	42	61	22	30	96	44	38	50	22		
Maximum	432	288	470	347	408	350	370	166	286	384	440	234			470
cBOD															
Average	114	109	138	94	77	84	58	61	123	122	71	54		92	
Minimum	61	63	98	24	43	47	28	18	74	89	16	25	16		
Maximum	167	155	179	229	135	128	94	88	189	158	131	89			229
Settleable Solids (mL/L)															
Average	7.8	8.4	11.5	8.1	8.5	6.5	6.9	4.9	8.4	10.9	6.4	4.5		7.7	
Minimum	3.0	4.0	7.0	0.7	2.6	3.7	4.0	2.0	1.3	7.0	1.8	1.2	0.7		
Maximum	24.0	18.0	23.0	19.0	26.0	19.0	28.0	7.0	14.0	17.0	15.0	9.0			28.0
Total Solids															
Average	1438	1430	1572	1219	939	948	883	916	1136	1267	1016	813		1131	
Minimum	1110	1040	1160	752	716	756	532	724	884	844	592	580	532		
Maximum	2120	2250	2210	2290	1260	1340	1760	1380	1590	1790	1490	1120			2290
Volatile Solids															
Average	427	393	516	388	279	254	227	233	329	387	316	247		333	
Minimum	312	208	276	156	120	120	120	164	216	168	120	128	120		
Maximum	660	640	912	1320	524	344	428	352	464	620	568	356			1320
Volatile Suspended Solids															
Average	169	150	264	171	136	128	97	85	163	197	147	109		151	
Minimum	84	30	82	5	38	34	22	26	85	38	32	42	5		
Maximum	374	230	820	1040	358	288	290	144	242	352	365	184			1040

Table A-1. Deer Island Treatment Plant Operations Summary, FY06 (cont.)

South System Influent: Conventional Parameters (mg/L; cont.)													Annual		
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Average	Max
BOD															
Average	165	173	214	166	122	131	89	92	179	181	124	94	25	144	705
Minimum	105	88	141	39	56	72	38	44	103	106	25	42			
Maximum	225	275	331	705	308	239	150	134	242	232	249	162			
COD															
Average	417	422	551	359	326	336	233	228	457	478	301	221	97	361	1890
Minimum	295	223	272	105	149	188	97	110	294	247	103	104			
Maximum	868	668	1890	948	820	600	553	436	734	881	639	403			
Chloride															
Average	532	526	503	383	311	318	317	320	380	423	338	262	130	384	949
Minimum	375	355	365	251	206	240	130	237	288	315	190	177			
Maximum	870	949	837	596	381	440	792	547	546	580	497	356			
South System Influent: Nutrients (mg/L)													Annual		
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Average	Max
Ammonia															
Average	37.2	43.5	47.3	34.4	24.3	32.8	28.9	28.2	45.2	48.5	29.8	19.9	12.8	35.0	59.3
Minimum	28.0	34.4	38.6	17.2	15.7	27.5	22.2	23.7	40.2	37.6	12.8	14.0			
Maximum	47.8	50.1	59.3	49.6	33.7	38.6	33.2	35.0	51.5	55.2	44.9	28.9			
Nitrite															
Average	0.01	0.01	0.01	0.01	0.01	0.02	0.10	0.16	0.01	0.01	0.11	0.20	0.01	0.05	0.49
Minimum	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
Maximum	0.01	0.01	0.01	0.01	0.01	0.07	0.18	0.44	0.03	0.01	0.28	0.49			
Nitrate															
Average	0.01	0.01	0.01	0.01	0.01	0.01	0.08	0.15	0.01	0.01	0.28	0.21	0.01	0.06	1.32
Minimum	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
Maximum	0.01	0.01	0.01	0.01	0.01	0.01	0.21	0.42	0.01	0.01	1.32	0.64			
Total Kjeldahl Nitrogen															
Average	39.9	57.6	64.1	46.2	33.2	44.1	34.6	35.8	61.0	63.2	40.6	27.9	7.9	45.7	73.9
Minimum	7.9	45.1	59.8	21.9	22.8	38.6	31.1	31.9	56.4	56.8	15.0	20.4			
Maximum	60.1	63.4	68.8	73.9	45.7	52.0	37.6	40.1	67.9	72.7	61.9	39.4			
Orthophosphates															
Average	3.8	4.6	5.3	3.7	2.2	3.1	2.5	2.7	4.4	4.4	2.4	1.7	0.8	3.4	6.4
Minimum	3.2	3.6	4.9	1.4	1.4	2.5	2.0	2.1	4.0	3.8	0.8	1.0			
Maximum	4.7	5.3	6.1	6.4	3.1	3.7	3.1	3.6	4.8	5.0	3.7	2.7			
Total Phosphorus															
Average	6.2	7.9	9.4	6.2	5.0	6.3	4.1	4.4	7.4	8.4	5.6	3.8	1.9	6.2	11.6
Minimum	5.3	6.0	8.1	2.6	3.0	5.4	3.9	4.0	7.1	6.1	1.9	2.4			
Maximum	7.3	9.6	10.6	10.4	7.1	7.2	4.3	5.1	8.2	11.6	8.9	5.3			

Table A-1. Deer Island Treatment Plant Operations Summary, FY06 (cont.)

Flow-Weighted Influent (North+South Systems): Conventional Parameters (mg/L)													Annual		
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Average	Max
Total Suspended Solids															
Average	185	198	224	170	152	163	124	139	180	220	161	136	124	171	224
cBOD															
Average	108	120	132	98	86	94	71	80	122	131	75	65	65	99	132
Settleable Solids (mL/L)															
Average	6.6	7.3	8.8	6.0	6.7	5.5	5.8	6.4	7.7	7.8	4.6	3.9	3.9	6.4	8.8
Total Solids															
Average	1583	1391	1691	1204	1049	1242	1199	1187	1399	1561	1314	1055	1049	1323	1691
Volatile Solids															
Average	441	392	497	355	289	286	265	293	356	406	358	293	265	353	497
Volatile Suspended Solids															
Average	160	171	207	157	134	142	106	121	160	195	136	111	106	150	207
BOD															
Average	156	190	206	169	134	150	105	125	179	188	128	107	105	153	206
COD															
Average	393	440	468	359	324	369	265	302	449	454	286	235	235	362	468
Chloride															
Average	596	492	595	389	358	474	468	432	518	591	495	363	358	481	596
Flow-Weighted Influent (North+South Systems): Nutrients (mg/L)													Annual		
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Average	Max
Ammonia															
Average	22.8	27.7	31.3	23.5	18.0	22.7	18.6	20.8	28.3	29.8	18.2	13.7	13.7	23.0	31.3
Nitrite															
Average	0.10	0.12	0.11	0.72	0.09	0.18	0.28	0.19	0.19	0.01	0.14	0.12	0.01	0.19	0.72
Nitrate															
Average	0.01	0.02	0.01	0.14	0.02	0.01	0.19	0.54	0.02	0.02	0.41	0.21	0.01	0.13	0.54
Total Kjeldahl Nitrogen															
Average	29.4	39.8	44.8	32.6	26.8	31.5	25.8	30.0	41.4	41.0	25.9	20.5	20.5	32.5	44.8
Orthophosphates															
Average	2.4	3.0	3.6	2.4	1.7	2.2	1.6	2.0	3.0	3.0	1.6	1.3	1.3	2.3	3.6
Total Phosphorus															
Average	4.4	5.4	6.5	4.5	4.1	4.7	3.2	4.2	5.4	5.8	3.8	2.9	2.9	4.6	6.5

Table A-1. Deer Island Treatment Plant Operations Summary, FY06 (cont.)

Final Effluent	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Annual Average	Max
Flow (mgd)															
Average	316.1	281.7	264.1	487.7	410.3	398.9	458.8	435.0	294.8	284.8	545.4	574.8		396.0	
Minimum	249.7	237.9	230.7	229.4	339.9	331.3	367.4	331.0	270.8	259.2	287.3	378.5	229.4		
Maximum	617.4	399.4	416.8	1046.1	697.5	586.1	668.3	684.7	336.3	379.4	1202.8	1123.5			1202.8
Temperature (deg F)															
Average	68.4	71.1	69.9	66.6	63.1	59.0	56.9	55.9	57.3	60.2	60.2	63.5		62.7	
Minimum	65.8	69.4	65.1	61.9	59.7	55.6	54.3	47.8	55.0	57.9	56.3	59.5	47.8		
Maximum	70.0	72.7	73.0	71.2	64.8	61.3	61.2	58.1	59.2	61.7	62.8	67.5			73.0
pH (SU)*															
Average	6.6	6.7	6.8	6.8	6.7	6.7	6.4	6.5	6.5	6.5	6.5	6.6		6.6	
Minimum	6.3	6.4	6.4	6.4	6.3	6.2	6.2	6.2	6.1	6.2	6.3	6.3	6.1		
Maximum	6.9	6.9	7.0	7.2	6.9	7.0	6.7	6.8	6.9	6.8	6.8	7.1			7.2
Final Effluent: Conventional Parameters (mg/L)															
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Annual Average	Max
Total Suspended Solids															
Average	7.1	7.8	9.8	10.4	8.7	9.9	10.0	8.9	8.0	8.9	12.6	10.2		9.4	
Minimum	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		
Maximum	22.0	17.0	61.0	31.5	24.0	19.5	26.0	19.5	11.5	20.5	37.5	22.5			61.0
cBOD															
Average	5.7	5.4	6.1	6.4	6.9	6.8	6.5	6.1	8.5	6.0	7.3	6.2		6.5	
Minimum	3.7	2.8	3.1	2.4	3.6	4.1	4.4	3.5	4.2	4.3	3.3	3.6	2.4		
Maximum	11.0	7.8	14.0	16.6	18.4	14.7	16.5	10.6	66.3	11.7	17.6	15.6			66.3
Settleable Solids (mL/L)															
Average	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		0.1	
Minimum	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
Maximum	0.1	0.1	1.0	0.2	0.2	0.2	0.4	0.3	0.1	0.1	0.1	0.6			1.0
Total Chlorine Residual*															
Average	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		0.04	
Minimum	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		
Maximum	0.06	0.21	0.04	0.06	0.08	0.06	0.17	0.04	0.04	0.07	0.05	0.04			0.21
Fecal Coliform (colonies/100mL)*															
Geometric Mean	6	6	10	30	11	10	10	9	6	6	18	17		10	
Minimum	5	5	5	6	5	5	5	5	5	5	5	7	5		
Maximum	14	11	278	403	31	292	75	48	19	19	426	199			426
Total Solids															
Average	1280	1325	1282	958	900	1018	1057	1035	1151	1135	1039	903		1090	
Minimum	864	852	1000	592	624	824	756	804	904	804	580	588	580		
Maximum	1970	2050	1880	1250	1070	1660	1630	1930	1570	1490	1300	1200			2050

Table A-1. Deer Island Treatment Plant Operations Summary, FY06 (cont.)

Final Effluent: Conventional Parameters (mg/L; cont.)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Annual Average	Max
Volatile Solids															
Average	249	237	199	139	136	125	147	165	169	176	190	178	40	176	
Minimum	144	108	92	60	76	40	80	96	68	116	100	84			
Maximum	400	336	396	284	196	212	324	340	332	256	352	296			400
Volatile Suspended Solids															
Average	6.3	6.9	8.8	8.9	7.8	8.9	8.6	7.6	7.0	7.7	10.5	8.3	3.5	8.1	
Minimum	5.0	5.0	5.0	4.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0			
Maximum	16.5	15.0	54.0	24.0	19.5	17.0	21.0	15.5	10.0	19.0	29.0	17.0			54.0
BOD															
Average	30.6	29.6	20.4	19.4	29.7	21.9	21.0	19.9	19.6	14.8	22.3	26.8		23.0	
Minimum	7.3	9.3	6.9	8.0	12.6	9.9	8.6	8.7	6.5	7.5	13.7	11.6	6.5		
Maximum	56.4	51.9	111.0	42.7	43.1	44.9	48.2	39.4	125.0	24.1	47.4	41.8			125.0
COD															
Average	69	68	82	63	56	63	55	57	108	63	57	50		66	
Minimum	41	51	58	38	41	41	40	45	55	51	37	33	33		
Maximum	100	96	131	113	78	102	84	72	604	83	86	75			604
Total Organic Carbon															
Average	13.1	23.6	25.4	25.1	16.7	11.7	10.9	10.6	16.0	15.2	15.8	10.0		16.2	
Minimum	12.4	22.2	23.8	24.0	15.6	11.5	9.9	9.7	14.3	14.2	13.9	9.1	9.1		
Maximum	13.7	25.0	27.0	26.1	17.7	11.9	12.0	11.5	17.7	16.2	17.7	10.8			27.0
Chloride															
Average	552	551	536	386	370	438	464	442	488	478	420	359		457	
Minimum	329	340	396	217	218	317	282	334	352	300	197	210	197		
Maximum	948	948	851	555	478	878	788	810	704	678	541	479			948
Fats, Oils, and Grease															
Average	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	
Minimum	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Maximum	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0			7.0

Table A-1. Deer Island Treatment Plant Operations Summary, FY06 (cont.)

Final Effluent: Nutrients (mg/L)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Min	Annual Average	Max
Ammonia															
Average	16.3	23.6	29.3	19.3	14.4	20.3	14.4	15.5	22.2	24.9	15.2	10.1	4.6	18.8	45.2
Minimum	11.1	18.4	25.3	8.7	10.4	10.3	11.8	4.6	13.3	16.5	7.2	4.8			
Maximum	19.5	28.2	45.2	32.1	19.7	29.8	20.0	19.6	26.2	29.1	19.8	15.4			
Nitrite															
Average	1.53	0.83	0.79	1.13	1.53	1.26	1.56	1.58	2.26	1.45	1.34	1.75	0.27	1.42	2.74
Minimum	0.86	0.70	0.42	0.27	0.45	0.83	1.32	1.05	1.16	1.21	0.46	1.23			
Maximum	2.29	1.08	1.16	1.59	2.26	1.99	1.82	2.54	2.74	1.68	2.09	2.10			
Nitrate															
Average	3.16	3.37	1.28	0.42	0.84	1.10	1.59	0.50	0.44	0.22	0.99	1.04	0.02	1.25	4.80
Minimum	2.34	0.26	0.85	0.02	0.43	0.77	1.34	0.10	0.24	0.11	0.05	0.80			
Maximum	3.94	4.80	1.67	1.12	1.32	1.31	1.90	0.89	0.66	0.42	2.16	1.45			
Total Kjeldahl Nitrogen															
Average	17.0	22.6	27.5	20.3	14.7	19.5	16.6	17.0	25.6	26.2	16.3	11.4	5.8	19.6	35.3
Minimum	13.5	20.0	24.4	9.0	10.2	11.4	14.0	6.7	23.1	17.2	8.5	5.8			
Maximum	21.1	26.4	30.1	35.3	20.4	24.5	20.9	22.3	29.4	31.9	21.2	17.4			
Orthophosphates															
Average	2.0	2.5	3.1	1.9	1.5	1.7	1.2	1.4	2.3	2.7	1.1	0.9	0.3	1.9	3.4
Minimum	1.5	2.3	3.0	0.6	1.0	1.3	0.9	1.0	2.2	2.3	0.3	0.4			
Maximum	2.3	2.8	3.3	3.4	2.0	2.3	1.7	1.7	2.5	3.3	1.7	1.3			
Total Phosphorus															
Average	2.7	3.0	3.5	2.3	1.9	2.2	1.6	1.8	2.8	3.0	1.6	1.3	0.7	2.3	3.9
Minimum	2.3	2.5	3.3	1.0	1.2	1.8	1.2	1.5	2.5	2.6	0.9	0.7			
Maximum	3.0	3.4	3.8	3.9	2.6	2.8	1.9	2.1	3.1	3.7	2.2	1.7			

~: No data collected

*: Effluent pH, TCR, and fecal coliform are sampled multiple times daily. The minimum and maximum are the minimum and maximum daily averages, not single sample minimums and maximums.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Table A-4. Deer Island Influent Characterization (North System), FY06 (cont.)

Semivolatile Organics (ug/L)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
1,2,4-TRICHLOROBENZENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
1,2-DICHLOROBENZENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
1,2-DIPHENYLHYDRAZINE (AS AZOBENZENE)	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
1,3-DICHLOROBENZENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
1,4-DICHLOROBENZENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2,2'-OXYBIS(1-CHLOROPROPANE)	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2,4,5-TRICHLOROPHENOL	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2,4,6-TRICHLOROPHENOL	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2,4-DICHLOROPHENOL	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2,4-DIMETHYLPHENOL	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2,4-DINITROPHENOL	2.15	2.31	2.06	2.17	2.18	2.29	2.09	2.13	2.09	2.1	2.43	2.13	2.18	2.63	0 of 26
2,4-DINITROTOLUENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2,6-DINITROTOLUENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2-CHLORONAPHTHALENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2-CHLOROPHENOL	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2-METHYL-4,6-DINITROPHENOL	10.8	11.5	10.3	10.8	10.9	11.4	10.4	10.6	10.5	10.5	12.2	10.6	10.9	13.2	0 of 26
2-METHYLNAPHTHALENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2-METHYLPHENOL	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2-NITROANILINE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
2-NITROPHENOL	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
3,3'-DICHLOROBENZIDINE	2.15	2.31	2.06	2.17	2.18	2.29	2.09	2.13	2.09	2.1	2.43	2.13	2.18	2.63	0 of 26
3-NITROANILINE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
4-BROMOPHENYL PHENYL ETHER	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
4-CHLORO-3-METHYLPHENOL	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
4-CHLOROANILINE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
4-CHLOROPHENYL PHENYL ETHER	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
4-METHYLPHENOL (INCLUDES 3-METHYLPHENOL)	54	25.4	23.4	27.4	9.17	12.2	18.3	1.06	29.3	47	11	9.23	22.6	179	24 of 26
4-NITROANILINE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
4-NITROPHENOL	2.15	2.31	2.06	2.17	2.18	2.29	2.09	2.13	2.09	2.1	2.43	2.13	2.18	2.63	0 of 26
ACENAPHTHENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
ACENAPHTHYLENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
ANILINE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
ANTHRACENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
BENZIDINE	5.39	5.76	5.15	5.42	5.46	5.72	5.22	5.32	5.23	5.24	6.09	5.32	5.46	6.58	0 of 26
BENZO(A)ANTHRACENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
BENZO(A)PYRENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
BENZO(B)FLUORANTHENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
BENZO(GH)PERYLENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
BENZO(K)FLUORANTHENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
BENZOIC ACID	2.15	7.03	8.54	2.17	8.15	2.29	31.6	2.13	36.1	95.9	2.43	2.13	14.6	110	8 of 26
BENZYL ALCOHOL	15.7	10.1	16.1	22.5	14.6	13.8	1.04	1.06	7.85	13.2	8.74	10.7	10.8	33.2	20 of 26
BIS(2-CHLOROETHOXY)METHANE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
BIS(2-CHLOROETHYL)ETHER	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
BIS(2-ETHYLHEXYL)PHTHALATE	15.4	12.7	19.8	15.7	10.9	4.94	7.36	5.53	9	11.5	13.6	8.61	10.4	29.6	23 of 26
BUTYL BENZYL PHTHALATE	1.08	3.44	1.03	5.42	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.45	10.3	2 of 26
CARBAZOLE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
CHRYSENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
DIBENZO(A,H)ANTHRACENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
DIBENZOFURAN	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
DIETHYL PHTHALATE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
DIMETHYL PHTHALATE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
DI-N-BUTYL PHTHALATE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
DI-N-OCTYL PHTHALATE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
FLUORANTHENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
FLUORENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
HEXACHLOROBENZENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
HEXACHLOROBUTADIENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
HEXACHLOROCYCLOPENTADIENE	5.39	5.76	5.15	5.42	5.46	5.72	5.22	5.32	5.23	5.24	6.09	5.32	5.46	6.58	0 of 26

Table A-4. Deer Island Influent Characterization (North System), FY06 (cont.)

Semivolatile Organics (ug/L)													Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
HEXACHLOROETHANE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
INDENO(1,2,3-CD)PYRENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
ISOPHORONE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
NAPHTHALENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
N-DECANE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
NITROBENZENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
N-NITROSODIMETHYLAMINE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
N-NITROSODI-N-PROPYLAMINE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
N-NITROSODIPHENYLAMINE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
N-OCTADECANE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
PENTACHLOROPHENOL	3.23	3.46	3.09	3.25	3.27	3.43	3.13	3.19	3.14	3.15	3.65	3.19	3.28	3.95	0 of 26
PHENANTHRENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26
PHENOL	2.15	6.93	2.06	2.17	2.18	2.29	2.09	2.13	2.09	8.63	2.43	2.13	2.94	14.6	2 of 26
PYRENE	1.08	1.15	1.03	1.08	1.09	1.14	1.04	1.06	1.05	1.05	1.22	1.06	1.09	1.32	0 of 26

Volatile Organics (ug/L)													Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
1,1,1-TRICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
1,1,2,2-TETRACHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
1,1,2-TRICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
1,1-DICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
1,1-DICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
1,2-DICHLOROETHANE	0.5	4.08	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.685	7.68	1 of 26
1,2-DICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
1,2-DICHLOROPROPANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
1,3-DICHLOROBENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
1,4-DICHLOROBENZENE	0.5	2	0.5	1.45	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.621	3.51	2 of 26
2-BUTANONE	2.53	4.45	8.61	0.5	4.26	0.5	10.2	0.5	5.73	0.5	3.63	0.5	3.14	14.7	11 of 26
2-CHLOROETHYL VINYL ETHER	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
2-HEXANONE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
4-METHYL-2-PENTANONE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
ACETONE	71.8	103	151	196	115	88.4	173	48.9	128	72.9	94.4	45.1	95.2	229	25 of 26
ACROLEIN	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0 of 26
ACRYLONITRILE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0 of 26
BENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
BROMODICHLOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
BROMOFORM	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
BROMOMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
CARBON DISULFIDE	0.5	0.5	1.96	0.5	0.5	0.5	0.5	0.5	0.5	1.63	0.5	0.5	0.676	2.86	2 of 26
CARBON TETRACHLORIDE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
CHLOROBENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
CHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
CHLOROFORM	5.17	5.3	1.26	3.46	0.5	0.5	0.5	0.5	4.13	0.5	1.67	0.5	1.93	10.2	11 of 26
CHLOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
CIS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
CIS-1,3-DICHLOROPROPENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
DIBROMOCHLOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
ETHYLBENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
M,P-XYLENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0 of 26
METHYLENE CHLORIDE	2.07	0.5	2.09	3.42	0.5	0.5	0.5	0.753	0.677	0.635	3.17	0.58	1.3	5.34	13 of 26
O-XYLENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
STYRENE	0.5	0.5	0.5	6.97	0.5	0.5	0.5	0.5	0.5	0.5	0.5	3.44	1.28	10.1	3 of 26
TETRACHLOROETHENE	1.99	3.9	6.14	1.99	1.34	0.5	4	0.5	1.95	4.42	1.59	2.99	2.51	15.9	13 of 26
TOLUENE	6.41	6.47	17.7	6.51	1.76	2.92	3.62	0.5	2.21	8.44	7.33	0.5	4.93	19.8	20 of 26
TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
TRANS-1,3-DICHLOROPROPENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
TRICHLOROETHENE	1.55	0.5	0.5	0.5	1.93	0.5	3.22	0.5	0.5	1.48	0.5	1.43	1.16	3.54	7 of 26
TRICHLOROFLUOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
VINYL ACETATE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26
VINYL CHLORIDE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26

Notes

-: No data or no samples taken

Results in **bold** indicate one or more detects that month

Yearly averages are calculated from individual results collected during the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Table A-5. Deer Island Influent Loadings (North System), FY06 (cont.)

Semivolatile Organics (lbs/day)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
1,2,4-TRICHLOROBENZENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
1,2-DICHLOROBENZENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
1,2-DIPHENYLHYDRAZINE (AS AZOBENZENE)	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
1,3-DICHLOROBENZENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
1,4-DICHLOROBENZENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2,2'-OXYBIS(1-CHLOROPROPANE)	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2,4,5-TRICHLOROPHENOL	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2,4,6-TRICHLOROPHENOL	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2,4-DICHLOROPHENOL	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2,4-DIMETHYLPHENOL	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2,4-DINITROPHENOL	3.95	3.49	2.99	2.86	4.13	4.53	3.99	6.04	3.42	4.04	7.26	5.78	4.34	9.14	0 of 26
2,4-DINITROTOLUENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2,6-DINITROTOLUENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2-CHLORONAPHTHALENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2-CHLOROPHENOL	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2-METHYL-4,6-DINITROPHENOL	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2-METHYLNAPHTHALENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2-METHYLPHENOL	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2-NITROANILINE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
2-NITROPHENOL	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
3,3'-DICHLOROBENZIDINE	3.95	3.49	2.99	2.86	4.13	4.53	3.99	6.04	3.42	4.04	7.26	5.78	4.34	9.14	0 of 26
3-NITROANILINE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
4-BROMOPHENYL PHENYL ETHER	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
4-CHLORO-3-METHYLPHENOL	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
4-CHLOROANILINE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
4-CHLOROPHENYL PHENYL ETHER	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
4-METHYLPHENOL (INCLUDES 3-METHYLPHENOL)	99.2	38.4	33.9	36.1	17.3	24.2	35	3.02	47.9	90.6	32.8	25.1	44.8	319	24 of 26
4-NITROANILINE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
4-NITROPHENOL	3.95	3.49	2.99	2.86	4.13	4.53	3.99	6.04	3.42	4.04	7.26	5.78	4.34	9.14	0 of 26
ACENAPHTHENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
ACENAPHTHYLENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
ANILINE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
ANTHRACENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
BENZIDINE	9.89	8.72	7.47	7.15	10.3	11.3	9.98	15.1	8.54	10.1	18.1	14.5	10.9	22.9	0 of 26
BENZO(A)ANTHRACENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
BENZO(A)PYRENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
BENZO(B)FLUORANTHENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
BENZO(GH)PERYLENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
BENZO(K)FLUORANTHENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
BENZOIC ACID	3.95	10.6	12.4	2.86	15.4	4.53	60.5	6.04	59	185	7.26	5.78	29	222	8 of 26
BENZYL ALCOHOL	28.9	15.3	23.4	29.6	27.7	27.4	2	3.02	12.8	25.4	26.1	29	21.5	41.6	20 of 26
BIS(2-CHLOROETHOXY)METHANE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
BIS(2-CHLOROETHYL)ETHER	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
BIS(2-ETHYLHEXYL)PHTHALATE	28.3	19.2	28.7	20.8	2.06	9.78	14.1	15.7	14.7	22.2	40.6	23.4	20.6	62.7	23 of 26
BUTYL BENZYL PHTHALATE	1.98	5.21	1.49	7.16	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.88	12.9	2 of 26
CARBAZOLE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
CHRYSENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
DIBENZO(A,H)ANTHRACENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
DIBENZOFURAN	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
DIETHYL PHTHALATE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
DIMETHYL PHTHALATE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
DI-N-BUTYLPHTHALATE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
DI-N-OCTYLPHTHALATE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
FLUORANTHENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
FLUORENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
HEXACHLOROBENZENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
HEXACHLOROBUTADIENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
HEXACHLOROCYCLOPENTADIENE	9.89	8.72	7.47	7.15	10.3	11.3	9.98	15.1	8.54	10.1	18.1	14.5	10.9	22.9	0 of 26

Table A-5. Deer Island Influent Loadings (North System), FY06 (cont.)

Semivolatile Organics (lbs/day)													Times		
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Detected
HEXACHLOROETHANE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
INDENO(1,2,3-CD)PYRENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
ISOPHORONE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
NAPHTHALENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
N-DECANE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
NITROBENZENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
N-NITROSODIMETHYLAMINE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
N-NITROSODI-N-PROPYLAMINE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
N-NITROSODIPHENYLAMINE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
N-OCTADECANE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
PENTACHLOROPHENOL	5.93	5.23	4.48	4.29	6.19	6.79	5.99	9.06	5.12	6.07	10.9	8.68	6.51	13.7	0 of 26
PHENANTHRENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
PHENOL	3.95	10.5	2.99	2.86	4.13	4.53	3.99	6.04	3.42	16.6	7.26	5.78	5.85	29.3	2 of 26
PYRENE	1.98	1.74	1.49	1.43	2.06	2.26	2	3.02	1.71	2.02	3.63	2.89	2.17	4.57	0 of 26
Volatile Organics (lbs/day)													Times		
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Detected
1,1,1-TRICHLOROETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
1,1,2,2-TETRACHLOROETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
1,1,2-TRICHLOROETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
1,1-DICHLOROETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
1,1-DICHLOROETHENE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
1,2-DICHLOROBENZENE	1.05	6.16	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.54	11.6	1 of 26
1,2-DICHLOROETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
1,2-DICHLOROPROPANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
1,3-DICHLOROBENZENE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
1,4-DICHLOROBENZENE	1.05	3.02	1.02	1.95	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.4	5.28	2 of 26
2-BUTANONE	5.31	6.71	17.5	0.674	9.38	0.976	20.9	1.32	9.43	0.964	10.8	2.37	7.05	24.5	11 of 26
2-CHLOROETHYL VINYL ETHER	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
2-HEXANONE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
4-METHYL-2-PENTANONE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
ACETONE	151	155	307	264	253	172	355	129	210	141	282	214	214	505	25 of 26
ACROLEIN	2.1	1.51	2.04	1.35	2.21	1.95	2.04	2.64	1.64	1.93	2.98	4.74	2.25	6.58	0 of 26
ACRYLONITRILE	2.1	1.51	2.04	1.35	2.21	1.95	2.04	2.64	1.64	1.93	2.98	4.74	2.25	6.58	0 of 26
BENZENE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
BROMODICHLOROMETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
BROMOFORM	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
BROMOMETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
CARBON DISULFIDE	1.05	0.754	3.99	0.674	1.1	0.976	1.02	1.32	0.822	3.14	1.49	2.37	1.52	7.24	2 of 26
CARBON TETRACHLORIDE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
CHLOROBENZENE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
CHLOROETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
CHLOROFORM	10.8	7.99	2.56	4.67	1.1	0.976	1.02	1.32	6.79	0.964	4.98	2.37	4.34	17.6	11 of 26
CHLOROMETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
CIS-1,2-DICHLOROETHENE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
CIS-1,3-DICHLOROPROPENE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
DIBROMOCHLOROMETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
ETHYLBENZENE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
M,P-XYLENE	2.1	1.51	2.04	1.35	2.21	1.95	2.04	2.64	1.64	1.93	2.98	4.74	2.25	6.58	0 of 26
METHYLENE CHLORIDE	4.35	0.754	4.25	4.61	1.1	0.976	1.02	1.99	1.11	1.23	9.45	2.75	2.92	16.6	13 of 26
O-XYLENE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
STYRENE	1.05	0.754	1.02	9.4	1.1	0.976	1.02	1.32	0.822	0.964	1.49	16.3	2.87	29.3	3 of 26
TETRACHLOROETHENE	4.18	5.88	12.5	2.69	2.96	0.976	8.17	1.32	3.21	8.52	4.74	14.2	5.65	23.7	13 of 26
TOLUENE	13.5	9.75	36.1	8.77	3.89	5.71	7.4	1.32	3.63	16.3	21.9	2.37	11.1	50.9	20 of 26
TRANS-1,2-DICHLOROETHENE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
TRANS-1,3-DICHLOROPROPENE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
TRICHLOROETHENE	3.25	0.754	1.02	0.674	4.25	0.976	6.58	1.32	0.822	2.86	1.49	6.78	2.62	10.3	7 of 26
TRICHLOROFLUOROMETHANE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
VINYL ACETATE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26
VINYL CHLORIDE	1.05	0.754	1.02	0.674	1.1	0.976	1.02	1.32	0.822	0.964	1.49	2.37	1.12	3.29	0 of 26

Notes

-: No data or no samples taken

Results in **bold** indicate one or more detects that month

Yearly averages are calculated from individual results collected during the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Table A-6. Deer Island Influent Characterization (South System), FY06

Metals (ug/L)														Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun				
ANTIMONY	12.5	21.3	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	13	30.2	1 of 26	
ARSENIC	0.712	0.4	1.04	0.4	0.4	0.4	0.4	0.4	0.4	0.665	2.22	0.4	0.617	3.59	6 of 26	
BERYLLIUM	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0 of 26	
BORON	125	279	253	298	125	125	125	125	125	125	181	125	151	306	7 of 26	
CADMIUM	0.457	0.484	0.712	0.387	0.274	0.336	0.347	0.294	0.341	0.393	0.921	0.47	0.432	1.09	26 of 26	
CHROMIUM	4.18	4.11	7.64	3.36	2.09	4.16	3.79	2.37	3.08	6.93	9.91	4.43	4.36	12	26 of 26	
COPPER	83.6	101	191	98	43.6	101	57.1	29.6	57.2	91.3	197	57.8	82.3	245	24 of 24	
HEXAVALENT CHROMIUM	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0 of 26	
IRON	2910	2720	5190	2540	1610	1510	1980	1280	1810	2550	6160	2220	2510	7530	26 of 26	
LEAD	10	9.09	18.7	7.02	3.79	4.84	4.93	3.54	4.16	16.2	21.6	9.22	8.62	26.5	24 of 26	
MERCURY	0.253	0.194	0.367	0.193	0.005	0.209	0.102	0.0756	0.093	0.198	0.364	0.194	0.172	0.395	22 of 24	
MOLYBDENUM	5.84	8.85	9.96	5.4	2.79	6.45	3.61	1.95	2.66	7.13	8.86	3.72	5.07	11.5	26 of 26	
NICKEL	3.8	4.73	7.41	3.93	2.74	3.15	2.63	2.47	3.54	5.61	6.48	3.44	3.83	8.8	26 of 26	
SELENIUM	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0 of 26	
SILVER	1.8	2.22	4.47	2.69	1.54	1.81	1.61	0.662	1.16	2.08	4.42	1.22	1.89	5.25	26 of 26	
THALLIUM	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
ZINC	160	169	312	175	76.5	118	104	70.3	104	172	353	118	146.00	430.00	26 of 26	

Cyanide (ug/L)														Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun				
CYANIDE	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0 of 26	

Oil and Grease, Surfactants, and Petroleum Hydrocarbons (mg/L)														Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun				
FATS OIL AND GREASE	36.6	35.7	64.2	62.2	55.2	29.5	28.1	17.1	34.6	17.1	36.8	15.2	31.7	77.4	25 of 26	
MBAS	3.7	5.69	5.58	5.8	3.12	2.85	3.26	1.68	4.4	4.58	4.19	1.75	3.45	6.24	26 of 26	
PETROLEUM HYDROCARBON	2.2	1.17	1.68	3.63	1.08	0.869	1.31	4.71	1.12	4.3	1.88	1.98	2.24	9.21	25 of 25	

Organochlorine Pesticides and PCBs (ug/L)														Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun				
4,4'-DDD	0.00221	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0024	0.00229	0.00224	0.00274	0 of 26	
4,4'-DDE	0.00267	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0024	0.00229	0.00224	0.00387	1 of 26	
4,4'-DDT	0.00221	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0024	0.00229	0.00224	0.00274	0 of 26	
ALDRIN	0.00165	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0012	0.00114	0.00193	0.00274	0 of 26	
ALPHA-BHC	0.00165	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0012	0.00114	0.00193	0.00274	0 of 26	
ALPHA-CHLORDANE	0.00397	0.00219	0.00245	0.0112	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0012	0.00114	0.00269	0.0202	2 of 26	
AROCLOR-1016	0.0829	0.0549	0.0614	0.0598	0.0541	0.0521	0.0569	0.055	0.0536	0.0556	0.12	0.114	0.0711	0.125	0 of 26	
AROCLOR-1221	0.166	0.11	0.123	0.12	0.108	0.104	0.114	0.11	0.107	0.111	0.24	0.229	0.142	0.25	0 of 26	
AROCLOR-1232	0.0829	0.0549	0.0614	0.0598	0.0541	0.0521	0.0569	0.055	0.0536	0.0556	0.12	0.114	0.0711	0.125	0 of 26	
AROCLOR-1242	0.0829	0.0549	0.0614	0.0598	0.0541	0.0521	0.0569	0.055	0.0536	0.0556	0.12	0.114	0.0711	0.125	0 of 26	
AROCLOR-1248	0.0829	0.0549	0.0614	0.0598	0.0541	0.0521	0.0569	0.055	0.0536	0.0556	0.12	0.114	0.0711	0.125	0 of 26	
AROCLOR-1254	0.0829	0.0549	0.0614	0.0598	0.0541	0.0521	0.0569	0.055	0.0536	0.0556	0.12	0.114	0.0711	0.125	0 of 26	
AROCLOR-1260	0.0829	0.0549	0.0614	0.0598	0.0541	0.0521	0.0569	0.055	0.0536	0.0556	0.12	0.114	0.0711	0.125	0 of 26	
BETA-BHC	0.00165	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0012	0.00114	0.00193	0.00274	0 of 26	
CHLORDANE (TECHNICAL)	0.0551	0.0549	0.0614	0.0598	0.0541	0.0521	0.0569	0.055	0.0536	0.0556	0.0601	0.0571	0.0559	0.0685	0 of 26	
DELTA-BHC	0.00165	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0012	0.00114	0.00193	0.00274	0 of 26	
DIELDRIN	0.00221	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0024	0.00229	0.00224	0.00274	0 of 26	
ENDOSULFAN I	0.00165	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0012	0.00114	0.00193	0.00274	0 of 26	
ENDOSULFAN II	0.00221	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0024	0.00229	0.00224	0.00274	0 of 26	
ENDOSULFAN SULFATE	0.00221	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0024	0.00229	0.00224	0.00274	0 of 26	
ENDRIN	0.00221	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0024	0.00229	0.00224	0.00274	0 of 26	
ENDRIN ALDEHYDE	0.00221	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0024	0.00229	0.00224	0.00274	0 of 26	
ENDRIN KETONE	0.00221	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0024	0.00229	0.00224	0.00274	0 of 26	
GAMMA-BHC (LINDANE)	0.00165	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0012	0.00114	0.00193	0.00274	0 of 26	
GAMMA-CHLORDANE	0.00423	0.00219	0.00245	0.014	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0012	0.00114	0.00286	0.0258	2 of 26	
HEPTACHLOR	0.00165	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0012	0.00114	0.00193	0.00274	0 of 26	
HEPTACHLOR EPOXIDE	0.00165	0.00219	0.00245	0.00239	0.00217	0.00208	0.00228	0.0022	0.00214	0.00222	0.0012	0.00114	0.00193	0.00274	0 of 26	
METHOXYCHLOR	0.0165	0.0219	0.0245	0.0239	0.0217	0.0208	0.0228	0.022	0.0214	0.0222	0.012	0.0114	0.0193	0.0274	0 of 26	
TOXAPHENE	0.0551	0.0549	0.0614	0.0598	0.0541	0.0521	0.0569	0.055	0.0536	0.0556	0.0601	0.0571	0.0559	0.0685	0 of 26	

Table A-6. Deer Island Influent Characterization (South System), FY06 (cont.)

Semivolatile Organics (ug/L)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
1,2,4-TRICHLOROBENZENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
1,2-DICHLOROBENZENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
1,2-DIPHENYLHYDRAZINE (AS AZOBENZENE)	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
1,3-DICHLOROBENZENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
1,4-DICHLOROBENZENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2,2'-OXYBIS(1-CHLOROPROPANE)	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2,4,5-TRICHLOROPHENOL	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2,4,6-TRICHLOROPHENOL	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2,4-DICHLOROPHENOL	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2,4-DIMETHYLPHENOL	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2,4-DINITROPHENOL	2.1	2.41	2.1	2.4	2.17	2.19	2.08	2.19	2.17	2.21	2.35	2.29	2.21	2.74	0 of 26
2,4-DINITROTOLUENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2,6-DINITROTOLUENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2-CHLORONAPHTHALENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2-CHLOROPHENOL	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2-METHYL-4,6-DINITROPHENOL	10.5	12.1	10.5	12	10.9	11	10.4	11	10.9	11.1	11.8	11.5	11	13.7	0 of 26
2-METHYLNAPHTHALENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2-METHYLPHENOL	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2-NITROANILINE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
2-NITROPHENOL	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
3,3'-DICHLOROBENZIDINE	2.1	2.41	2.1	2.4	2.17	2.19	2.08	2.19	2.17	2.21	2.35	2.29	2.21	2.74	0 of 26
3-NITROANILINE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
4-BROMOPHENYL PHENYL ETHER	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
4-CHLORO-3-METHYLPHENOL	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
4-CHLOROANILINE	1.05	1.21	1.05	4.12	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.25	6.9	1 of 26
4-CHLOROPHENYL PHENYL ETHER	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
4-METHYLPHENOL (INCLUDES 3-METHYLPHENOL)	10.4	17.9	40.5	48.6	3.38	1.1	8.72	1.1	19.3	39.1	37.4	1.15	14.2	60.5	18 of 26
4-NITROANILINE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
4-NITROPHENOL	2.1	2.41	2.1	2.4	2.17	2.19	2.08	2.19	2.17	2.21	2.35	2.29	2.21	2.74	0 of 26
ACENAPHTHENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
ACENAPHTHYLENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
ANILINE	1.05	1.21	1.05	10.6	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.56	11	2 of 26
ANTHRACENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
BENZIDINE	5.25	6.03	5.25	6.01	5.43	5.48	5.2	5.48	5.43	5.53	5.89	5.73	5.52	6.85	0 of 26
BENZO(A)ANTHRACENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
BENZO(A)PYRENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
BENZO(B)FLUORANTHENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
BENZO(GH)PERYLENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
BENZO(K)FLUORANTHENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
BENZOIC ACID	7.63	2.41	8.52	7.35	2.17	2.19	2.08	2.19	2.17	89.3	11.9	2.29	9.17	124	6 of 26
BENZYL ALCOHOL	11.6	5.48	15.7	8.5	4.22	3.92	1.04	1.1	12.4	13.3	14.2	1.15	6.74	24	16 of 26
BIS(2-CHLOROETHOXY)METHANE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
BIS(2-CHLOROETHYL)ETHER	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
BIS(2-ETHYLHEXYL)PHTHALATE	11.1	14.8	31.1	18.9	1.09	3.81	8.33	1.1	8.02	14.4	20.7	9.12	9.97	32.7	21 of 26
BUTYL BENZYL PHTHALATE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
CARBAZOLE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
CHRYSENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
DIBENZO(A,H)ANTHRACENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
DIBENZOFURAN	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
DIETHYL PHTHALATE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
DIMETHYL PHTHALATE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
DI-N-BUTYLPHTHALATE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
DI-N-OCTYLPHTHALATE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
FLUORANTHENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
FLUORENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
HEXACHLOROBENZENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
HEXACHLOROBUTADIENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26
HEXACHLOROCYCLOPENTADIENE	5.25	6.03	5.25	6.01	5.43	5.48	5.2	5.48	5.43	5.53	5.89	5.73	5.52	6.85	0 of 26

Table A-6. Deer Island Influent Characterization (South System), FY06 (cont.)

Semivolatile Organics (ug/L)													Average	Maximum	Times Detected	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun				
HEXACHLOROETHANE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
INDENO(1,2,3-CD)PYRENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
ISOPHORONE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
NAPHTHALENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
N-DECANE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
NITROBENZENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
N-NITROSODIMETHYLAMINE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
N-NITROSODI-N-PROPYLAMINE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
N-NITROSODIPHENYLAMINE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
N-OCTADECANE	1.05	1.21	1.05	3.37	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	5.41	1 of 26	
PENTACHLOROPHENOL	3.15	3.62	3.15	3.6	3.26	3.29	3.12	3.29	3.26	3.32	3.53	3.44	3.31	4.11	0 of 26	
PHENANTHRENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
PHENOL	2.1	2.41	17.3	15.2	2.17	2.19	2.08	2.19	2.17	7.77	8.61	2.29	4.31	17.6	6 of 26	
PYRENE	1.05	1.21	1.05	1.2	1.09	1.1	1.04	1.1	1.09	1.11	1.18	1.15	1.1	1.37	0 of 26	
Volatile Organics (ug/L)																
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected	
1,1,1-TRICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
1,1,2,2-TETRACHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
1,1,2-TRICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
1,1-DICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
1,1-DICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
1,2-DICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
1,2-DICHLOROPROPANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
1,3-DICHLOROBENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
1,4-DICHLOROBENZENE	2.08	4.03	3.17	1.57	0.5	0.5	0.5	0.5	0.5	0.5	1.5	0.5	1.15	4.55	8 of 26	
2-BUTANONE	7.67	2.66	15.9	0.5	0.5	0.5	4.41	3.08	12.4	7.43	9.63	12.1	6.6	20.5	15 of 26	
2-CHLOROETHYL VINYL ETHER	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
2-HEXANONE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
4-METHYL-2-PENTANONE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.64	0.5	0.591	2.86	1 of 26	
ACETONE	78.8	69	103	73.1	102	60	83.8	69.8	77	46.3	94.4	93.9	80.5	145	24 of 26	
ACROLEIN	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0 of 26	
ACRYLONITRILE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0 of 26	
BENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
BROMODICHLOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
BROMOFORM	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
BROMOMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
CARBON DISULFIDE	1.73	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.666	5.49	1 of 26	
CARBON TETRACHLORIDE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
CHLOROBENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
CHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
CHLOROFORM	5.32	1.8	3.26	4.02	0.5	0.5	0.5	0.5	0.5	1.66	1.58	0.5	1.67	8.71	11 of 26	
CHLOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
CIS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
CIS-1,3-DICHLOROPROPENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
DIBROMOCHLOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
ETHYLBENZENE	3.24	0.5	1.76	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.928	11.2	2 of 26	
M,P-XYLENE	6.59	1	6.06	1	1	1	1	1	1	1	1	1	1.99	22.9	2 of 26	
METHYLENE CHLORIDE	3.02	1.65	1.96	2.73	1.29	0.871	1.38	0.5	1.1	0.968	0.635	0.764	1.36	4.97	17 of 26	
O-XYLENE	3.03	0.5	1.98	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.911	10.4	2 of 26	
STYRENE	1.93	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.694	3.58	2 of 26	
TETRACHLOROETHENE	1.58	1.66	4.39	0.5	2.37	1.68	2.02	3.35	3.37	7.78	7.82	3.93	3.32	15.1	16 of 26	
TOLUENE	11.6	6.41	5.97	7.58	1.76	2.04	0.5	0.5	3.19	2.88	7.04	0.5	3.94	35.5	16 of 26	
TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
TRANS-1,3-DICHLOROPROPENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
TRICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
TRICHLOROFLUOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
VINYL ACETATE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	
VINYL CHLORIDE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 26	

Notes

~: No data or no samples taken

Results in **bold** indicate one or more detects that month

Yearly averages are calculated from individual results collected during the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Table A-7. Deer Island Influent Loadings (South System), FY06

Metals (lbs/day)													Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
ANTIMONY	12	15.3	8.2	8.28	14.4	15.1	15	22.9	11.2	9.74	11.9	21	13.6	24.3	1 of 26
ARSENIC	0.685	0.287	0.684	0.265	0.461	0.483	0.481	0.733	0.357	0.518	2.12	0.673	0.649	3.92	6 of 26
BERYLLIUM	0.241	0.179	0.164	0.166	0.288	0.302	0.3	0.458	0.223	0.195	0.239	0.421	0.263	0.485	0 of 26
BORON	120	200	166	197	144	151	150	229	112	97.4	172	210	159	243	7 of 26
CADMIUM	0.44	0.347	0.467	0.256	0.316	0.406	0.417	0.539	0.305	0.306	0.88	0.79	0.454	1.19	26 of 26
CHROMIUM	4.02	2.95	5.01	2.23	2.41	5.02	4.55	4.34	2.75	5.4	9.46	7.45	4.59	13.1	26 of 26
COPPER	82.8	72.3	125	64.9	50.3	122	68.6	54.2	51.1	71.2	189	97.3	87.4	268	24 of 24
HEXAVALENT CHROMIUM	2.38	1.79	1.64	1.66	2.88	2.91	2.93	4.12	2.21	2.03	2.84	5.52	2.71	7	0 of 26
IRON	2800	1950	3400	1680	1850	1830	2380	2350	1620	1990	5880	3730	2630	8220	26 of 26
LEAD	9.62	6.51	12.2	4.65	4.38	5.85	5.93	6.48	3.71	12.6	20.7	15.5	9.06	28.8	24 of 26
MERCURY	0.251	0.139	0.241	0.128	0.00577	0.252	0.122	0.138	0.0831	0.154	0.348	0.326	0.182	0.471	22 of 24
MOLYBDENUM	5.62	6.34	6.53	3.22	7.79	4.33	3.57	2.38	5.55	8.46	6.27	5.33	5.33	11.8	26 of 26
NICKEL	3.65	3.39	4.87	2.6	3.16	3.81	3.16	4.53	3.17	4.37	6.18	5.79	4.03	8.18	26 of 26
SELENIUM	0.433	0.323	0.295	0.298	0.519	0.544	0.541	0.824	0.402	0.351	0.43	0.757	0.473	0.874	0 of 26
SILVER	1.73	1.59	2.93	1.78	1.77	2.18	1.94	1.21	1.04	1.62	4.22	2.05	1.98	5.73	26 of 26
THALLIUM	0.481	0.358	0.328	0.331	0.577	0.604	0.601	0.916	0.447	0.39	0.477	0.841	0.526	0.971	0 of 26
ZINC	154	121	205	116	88.2	143	124	129	92.8	134	337	198	154.00	470.00	26 of 26

Cyanide (lbs/day)													Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
CYANIDE	4.76	3.58	3.28	3.31	5.76	5.81	5.85	8.24	4.42	4.05	5.67	11	5.43	14	0 of 26

Oil and Grease, Surfactants, and Petroleum Hydrocarbons (lbs/day)													Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
FATS OIL AND GREASE	34900	25500	42100	41200	63700	34300	32900	28200	30600	13800	41700	33600	35000	87700	25 of 25
MBAS	3560	4080	3660	3840	3600	3440	3920	3080	3930	3570	4000	2950	3630	4510	26 of 26
PETROLEUM HYDROCARBON	2090	840	1100	2410	1240	1010	1540	7770	998	3480	2130	4370	2450	14500	25 of 25

Organochlorine Pesticides and PCBs (lbs/day)													Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
4,4'-DDD	0.00212	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00229	0.00385	0.00235	0.00431	0 of 26
4,4'-DDE	0.00257	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00229	0.00385	0.00242	0.00431	1 of 26
4,4'-DDT	0.00212	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00229	0.00385	0.00235	0.00431	0 of 26
ALDRIN	0.00159	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00115	0.00192	0.00203	0.00431	0 of 26
ALPHA-BHC	0.00159	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00115	0.00192	0.00203	0.00431	0 of 26
ALPHA-CHLORDANE	0.00382	0.00157	0.00161	0.00739	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00115	0.00192	0.00282	0.0134	2 of 26
AROCLOR-1016	0.0798	0.0394	0.0403	0.0396	0.0624	0.063	0.0684	0.101	0.0479	0.0433	0.115	0.192	0.0747	0.196	0 of 26
AROCLOR-1221	0.16	0.0789	0.0807	0.0795	0.125	0.126	0.137	0.202	0.0956	0.0867	0.229	0.385	0.15	0.394	0 of 26
AROCLOR-1232	0.0798	0.0394	0.0403	0.0396	0.0624	0.063	0.0684	0.101	0.0479	0.0433	0.115	0.192	0.0747	0.196	0 of 26
AROCLOR-1242	0.0798	0.0394	0.0403	0.0396	0.0624	0.063	0.0684	0.101	0.0479	0.0433	0.115	0.192	0.0747	0.196	0 of 26
AROCLOR-1248	0.0798	0.0394	0.0403	0.0396	0.0624	0.063	0.0684	0.101	0.0479	0.0433	0.115	0.192	0.0747	0.196	0 of 26
AROCLOR-1254	0.0798	0.0394	0.0403	0.0396	0.0624	0.063	0.0684	0.101	0.0479	0.0433	0.115	0.192	0.0747	0.196	0 of 26
AROCLOR-1260	0.0798	0.0394	0.0403	0.0396	0.0624	0.063	0.0684	0.101	0.0479	0.0433	0.115	0.192	0.0747	0.196	0 of 26
BETA-BHC	0.00159	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00115	0.00192	0.00203	0.00431	0 of 26
CHLORDANE (TECHNICAL)	0.0531	0.0394	0.0403	0.0396	0.0624	0.063	0.0684	0.101	0.0479	0.0433	0.0573	0.0961	0.0588	0.108	0 of 26
DELTA-BHC	0.00159	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00115	0.00192	0.00203	0.00431	0 of 26
DIELDRIN	0.00212	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00229	0.00385	0.00235	0.00431	0 of 26
ENDOSULFAN I	0.00159	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00115	0.00192	0.00203	0.00431	0 of 26
ENDOSULFAN II	0.00212	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00229	0.00385	0.00235	0.00431	0 of 26
ENDOSULFAN SULFATE	0.00212	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00229	0.00385	0.00235	0.00431	0 of 26
ENDRIN	0.00212	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00229	0.00385	0.00235	0.00431	0 of 26
ENDRIN ALDEHYDE	0.00212	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00229	0.00385	0.00235	0.00431	0 of 26
ENDRIN KETONE	0.00212	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00229	0.00385	0.00235	0.00431	0 of 26
GAMMA-BHC (LINDANE)	0.00159	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00115	0.00192	0.00203	0.00431	0 of 26
GAMMA-CHLORDANE	0.00407	0.00157	0.00161	0.00924	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00115	0.00192	0.003	0.0171	2 of 26
HEPTACHLOR	0.00159	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00115	0.00192	0.00203	0.00431	0 of 26
HEPTACHLOR EPOXIDE	0.00159	0.00157	0.00161	0.00158	0.0025	0.00252	0.00274	0.00402	0.00191	0.00173	0.00115	0.00192	0.00203	0.00431	0 of 26
METHOXYCHLOR	0.0159	0.0157	0.0161	0.0158	0.025	0.0252	0.0274	0.0402	0.0191	0.0173	0.0115	0.0192	0.0203	0.0431	0 of 26
TOXAPHENE	0.0531	0.0394	0.0403	0.0396	0.0624	0.063	0.0684	0.101	0.0479	0.0433	0.0573	0.0961	0.0588	0.108	0 of 26

Table A-7. Deer Island Influent Loadings (South System), FY06 (cont.)

Semivolatile Organics (lbs/day)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
1,2,4-TRICHLOROBENZENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
1,2-DICHLOROBENZENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
1,2-DIPHENYLHYDRAZINE (AS AZOBENZENE)	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
1,3-DICHLOROBENZENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
1,4-DICHLOROBENZENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2,2'-OXYBIS(1-CHLOROPROPANE)	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2,4,5-TRICHLOROPHENOL	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2,4,6-TRICHLOROPHENOL	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2,4-DICHLOROPHENOL	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2,4-DIMETHYLPHENOL	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2,4-DINITROPHENOL	2.02	1.73	1.38	1.59	2.5	2.65	2.5	4.02	1.94	1.72	2.25	3.85	2.32	4.05	0 of 26
2,4-DINITROTOLUENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2,6-DINITROTOLUENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2-CHLORONAPHTHALENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2-CHLOROPHENOL	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2-METHYL-4,6-DINITROPHENOL	10.1	8.64	6.89	7.96	12.5	13.2	12.5	20.1	9.71	8.62	11.2	19.3	11.6	20.3	0 of 26
2-METHYLNAPHTHALENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2-METHYLPHENOL	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2-NITROANILINE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
2-NITROPHENOL	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
3,3'-DICHLOROBENZIDINE	2.02	1.73	1.38	1.59	2.5	2.65	2.5	4.02	1.94	1.72	2.25	3.85	2.32	4.05	0 of 26
3-NITROANILINE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
4-BROMOPHENYL PHENYL ETHER	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
4-CHLORO-3-METHYLPHENOL	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
4-CHLOROANILINE	1.01	0.864	0.689	2.73	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.31	4.57	1 of 26
4-CHLOROPHENYL PHENYL ETHER	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
4-METHYLPHENOL (INCLUDES 3-METHYLPHENOL)	10	12.9	26.6	32.2	3.9	1.32	10.5	2.01	17.2	30.5	35.7	1.93	15	40.1	18 of 26
4-NITROANILINE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
4-NITROPHENOL	2.02	1.73	1.38	1.59	2.5	2.65	2.5	4.02	1.94	1.72	2.25	3.85	2.32	4.05	0 of 26
ACENAPHTHENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
ACENAPHTHYLENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
ANILINE	1.01	0.864	0.689	6.99	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.64	7.29	2 of 26
ANTHRACENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
BENZIDINE	5.05	4.32	3.45	3.98	6.26	6.62	6.25	10	4.86	4.31	5.62	9.64	5.8	10.1	0 of 26
BENZO(A)ANTHRACENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
BENZO(A)PYRENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
BENZO(B)FLUORANTHENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
BENZO(GH)PERYLENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
BENZO(K)FLUORANTHENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
BENZOIC ACID	7.35	1.73	5.59	4.87	2.5	2.65	2.5	4.02	1.94	69.6	11.4	3.85	9.64	92	6 of 26
BENZYL ALCOHOL	1.01	3.93	10.3	5.63	4.86	4.74	1.25	2.01	11.1	10.4	13.6	1.93	7.08	23.2	16 of 26
BIS(2-CHLOROETHOXY)METHANE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
BIS(2-CHLOROETHYL)ETHER	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
BIS(2-ETHYLHEXYL)PHTHALATE	10.6	10.6	20.4	12.5	1.25	4.61	10	2.01	7.17	11.3	19.8	15.4	10.5	24	21 of 26
BUTYL BENZYL PHTHALATE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
CARBAZOLE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
CHRYSENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
DIBENZO(A,H)ANTHRACENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
DIBENZOFURAN	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
DIETHYL PHTHALATE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
DIMETHYL PHTHALATE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
DI-N-BUTYLPHTHALATE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
DI-N-OCTYLPHTHALATE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
FLUORANTHENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
FLUORENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
HEXACHLOROBENZENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
HEXACHLOROBUTADIENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
HEXACHLOROCYCLOPENTADIENE	5.05	4.32	3.45	3.98	6.26	6.62	6.25	10	4.86	4.31	5.62	9.64	5.8	10.1	0 of 26

Table A-7. Deer Island Influent Loadings (South System), FY06 (cont.)

Semivolatile Organics (lbs/day)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
HEXACHLOROETHANE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
INDENO(1,2,3-CD)PYRENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
ISOPHORONE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
NAPHTHALENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
N-DECANE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
NITROBENZENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
N-NITROSODIMETHYLAMINE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
N-NITROSODI-N-PROPYLAMINE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
N-NITROSODIPHENYLAMINE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
N-OCTADECANE	1.01	0.864	0.689	2.23	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.27	3.59	1 of 26
PENTACHLOROPHENOL	3.03	2.59	2.07	2.39	3.75	3.97	3.75	6.03	2.91	2.59	3.37	5.78	3.48	6.08	0 of 26
PHENANTHRENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
PHENOL	2.02	1.73	11.3	10.1	2.5	2.65	2.5	4.02	1.94	6.06	8.22	3.85	4.53	14.4	6 of 26
PYRENE	1.01	0.864	0.689	0.796	1.25	1.32	1.25	2.01	0.971	0.862	1.12	1.93	1.16	2.03	0 of 26
Volatile Organics (lbs/day)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
1,1,1-TRICHLOROETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
1,1,2,2-TETRACHLOROETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
1,1,2-TRICHLOROETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
1,1-DICHLOROETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
1,1-DICHLOROETHENE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
1,2-DICHLOROBENZENE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
1,2-DICHLOROETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
1,2-DICHLOROPROPANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
1,3-DICHLOROBENZENE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
1,4-DICHLOROBENZENE	1.98	2.88	2.08	1.04	0.576	0.581	0.585	0.824	0.442	0.405	1.7	1.1	1.24	3.57	8 of 26
2-BUTANONE	7.31	1.9	10.4	0.331	0.576	0.581	5.16	5.07	10.9	6.02	10.9	26.6	7.16	38.2	15 of 26
2-CHLOROETHYL VINYL ETHER	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
2-HEXANONE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
4-METHYL-2-PENTANONE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	1.86	1.1	0.642	3.12	1 of 26
ACETONE	75	49.3	67.3	48.5	117	69.8	98.2	115	68.1	37.5	107	207	87.3	267	24 of 26
ACROLEIN	0.953	0.715	0.655	0.663	1.15	1.16	1.17	1.65	0.884	0.81	1.13	2.21	1.09	2.8	0 of 26
ACRYLONITRILE	0.953	0.715	0.655	0.663	1.15	1.16	1.17	1.65	0.884	0.81	1.13	2.21	1.09	2.8	0 of 26
BENZENE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
BROMODICHLOROMETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
BROMOFORM	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
BROMOMETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
CARBON DISULFIDE	1.65	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.723	5.17	1 of 26
CARBON TETRACHLORIDE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
CHLOROBENZENE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
CHLOROETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
CHLOROFORM	5.07	1.29	2.14	2.67	0.576	0.581	0.585	0.824	0.442	1.34	1.8	1.1	1.81	8.2	11 of 26
CHLOROMETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
CIS-1,2-DICHLOROETHENE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
CIS-1,3-DICHLOROPROPENE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
DIBROMOCHLOROMETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
ETHYLBENZENE	3.08	0.358	1.15	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	1.01	10.9	2 of 26
M,P-XYLENE	6.28	0.715	3.97	0.663	1.15	1.16	1.17	1.65	0.884	0.81	1.13	2.21	2.16	22.3	2 of 26
METHYLENE CHLORIDE	2.88	1.18	1.28	1.81	1.49	1.01	1.61	0.824	0.97	0.784	0.72	1.69	1.47	4.64	17 of 26
O-XYLENE	2.89	0.358	1.3	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.988	10.1	2 of 26
STYRENE	1.84	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.753	3.49	2 of 26
TETRACHLOROETHENE	1.5	1.19	2.87	0.331	2.73	1.95	2.36	5.53	2.98	6.3	8.87	8.69	3.6	12.3	16 of 26
TOLUENE	11	4.58	3.92	5.03	2.03	2.37	0.585	0.824	2.83	2.33	7.98	1.1	4.28	34.6	16 of 26
TRANS-1,2-DICHLOROETHENE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
TRANS-1,3-DICHLOROPROPENE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
TRICHLOROETHENE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
TRICHLOROFLUOROMETHANE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
VINYL ACETATE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26
VINYL CHLORIDE	0.476	0.358	0.328	0.331	0.576	0.581	0.585	0.824	0.442	0.405	0.567	1.1	0.543	1.4	0 of 26

Notes

~: No data or no samples taken

Results in **bold** indicate one or more detects that month

Yearly averages are calculated from individual results collected during the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Table A-8. Deer Island Effluent Characterization, FY06

Metals (ug/L)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
ANTIMONY	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	0 of 25
ARSENIC	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0 of 27
BERYLLIUM	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0 of 25
BORON	125	256	201	298	125	125	125	125	125	125	169	125	150	313	6 of 25
CADMIUM	0.05	0.038	0.0781	0.0868	0.0469	0.015	0.0751	0.0838	0.074	0.0314	0.09	0.118	0.0675	0.341	64 of 95
CHROMIUM	1.06	0.937	1.32	1.14	0.778	0.82	1.01	1.38	1.62	1.3	1.37	1.18	1.15	2.88	85 of 96
COPPER	8.55	7.38	15.7	9.28	8.54	10.1	8.18	8.7	10	9.64	9.88	9.63	9.55	70.8	92 of 92
HEXAVALENT CHROMIUM	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0 of 26
IRON	171	168	327	211	182	166	140	260	212	278	318	254	224	409	25 of 25
LEAD	1.12	1.18	1.88	1.18	1.19	1.17	1.21	1.22	1.19	1.27	1.48	1.22	1.26	6.97	15 of 108
MERCURY	0.0129	0.0109	0.0171	0.0168	0.0135	0.00636	0.0103	0.00886	0.0094	0.0103	0.0125	0.0124	0.0115	0.0718	53 of 94
MOLYBDENUM	7.07	7.46	7.4	4.99	5.51	6.89	5.13	4.26	5.08	7.45	5.24	6.38	6.01	16.1	66 of 66
NICKEL	2.37	2.87	3.04	2.92	2.58	2.17	1.65	2.62	3.02	3.11	2.81	2.33	2.57	5.55	95 of 95
SELENIUM	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0 of 25
SILVER	0.17	0.13	0.346	0.233	0.232	0.244	0.188	0.185	0.248	0.235	0.212	0.166	0.21	1.3	88 of 95
THALLIUM	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 25
ZINC	23.6	28.7	25.6	26.7	21.7	22.2	29.1	31.8	27.3	22.2	31.5	28.8	26.7	84.6	95 of 95
Cyanide (ug/L)															
CYANIDE	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0 of 27
Oil and Grease, Surfactants, and Petroleum Hydrocarbons (mg/L)															
FATS OIL AND GREASE	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0 of 71
MBAS	171	292	319	193	257	146	190	169	160	240	221	363	231	468	43 of 43
PETROLEUM HYDROCARBON	81.4	50.8	98.8	41.6	209	166	20	179	19.3	114	47	20.1	81.4	706	17 of 68
Organochlorine Pesticides and PCBs (ug/L)															
4,4'-DDD	0.00244	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00234	0.00228	0.00224	0.00313	0 of 26
4,4'-DDE	0.00244	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00234	0.00228	0.00224	0.00313	0 of 26
4,4'-DDT	0.00244	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00234	0.00228	0.00224	0.00313	0 of 26
ALDRIN	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00117	0.00114	0.00191	0.00278	0 of 26
ALPHA-BHC	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00117	0.00114	0.00191	0.00278	0 of 26
ALPHA-CHLORDANE	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00117	0.00114	0.00191	0.00278	0 of 26
AROCLOR-1016	0.0951	0.0616	0.0534	0.0532	0.053	0.0558	0.0526	0.0518	0.0569	0.0532	0.116	0.114	0.0725	0.156	0 of 26
AROCLOR-1221	0.19	0.124	0.107	0.106	0.106	0.112	0.105	0.103	0.114	0.107	0.232	0.228	0.145	0.312	0 of 26
AROCLOR-1232	0.0951	0.0616	0.0534	0.0532	0.053	0.0558	0.0526	0.0518	0.0569	0.0532	0.116	0.114	0.0725	0.156	0 of 26
AROCLOR-1242	0.0951	0.0616	0.0534	0.0532	0.053	0.0558	0.0526	0.0518	0.0569	0.0532	0.116	0.114	0.0725	0.156	0 of 26
AROCLOR-1248	0.0951	0.0616	0.0534	0.0532	0.053	0.0558	0.0526	0.0518	0.0569	0.0532	0.116	0.114	0.0725	0.156	0 of 26
AROCLOR-1254	0.0951	0.0616	0.0534	0.0532	0.053	0.0558	0.0526	0.0518	0.0569	0.0532	0.116	0.114	0.0725	0.156	0 of 26
AROCLOR-1260	0.0951	0.0616	0.0534	0.0532	0.053	0.0558	0.0526	0.0518	0.0569	0.0532	0.116	0.114	0.0725	0.156	0 of 26
BETA-BHC	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00117	0.00114	0.00191	0.00278	0 of 26
CHLORDANE (TECHNICAL)	0.061	0.0616	0.0534	0.0532	0.053	0.0558	0.0526	0.0518	0.0543	0.0532	0.058	0.057	0.0557	0.0781	0 of 26
DELTA-BHC	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00117	0.00114	0.00191	0.00278	0 of 26
DIELDRIN	0.00244	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00234	0.00228	0.00224	0.00313	0 of 26
ENDOSULFAN I	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00117	0.00114	0.00191	0.00278	0 of 26
ENDOSULFAN II	0.00244	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00234	0.00228	0.00224	0.00313	0 of 26
ENDOSULFAN SULFATE	0.00244	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00234	0.00228	0.00224	0.00313	0 of 26
ENDRIN	0.00244	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00234	0.00228	0.00224	0.00313	0 of 26
ENDRIN ALDEHYDE	0.00244	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00234	0.00228	0.00224	0.00313	0 of 26
ENDRIN KETONE	0.00244	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00234	0.00228	0.00224	0.00313	0 of 26
GAMMA-BHC (LINDANE)	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00117	0.00114	0.00191	0.00278	0 of 26
GAMMA-CHLORDANE	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00117	0.00114	0.00191	0.00278	0 of 26
HEPTACHLOR	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00117	0.00114	0.00191	0.00278	0 of 26
HEPTACHLOR EPOXIDE	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00117	0.00114	0.00191	0.00278	0 of 26
HEXACHLOROBENZENE	0.00176	0.00247	0.00213	0.00213	0.00212	0.00223	0.0021	0.00207	0.00228	0.00213	0.00234	0.00114	0.00201	0.00278	0 of 26
METHOXYCHLOR	0.0176	0.0247	0.0213	0.0213	0.0212	0.0223	0.021	0.0207	0.0228	0.0213	0.0117	0.0114	0.0191	0.0278	0 of 26
TOXAPHENE	0.061	0.0616	0.0534	0.0532	0.053	0.0558	0.0526	0.0518	0.0569	0.0532	0.058	0.057	0.0559	0.0781	0 of 26

Table A-8. Deer Island Effluent Characterization, FY06 (cont.)

Semivolatle Organics (ug/L)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
1,2,4-TRICHLOROBENZENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
1,2-DICHLOROBENZENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
1,2-DIPHENYLHYDRAZINE (AS AZOBENZENE)	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
1,3-DICHLOROBENZENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
1,4-DICHLOROBENZENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2,2'-OXYBIS(1-CHLOROPROPANE)	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2,4,5-TRICHLOROPHENOL	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2,4,6-TRICHLOROPHENOL	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2,4-DICHLOROPHENOL	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2,4-DIMETHYLPHENOL	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2,4-DINITROPHENOL	2.23	2.78	2.12	2.1	2.26	2.13	2.09	2.15	2.21	2.14	2.31	2.33	2.23	3.28	0 of 25
2,4-DINITROTOLUENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2,6-DINITROTOLUENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2-CHLORONAPHTHALENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2-CHLOROPHENOL	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2-METHYL-4,6-DINITROPHENOL	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2-METHYLNAPHTHALENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2-METHYLPHENOL	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2-NITROANILINE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
2-NITROPHENOL	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
3,3'-DICHLOROBENZIDINE	2.23	2.78	2.12	2.1	2.26	2.13	2.09	2.15	2.21	2.14	2.31	2.33	2.23	3.28	0 of 25
3-NITROANILINE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
4-BROMOPHENYL PHENYL ETHER	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
4-CHLORO-3-METHYLPHENOL	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
4-CHLOROANILINE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
4-CHLOROPHENYL PHENYL ETHER	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
4-METHYLPHENOL (INCLUDES 3-METHYLPHENOL)	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
4-NITROANILINE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
4-NITROPHENOL	2.23	2.78	2.12	2.1	2.26	2.13	2.09	2.15	2.21	2.14	2.31	2.33	2.23	3.28	0 of 25
ACENAPHTHENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
ACENAPHTHYLENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
ANILINE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
ANTHRACENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
BENZIDINE	5.58	6.94	5.3	5.25	5.64	5.33	5.22	5.38	5.53	5.34	5.77	5.82	5.59	8.2	0 of 25
BENZO(A)ANTHRACENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
BENZO(A)PYRENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
BENZO(B)FLUORANTHENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
BENZO(GHI)PERYLENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
BENZO(K)FLUORANTHENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
BENZOIC ACID	2.23	2.78	2.12	2.1	2.26	2.13	2.09	2.15	2.21	2.14	2.31	2.33	2.23	3.28	0 of 25
BENZYL ALCOHOL	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
BIS(2-CHLOROETHOXY)METHANE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
BIS(2-CHLOROETHYL)ETHER	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
BIS(2-ETHYLHEXYL)PHTHALATE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	3.58	1.07	1.15	1.16	1.28	6.02	1 of 25
BUTYL BENZYL PHTHALATE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
CARBAZOLE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
CHRYSENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
DIBENZO(A,H)ANTHRACENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
DIBENZOFURAN	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
DIETHYL PHTHALATE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
DIMETHYL PHTHALATE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
DI-N-BUTYLPHTHALATE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
DI-N-OCTYLPHTHALATE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
FLUORANTHENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
FLUORENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
HEXACHLOROBENZENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
HEXACHLOROBUTADIENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
HEXACHLOROCYCLOPENTADIENE	5.58	6.94	5.3	5.25	5.64	5.33	5.22	5.38	5.53	5.34	5.77	5.82	5.59	8.2	0 of 25

Table A-8. Deer Island Effluent Characterization, FY06 (cont.)

Semivolatile Organics (ug/L)													Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
HEXACHLOROETHANE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
INDENO(1,2,3-CD)PYRENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
ISOPHORONE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
NAPHTHALENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
N-DECANE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
NITROBENZENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
N-NITROSODIMETHYLAMINE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
N-NITROSODI-N-PROPYLAMINE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
N-NITROSODIPHENYLAMINE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
N-OCTADECANE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
PENTACHLOROPHENOL	3.35	4.17	3.18	3.15	3.39	3.2	3.13	3.23	3.32	3.21	3.46	3.49	3.35	4.92	0 of 25
PHENANTHRENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25
PHENOL	2.23	2.78	2.12	2.1	2.26	2.13	2.09	2.15	2.21	2.14	2.31	2.33	2.23	3.28	0 of 25
PYRENE	1.12	1.39	1.06	1.05	1.13	1.07	1.04	1.08	1.11	1.07	1.15	1.16	1.12	1.64	0 of 25

Volatile Organics (ug/L)													Average	Maximum	Times Detected
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
1,1,1-TRICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
1,1,2,2-TETRACHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
1,1,2-TRICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
1,1-DICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
1,1-DICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
1,2-DICHLOROBENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
1,2-DICHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
1,2-DICHLOROPROPANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
1,3-DICHLOROBENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
1,4-DICHLOROBENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
2-BUTANONE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
2-CHLOROETHYL VINYL ETHER	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
2-HEXANONE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
4-METHYL-2-PENTANONE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
ACETONE	1	20.1	5.18	1	35.3	1	7.07	1	1	9.92	1	10.4	7.79	62.9	8 of 27
ACROLEIN	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0 of 27
ACRYLONITRILE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0 of 27
BENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
BROMODICHLOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
BROMOFORM	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
BROMOMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
CARBON DISULFIDE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
CARBON TETRACHLORIDE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
CHLOROBENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
CHLOROETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
CHLOROFORM	5.6	2.85	2.53	3.22	0.5	1.8	2.96	0.5	1.79	1.96	1.74	2.61	2.5	8.64	18 of 27
CHLOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
CIS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
CIS-1,3-DICHLOROPROPENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
DIBROMOCHLOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
ETHYLBENZENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
M,P-XYLENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0 of 27
METHYLENE CHLORIDE	1.97	0.643	1.38	1.18	2.05	1.3	1.81	0.96	1.01	1.37	0.5	1.01	1.27	3.3	18 of 27
O-XYLENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
STYRENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
TETRACHLOROETHENE	1.52	1.32	3.42	1.85	2.69	3.35	7.08	4.94	12.2	6.14	3.49	4.1	4.07	13.4	20 of 27
TOLUENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
TRANS-1,3-DICHLOROPROPENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
TRICHLOROETHENE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
TRICHLOROFLUOROMETHANE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
VINYL ACETATE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27
VINYL CHLORIDE	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0 of 27

Notes

--: No data or no samples taken

Results in **bold** indicate one or more detects that month

Yearly averages are calculated from individual results collected during the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Table A-9. Deer Island Effluent Loadings, FY06

Metals (lbs/day)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times
															Detected
ANTIMONY	34.7	27.9	26.1	24.1	38.1	39.9	38.9	58	31.5	33.1	43.5	55	37.4	60.9	0 of 25
ARSENIC	1.12	0.892	0.834	0.77	1.22	1.28	1.36	1.86	1.01	1.06	1.39	1.76	1.21	1.95	0 of 27
BERYLLIUM	0.695	0.557	0.521	0.481	0.761	0.797	0.778	1.16	0.63	0.663	0.87	1.1	0.749	1.22	0 of 25
BORON	347	571	420	575	381	399	389	580	315	331	589	550	450	609	6 of 25
CADMIUM	0.138	0.0909	0.183	0.275	0.148	0.0498	0.263	0.334	0.183	0.076	0.347	0.543	0.21	1.74	64 of 95
CHROMIUM	2.94	2.24	3.1	3.62	2.45	2.72	3.52	5.49	4	3.15	5.28	5.42	3.61	15.4	85 of 96
COPPER	23.1	17.6	36.7	29.4	26.9	33.5	28.7	34.7	24.4	23.3	38.1	44.2	30	162	92 of 92
HEXAVALENT CHROMIUM	7.64	5.55	5.26	4.98	8.39	7.79	8.04	10.7	6.3	6.8	10.3	17.4	8.21	23.4	0 of 26
IRON	475	375	681	406	555	531	436	1210	536	737	1110	1120	672	1650	25 of 25
LEAD	3.1	2.82	4.4	3.73	3.74	3.89	4.24	4.86	2.94	3.07	5.69	5.6	3.95	16	15 of 108
MERCURY	0.0348	0.026	0.0402	0.0531	0.0426	0.0211	0.0365	0.0353	0.0229	0.025	0.0483	0.0568	0.0362	0.181	53 of 94
MOLYBDENUM	19.2	18.2	16.3	18.1	17.1	23.3	18.2	15.8	12.4	17.9	23	25.5	18.9	37.5	66 of 66
NICKEL	6.54	6.87	7.13	9.25	8.13	7.2	5.77	10.4	7.46	7.52	10.8	10.7	8.05	19	95 of 95
SELENIUM	1.25	1	0.938	0.867	1.37	1.43	1.4	2.09	1.13	1.19	1.57	1.98	1.35	2.19	0 of 25
SILVER	0.47	0.31	0.812	0.737	0.731	0.809	0.658	0.737	0.613	0.568	0.819	0.761	0.66	2.98	88 of 95
THALLIUM	1.39	1.11	1.04	0.963	1.52	1.59	1.56	2.32	1.26	1.33	1.74	2.2	1.5	2.44	0 of 25
ZINC	65.2	68.7	60	84.5	68.3	73.8	102	127	67.3	53.7	121	132	83.7	291	95 of 95

Cyanide (lbs/day)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times
															Detected
CYANIDE	15.3	11.4	10.5	9.97	16.8	15.6	16.1	21.3	12.6	13.6	20.6	34.7	16.3	46.9	0 of 27

Oil and Grease, Surfactants, and Petroleum Hydrocarbons (mg/L)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times
															Detected
FATS OIL AND GREASE	1930	1770	1510	2390	2350	2360	2600	2490	1780	1760	3230	3820	2310	6560	0 of 71
MBAS	481	655	779	390	817	458	634	790	403	599	745	2090	714	3630	43 of 43
PETROLEUM HYDROCARBON	225	128	214	142	701	558	74.3	638	49.1	286	217	109	270	2920	17 of 68

Organochlorine Pesticides and PCBs (lbs/day)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times
															Detected
4,4'-DDD	0.00683	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00813	0.01	0.00669	0.0113	0 of 26
4,4'-DDE	0.00683	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00813	0.01	0.00669	0.0113	0 of 26
4,4'-DDT	0.00683	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00813	0.01	0.00669	0.0113	0 of 26
ALDRIN	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00408	0.005	0.0057	0.01	0 of 26
ALPHA-BHC	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00408	0.005	0.0057	0.01	0 of 26
ALPHA-CHLORDANE	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00408	0.005	0.0057	0.01	0 of 26
AROCLOR-1016	0.266	0.137	0.111	0.102	0.161	0.178	0.164	0.24	0.143	0.141	0.405	0.503	0.217	0.566	0 of 26
AROCLOR-1221	0.532	0.275	0.223	0.204	0.323	0.357	0.328	0.48	0.287	0.283	0.808	1	0.434	1.13	0 of 26
AROCLOR-1232	0.266	0.137	0.111	0.102	0.161	0.178	0.164	0.24	0.143	0.141	0.405	0.503	0.217	0.566	0 of 26
AROCLOR-1242	0.266	0.137	0.111	0.102	0.161	0.178	0.164	0.24	0.143	0.141	0.405	0.503	0.217	0.566	0 of 26
AROCLOR-1248	0.266	0.137	0.111	0.102	0.161	0.178	0.164	0.24	0.143	0.141	0.405	0.503	0.217	0.566	0 of 26
AROCLOR-1254	0.266	0.137	0.111	0.102	0.161	0.178	0.164	0.24	0.143	0.141	0.405	0.503	0.217	0.566	0 of 26
AROCLOR-1260	0.266	0.137	0.111	0.102	0.161	0.178	0.164	0.24	0.143	0.141	0.405	0.503	0.217	0.566	0 of 26
BETA-BHC	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00408	0.005	0.0057	0.01	0 of 26
CHLORDANE (TECHNICAL)	0.171	0.137	0.111	0.102	0.161	0.178	0.164	0.24	0.137	0.141	0.202	0.251	0.167	0.282	0 of 26
DELTA-BHC	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00408	0.005	0.0057	0.01	0 of 26
DIELDRIN	0.00683	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00813	0.01	0.00669	0.0113	0 of 26
ENDOSULFAN I	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00408	0.005	0.0057	0.01	0 of 26
ENDOSULFAN II	0.00683	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00813	0.01	0.00669	0.0113	0 of 26
ENDOSULFAN SULFATE	0.00683	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00813	0.01	0.00669	0.0113	0 of 26
ENDRIN	0.00683	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00813	0.01	0.00669	0.0113	0 of 26
ENDRIN ALDEHYDE	0.00683	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00813	0.01	0.00669	0.0113	0 of 26
ENDRIN KETONE	0.00683	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00813	0.01	0.00669	0.0113	0 of 26
GAMMA-BHC (LINDANE)	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00408	0.005	0.0057	0.01	0 of 26
GAMMA-CHLORDANE	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00408	0.005	0.0057	0.01	0 of 26
HEPTACHLOR	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00408	0.005	0.0057	0.01	0 of 26
HEPTACHLOR EPOXIDE	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00408	0.005	0.0057	0.01	0 of 26
HEXACHLOROBENZENE	0.00492	0.0055	0.00445	0.0041	0.00644	0.00712	0.00655	0.0096	0.00574	0.00565	0.00813	0.005	0.00601	0.0113	0 of 26
METHOXYCHLOR	0.0492	0.055	0.0445	0.041	0.0644	0.0712	0.0655	0.096	0.0574	0.0565	0.0408	0.05	0.057	0.1	0 of 26
TOXAPHENE	0.171	0.137	0.111	0.102	0.161	0.178	0.164	0.24	0.143	0.141	0.202	0.251	0.167	0.282	0 of 26

Table A-9. Deer Island Effluent Loadings, FY06 (cont.)

Semivolatile Organics (ug/L)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
1,2,4-TRICHLOROBENZENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
1,2-DICHLOROBENZENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
1,2-DIPHENYLHYDRAZINE (AS AZOBENZENE)	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
1,3-DICHLOROBENZENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
1,4-DICHLOROBENZENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2,2'-OXYBIS(1-CHLOROPROPANE)	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2,4,5-TRICHLOROPHENOL	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2,4,6-TRICHLOROPHENOL	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2,4-DICHLOROPHENOL	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2,4-DIMETHYLPHENOL	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2,4-DINITROPHENOL	6.21	6.19	4.42	4.04	6.87	6.79	6.5	9.99	5.58	5.67	8.04	10.2	6.69	11.6	0 of 25
2,4-DINITROTOLUENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2,6-DINITROTOLUENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2-CHLORONAPHTHALENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2-CHLOROPHENOL	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2-METHYL-4,6-DINITROPHENOL	3.1	3.1	2.21	2.02	3.44	3.4	3.25	50	27.9	28.3	40.2	51.2	33.5	57.9	0 of 25
2-METHYLNAPHTHALENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2-METHYLPHENOL	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2-NITROANILINE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
2-NITROPHENOL	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
3,3'-DICHLOROBENZIDINE	6.21	6.19	4.42	4.04	6.87	6.79	6.5	9.99	5.58	5.67	8.04	10.2	6.69	11.6	0 of 25
3-NITROANILINE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
4-BROMOPHENYL PHENYL ETHER	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
4-CHLORO-3-METHYLPHENOL	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
4-CHLOROANILINE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
4-CHLOROPHENYL PHENYL ETHER	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
4-METHYLPHENOL (INCLUDES 3-METHYLPHENOL)	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
4-NITROANILINE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
4-NITROPHENOL	6.21	6.19	4.42	4.04	6.87	6.79	6.5	9.99	5.58	5.67	8.04	10.2	6.69	11.6	0 of 25
ACENAPHTHENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
ACENAPHTHYLENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
ANILINE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
ANTHRACENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
BENZIDINE	15.5	15.5	11	10.1	17.2	17	16.3	25	13.9	14.2	20.1	25.6	16.7	29	0 of 25
BENZO(A)ANTHRACENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
BENZO(A)PYRENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
BENZO(B)FLUORANTHENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
BENZO(GHI)PERYLENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
BENZO(K)FLUORANTHENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
BENZOIC ACID	6.21	6.19	4.42	4.04	6.87	6.79	6.5	9.99	5.58	5.67	8.04	10.2	6.69	11.6	0 of 25
BENZYL ALCOHOL	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
BIS(2-CHLOROETHOXY)METHANE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
BIS(2-CHLOROETHYL)ETHER	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
BIS(2-ETHYLHEXYL)PHTHALATE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	9.02	2.83	4.02	5.12	3.84	15.1	1 of 25
BUTYL BENZYL PHTHALATE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
CARBAZOLE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
CHRYSENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
DIBENZO(A,H)ANTHRACENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
DIBENZOFURAN	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
DIETHYL PHTHALATE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
DIMETHYL PHTHALATE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
DI-N-BUTYLPHTHALATE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
DI-N-OCTYLPHTHALATE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
FLUORANTHENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
FLUORENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
HEXACHLOROBENZENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
HEXACHLOROBUTADIENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
HEXACHLOROCYCLOPENTADIENE	15.5	15.5	11	10.1	17.2	17	16.3	25	13.9	14.2	20.1	25.6	16.7	29	0 of 25

Table A-9. Deer Island Effluent Loadings, FY06 (cont.)

Semivolatile Organics (ug/L)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times
															Detected
HEXACHLOROETHANE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
INDENO(1,2,3-CD)PYRENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
ISOPHORONE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
NAPHTHALENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
N-DECANE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
NITROBENZENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
N-NITROSODIMETHYLAMINE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
N-NITROSODI-N-PROPYLAMINE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
N-NITROSODIPHENYLAMINE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
N-OCTADECANE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
PENTACHLOROPHENOL	9.31	9.29	6.63	6.07	10.3	10.2	9.76	15	8.37	8.5	12.1	15.4	10	17.4	0 of 25
PHENANTHRENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
PHENOL	6.21	6.19	4.42	4.04	6.87	6.79	6.5	9.99	5.58	5.67	8.04	10.2	6.69	11.6	0 of 25
PYRENE	3.1	3.1	2.21	2.02	3.44	3.4	3.25	5	2.79	2.83	4.02	5.12	3.35	5.79	0 of 25
Volatile Organics (lbs/day)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times
															Detected
1,1,1-TRICHLOROETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
1,1,2,2-TETRACHLOROETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
1,1,2-TRICHLOROETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
1,1-DICHLOROETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
1,1-DICHLOROETHENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
1,2-DICHLOROBENZENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
1,2-DICHLOROETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
1,2-DICHLOROPROPANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
1,3-DICHLOROBENZENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
1,4-DICHLOROBENZENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
2-BUTANONE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
2-CHLOROETHYL VINYL ETHER	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
2-HEXANONE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
4-METHYL-2-PENTANONE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
ACETONE	3.05	45.7	10.9	1.99	119	3.11	22.7	4.27	25.2	27	4.12	72	25.3	234	8 of 27
ACROLEIN	3.05	2.27	2.1	1.99	3.36	3.11	3.21	4.27	2.52	2.72	4.12	6.95	3.25	9.38	0 of 27
ACRYLONITRILE	3.05	2.27	2.1	1.99	3.36	3.11	3.21	4.27	2.52	2.72	4.12	6.95	3.25	9.38	0 of 27
BENZENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
BROMODICHLOROMETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
BROMOFORM	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
BROMOMETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
CARBON DISULFIDE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
CARBON TETRACHLORIDE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
CHLOROBENZENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
CHLOROETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
CHLOROFORM	17.1	6.47	5.32	6.42	1.68	5.61	9.53	2.13	4.51	5.32	7.17	18.1	8.13	33.9	18 of 27
CHLOROMETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
CIS-1,2-DICHLOROETHENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
CIS-1,3-DICHLOROPROPENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
DIBROMOCHLOROMETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
ETHYLBENZENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
M,P-XYLENE	3.05	2.27	2.1	1.99	3.36	3.11	3.21	4.27	2.52	2.72	4.12	6.95	3.25	9.38	0 of 27
METHYLENE CHLORIDE	6.01	1.46	2.89	2.36	6.9	4.04	5.83	4.1	2.55	3.72	2.06	6.99	4.12	12.3	18 of 27
O-XYLENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
STYRENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
TETRACHLOROETHENE	4.66	3.01	7.2	3.68	9.02	10.4	22.8	21.1	30.8	16.7	14.4	28.5	13.2	33.7	20 of 27
TOLUENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
TRANS-1,2-DICHLOROETHENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
TRANS-1,3-DICHLOROPROPENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
TRICHLOROETHENE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
TRICHLOROFLUOROMETHANE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
VINYL ACETATE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27
VINYL CHLORIDE	1.53	1.14	1.05	0.997	1.68	1.56	1.61	2.13	1.26	1.36	2.06	3.47	1.63	4.69	0 of 27

Notes

--: No data or no samples taken

Results in **bold** indicate one or more detects that month

Yearly averages are calculated from individual results collected during the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Table A-10. Deer Island Effluent Characterization (DEC), FY06

Organochlorine Pesticides and PCBs (ug/L)	Month											Times			
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Detected
2,4'-DDD	0.000137	0.000175	0.000108	0.000131	0.000122	0.000156	0.000107	0.000136	0.000129	0.000915	0.000382	0.000111	0.000212	0.00385	12 of 115
2,4'-DDE	0.000137	0.000175	0.000108	0.000131	0.000122	0.000117	0.000107	0.000136	0.000129	0.000105	0.000119	0.000111	0.000122	0.00026	0 of 115
2,4'-DDT	0.000137	0.000175	0.000108	0.000131	0.000122	0.000117	0.000107	0.000136	0.000129	0.000105	0.000119	0.000111	0.000122	0.00026	0 of 115
4,4'-DDD	0.000137	0.000175	0.000108	0.000415	0.000122	0.000117	0.000107	0.000136	0.000129	0.00182	0.000905	0.00016	0.00035	0.00817	20 of 115
4,4'-DDE	0.000192	0.000246	0.000422	0.000562	0.000242	0.000332	0.000276	0.000362	0.000274	0.000321	0.000377	0.000231	0.000317	0.00114	104 of 115
4,4'-DDT	0.000137	0.000175	0.000108	0.000488	0.000122	0.000292	0.000107	0.000136	0.000129	0.000363	0.000574	0.000111	0.000227	0.00187	11 of 115
ALDRIN	0.000137	0.000175	0.000108	0.000131	0.000122	0.000117	0.000107	0.000136	0.000129	0.000105	0.000119	0.000111	0.000122	0.00026	0 of 115
ALPHA-CHLORDANE	0.000559	0.000466	0.000914	0.002	0.000873	0.000778	0.000901	0.00116	0.000545	0.00106	0.00143	0.000979	0.001	0.00335	115 of 115
C13-4,4'-DDT (SURR)	0.0703	0.0449	0.0563	0.0599	0.0522	0.0611	0.0457	0.0484	0.0371	0.0655	0.0448	0.0622	0.0551	0.121	115 of 115
C13-GAMMA-BHC (SURR)	0.0646	0.0538	0.0594	0.056	0.0589	0.0567	0.0437	0.0585	0.0541	0.0585	0.0507	0.0724	0.058	0.0834	115 of 115
CIS-NONACHLOR	0.000138	0.000155	0.000132	0.000262	0.000125	0.000107	0.0000892	0.000128	0.0000536	0.000117	0.000154	0.000107	0.00013	0.000375	81 of 115
DDMU	0.000137	0.000175	0.000108	0.000131	0.000122	0.000117	0.000107	0.000136	0.000129	0.000105	0.000119	0.000111	0.000122	0.00026	0 of 115
DIELDRIN	0.000137	0.000175	0.000108	0.000131	0.000122	0.000117	0.000107	0.000136	0.000129	0.000105	0.000119	0.000111	0.000122	0.00026	0 of 115
ENDRIN	0.000137	0.000175	0.000108	0.000131	0.000122	0.000117	0.000107	0.000136	0.000129	0.000105	0.000119	0.000111	0.000122	0.00026	0 of 115
GAMMA-BHC (LINDANE)	0.00022	0.000348	0.000654	0.000645	0.000502	0.00054	0.000407	0.000311	0.000644	0.00122	0.00119	0.000905	0.000639	0.00357	80 of 115
GAMMA-CHLORDANE	0.000673	0.000471	0.000976	0.00194	0.000831	0.000774	0.000832	0.0011	0.000539	0.0011	0.00142	0.000925	0.000987	0.00324	115 of 115
HEPTACHLOR	0.000137	0.000175	0.000108	0.000131	0.000122	0.000117	0.000107	0.000136	0.000129	0.000105	0.000119	0.000111	0.000122	0.00026	0 of 115
HEPTACHLOR EPOXIDE	0.000137	0.000175	0.000108	0.000131	0.000122	0.000117	0.000107	0.000136	0.000129	0.000105	0.000119	0.000111	0.000122	0.00026	0 of 115
HEXACHLOROBENZENE	0.000129	0.000243	0.000139	0.000155	0.000139	0.0000959	0.0000597	0.0000742	0.0000757	0.0000718	0.0000786	0.0000721	0.000103	0.000445	111 of 115
MIREX	0.000137	0.000175	0.000108	0.000131	0.000122	0.000117	0.000107	0.000136	0.000129	0.000105	0.000119	0.000111	0.000122	0.00026	0 of 115
OXYCHLORDANE	0.000137	0.000175	0.000108	0.000131	0.000122	0.000117	0.000107	0.000136	0.000129	0.000105	0.000119	0.000111	0.000122	0.00026	0 of 115
TOTAL CHLORDANE	0.000841	0.000695	0.00126	0.00279	0.00126	0.00113	0.00115	0.00148	0.000696	0.00142	0.00196	0.00128	0.00136	0.00466	115 of 115
TOTAL DDT	0.000192	0.000246	0.000422	0.00136	0.000242	0.000619	0.000276	0.000362	0.000274	0.00313	0.00207	0.000299	0.000781	0.0134	106 of 115
TRANS-NONACHLOR	0.000282	0.000229	0.000345	0.00079	0.00039	0.000352	0.000246	0.000323	0.000151	0.000365	0.000532	0.000297	0.000362	0.00131	115 of 115

Table A-10. Deer Island Effluent Characterization (DEC), FY06 (cont.)

Polycyclic Aromatic Hydrocarbons (ug/L)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Times Detected		
													Average	Maximum	
1-METHYLNAPHTHALENE	0.00373	0.00367	0.00373	0.0233	0.00285	0.00308	0.00259	0.00279	0.00561	0.00493	0.00584	0.00428	0.00553	0.149	120 of 120
1-METHYLPHENANTHRENE	0.00116	0.00186	0.00182	0.0109	0.0014	0.00234	0.00166	0.00243	0.00228	0.00256	0.00199	0.0013	0.00269	0.06	90 of 120
2,3,5-TRIMETHYLNAPHTHALENE	0.00118	0.00224	0.00151	0.0143	0.00209	0.00329	0.00192	0.00344	0.00417	0.00853	0.00517	0.00178	0.00406	0.0842	90 of 120
2,6-DIMETHYLNAPHTHALENE	0.00176	0.00365	0.00214	0.027	0.0033	0.00446	0.000975	0.00135	0.00381	0.00947	0.00605	0.00209	0.00544	0.178	85 of 120
2-METHYLNAPHTHALENE	0.00277	0.00446	0.00352	0.0192	0.00331	0.00279	0.00315	0.00324	0.00577	0.016	0.00712	0.0035	0.006	0.11	116 of 120
ACENAPHTHENE	0.00163	0.00313	0.0043	0.00755	0.00152	0.00214	0.000856	0.00147	0.00544	0.00815	0.00413	0.00228	0.00328	0.0469	103 of 120
ACENAPHTHYLENE	0.000728	0.000672	0.00132	0.00117	0.000559	0.000705	0.000779	0.000539	0.00306	0.00179	0.000749	0.000826	0.000979	0.011	25 of 120
ANTHRACENE	0.000902	0.000905	0.00113	0.00523	0.00162	0.00198	0.00148	0.00195	0.00207	0.00494	0.00181	0.00189	0.00217	0.0337	76 of 120
BENZO(A)ANTHRACENE	0.00441	0.00417	0.00893	0.0159	0.00645	0.00752	0.0102	0.00942	0.004	0.00969	0.00813	0.0055	0.00802	0.102	120 of 120
BENZO(A)PYRENE	0.00341	0.00353	0.00941	0.014	0.00449	0.0072	0.0106	0.00923	0.00381	0.00858	0.00812	0.00485	0.00739	0.0946	118 of 120
BENZO(B)FLUORANTHENE	0.00615	0.00698	0.0185	0.0222	0.00631	0.0129	0.0164	0.0152	0.00598	0.0122	0.0135	0.00877	0.0123	0.147	120 of 120
BENZO(E)PYRENE	0.00342	0.00353	0.00963	0.0121	0.00338	0.00634	0.00942	0.00819	0.00349	0.00307	0.00689	0.00413	0.00627	0.0789	112 of 120
BENZO(G,H,I)PERYLENE	0.00316	0.00387	0.00966	0.00964	0.00318	0.00622	0.00745	0.00762	0.00324	0.0087	0.00657	0.00464	0.00621	0.0601	120 of 120
BENZO(K)FLUORANTHENE	0.0032	0.00284	0.00844	0.0083	0.00291	0.00528	0.0073	0.00748	0.00293	0.00817	0.00592	0.00369	0.0056	0.0512	120 of 120
BENZOTHAZOLE	0.0133	0.0219	0.0132	0.0209	0.0116	0.0164	0.00908	0.0105	0.0119	0.00971	0.00866	0.0229	0.0146	0.0524	119 of 120
BIPHENYL	0.000642	0.00101	0.000921	0.00595	0.000639	0.000814	0.000655	0.00103	0.00113	0.0013	0.00127	0.000859	0.00136	0.0411	46 of 120
C1-CHRYSENES	0.00138	0.00122	0.00546	0.0077	0.00156	0.00263	0.00331	0.00302	0.00121	0.0011	0.00265	0.00148	0.00278	0.0576	84 of 120
C1-DIBENZOTHIOPHENES	0.000567	0.000672	0.00056	0.0109	0.000559	0.00281	0.000542	0.000539	0.000597	0.000531	0.000593	0.0026	0.002	0.0985	8 of 120
C1-FLUORANTHENES/PYRENES	0.00855	0.00755	0.0161	0.0283	0.0132	0.0143	0.015	0.0149	0.00816	0.00833	0.0139	0.00952	0.0134	0.153	120 of 120
C1-FLUORENES	0.00354	0.00434	0.00543	0.0213	0.00606	0.00714	0.00484	0.00868	0.0156	0.0129	0.00779	0.00494	0.00829	0.105	108 of 120
C1-NAPHTHALENES	0.00536	0.00726	0.00648	0.0293	0.00419	0.00409	0.00395	0.00371	0.00759	0.0143	0.00898	0.00645	0.0083	0.172	120 of 120
C1-PHENANTHRENES/ANTHRACENES	0.00643	0.0102	0.0113	0.0524	0.00766	0.0107	0.00845	0.0107	0.0113	0.0146	0.0137	0.00735	0.0138	0.299	117 of 120
C2-CHRYSENES	0.000567	0.000672	0.00056	0.000556	0.000559	0.00116	0.000542	0.000539	0.000597	0.000531	0.000593	0.00056	0.000626	0.00435	1 of 120
C2-DIBENZOTHIOPHENES	0.000567	0.00272	0.00056	0.000556	0.000559	0.00053	0.000542	0.000539	0.000597	0.000531	0.000593	0.00168	0.000825	0.012	4 of 120
C2-FLUORANTHENES/PYRENES	0.000567	0.000672	0.00519	0.000556	0.000559	0.00053	0.000542	0.000539	0.000597	0.000531	0.000593	0.00056	0.000872	0.0273	1 of 120
C2-FLUORENES	0.0154	0.0136	0.0169	0.0419	0.0248	0.0322	0.0192	0.0292	0.0255	0.0323	0.0163	0.0189	0.0244	0.0729	106 of 120
C2-NAPHTHALENES	0.0117	0.00962	0.0078	0.0528	0.0038	0.00775	0.00431	0.00623	0.00852	0.0285	0.0198	0.00632	0.0136	0.342	118 of 120
C2-PHENANTHRENES/ANTHRACENES	0.0163	0.0182	0.0272	0.0546	0.0205	0.0297	0.0226	0.0247	0.0179	0.0232	0.0243	0.0135	0.0246	0.229	120 of 120
C3-CHRYSENES	0.000567	0.000672	0.00056	0.000556	0.000559	0.00053	0.000542	0.000539	0.000597	0.000531	0.000593	0.00056	0.000562	0.00109	0 of 120
C3-DIBENZOTHIOPHENES	0.000567	0.000672	0.00056	0.000556	0.000559	0.00053	0.000542	0.000539	0.000597	0.000531	0.000593	0.00056	0.000562	0.00109	0 of 120
C3-FLUORANTHENES/PYRENES	0.000567	0.000672	0.00056	0.000556	0.000559	0.00053	0.000542	0.000539	0.000597	0.000531	0.000593	0.00056	0.000562	0.00109	0 of 120
C3-FLUORENES	0.0139	0.00784	0.00955	0.0219	0.024	0.027	0.0191	0.0243	0.0159	0.0265	0.0174	0.0143	0.019	0.0499	100 of 120
C3-NAPHTHALENES	0.00651	0.00646	0.0191	0.0695	0.022	0.0255	0.0205	0.0337	0.0361	0.0745	0.0502	0.0454	0.0342	0.375	111 of 120
C3-PHENANTHRENES/ANTHRACENES	0.01	0.00951	0.0239	0.0399	0.0105	0.0204	0.0144	0.0137	0.00792	0.0115	0.0165	0.0112	0.0161	0.229	116 of 120
C4-CHRYSENES	0.000567	0.000672	0.00056	0.000556	0.000559	0.00053	0.000542	0.000539	0.000597	0.000531	0.000593	0.00056	0.000562	0.00109	0 of 120
C4-NAPHTHALENES	0.017	0.0204	0.0262	0.0531	0.0239	0.0283	0.0206	0.0348	0.0271	0.0465	0.0373	0.0323	0.0308	0.267	113 of 120
C4-PHENANTHRENES/ANTHRACENES	0.000567	0.000672	0.00719	0.000556	0.000559	0.00254	0.000542	0.000539	0.000597	0.000531	0.000593	0.00056	0.00121	0.0388	4 of 120
CHRYSENE	0.00697	0.00674	0.0143	0.0215	0.00814	0.0126	0.0172	0.016	0.00644	0.0109	0.0115	0.00774	0.012	0.132	120 of 120
DIBENZO(A,H)ANTHRACENE	0.000821	0.00086	0.00193	0.000894	0.000773	0.00192	0.00173	0.00305	0.000914	0.00781	0.00202	0.00199	0.00207	0.0232	65 of 120
DIBENZOFURAN	0.00209	0.00233	0.00515	0.00593	0.00316	0.00293	0.00207	0.00353	0.00494	0.00684	0.00324	0.00373	0.00374	0.0299	115 of 120
DIBENZOTHIOPHENE	0.000567	0.000881	0.00056	0.00515	0.000725	0.00105	0.000542	0.000799	0.00159	0.00216	0.00129	0.000931	0.00134	0.0329	34 of 120
FLUORANTHENE	0.0107	0.0114	0.0197	0.0406	0.0202	0.024	0.0314	0.0327	0.0168	0.0226	0.0242	0.0132	0.0228	0.22	120 of 120
FLUORENE	0.00219	0.00247	0.00326	0.0101	0.00243	0.00313	0.00239	0.00367	0.00546	0.00726	0.00427	0.00287	0.00403	0.0564	115 of 120
INDENO(1,2,3-CD)PYRENE	0.00279	0.00361	0.00898	0.00903	0.00273	0.00625	0.00669	0.00716	0.00256	0.00976	0.00728	0.00506	0.00604	0.0558	114 of 120
NAPHTHALENE	0.00883	0.00869	0.0111	0.0262	0.00753	0.00777	0.00783	0.00805	0.0163	0.0182	0.015	0.00908	0.0116	0.126	120 of 120
PERYLENE	0.000563	0.000866	0.00227	0.00254	0.001	0.00121	0.00187	0.00152	0.000597	0.000555	0.00151	0.000893	0.0013	0.0156	34 of 120
PHENANTHRENE	0.00486	0.0067	0.0079	0.0362	0.00496	0.0069	0.0066	0.00781	0.00818	0.0132	0.0103	0.00655	0.01	0.245	120 of 120
PYRENE	0.0209	0.0176	0.028	0.0489	0.0292	0.0268	0.0319	0.0332	0.016	0.0226	0.0319	0.0212	0.0279	0.246	120 of 120

Notes

DEC is the now-defunct Detailed Effluent Characterization project, which includes low-detection limit methods not approved by the EPA. DEC sampling is now carried out under the NP-EM project.

~: No data or no samples taken

Results in **bold** indicate one or more detects that month

Yearly averages are calculated from individual results collected during the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Table A-11. Deer Island Effluent Loadings (DEC), FY06

Organochlorine Pesticides and PCBs (lbs/day)	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
2,4'-DDD	0.000365	0.00039	0.000237	0.000426	0.000377	0.000526	0.000381	0.000503	0.000321	0.0022	0.00168	0.00044	0.000662	0.00903	12 of 115
2,4'-DDE	0.000365	0.00039	0.000237	0.000426	0.000377	0.000395	0.000381	0.000503	0.000321	0.000253	0.000521	0.00044	0.000381	0.000768	0 of 115
2,4'-DDT	0.000365	0.00039	0.000237	0.000426	0.000377	0.000395	0.000381	0.000503	0.000321	0.000253	0.000521	0.00044	0.000381	0.000768	0 of 115
4,4'-DDD	0.000365	0.00039	0.000237	0.00135	0.000377	0.000395	0.000381	0.000503	0.000321	0.00437	0.00398	0.000638	0.00109	0.0192	20 of 115
4,4'-DDE	0.000513	0.000546	0.000931	0.00183	0.00075	0.00112	0.00098	0.00134	0.000679	0.000771	0.00166	0.000924	0.000991	0.00554	104 of 115
4,4'-DDT	0.000365	0.00039	0.000237	0.00159	0.000377	0.00099	0.000381	0.000503	0.000321	0.000873	0.00252	0.00044	0.000708	0.00853	11 of 115
ALDRIN	0.000365	0.00039	0.000237	0.000426	0.000377	0.000395	0.000381	0.000503	0.000321	0.000253	0.000521	0.00044	0.000381	0.000768	0 of 115
ALPHA-CHLORDANE	0.00149	0.00103	0.00201	0.00651	0.00271	0.00263	0.0032	0.0043	0.00135	0.00254	0.00629	0.00391	0.00312	0.0215	115 of 115
C13-4,4'-DDT (SURR)	0.188	0.0997	0.124	0.195	0.162	0.207	0.162	0.179	0.092	0.158	0.197	0.248	0.172	0.377	115 of 115
C13-GAMMA-BHC (SURR)	0.173	0.12	0.131	0.183	0.183	0.192	0.155	0.217	0.134	0.141	0.223	0.289	0.181	0.365	115 of 115
CIS-NONACHLOR	0.00037	0.000345	0.000291	0.000855	0.000386	0.000363	0.000317	0.000473	0.000133	0.000281	0.000678	0.000429	0.000404	0.0024	81 of 115
DDMU	0.000365	0.00039	0.000237	0.000426	0.000377	0.000395	0.000381	0.000503	0.000321	0.000253	0.000521	0.00044	0.000381	0.000768	0 of 115
DIELDRIN	0.000365	0.00039	0.000237	0.000426	0.000377	0.000395	0.000381	0.000503	0.000321	0.000253	0.000521	0.00044	0.000381	0.000768	0 of 115
ENDRIN	0.000365	0.00039	0.000237	0.000426	0.000377	0.000395	0.000381	0.000503	0.000321	0.000253	0.000521	0.00044	0.000381	0.000768	0 of 115
GAMMA-BHC (LINDANE)	0.000589	0.000774	0.00144	0.0021	0.00156	0.00183	0.00145	0.00115	0.0016	0.00294	0.00522	0.00361	0.00199	0.0163	80 of 115
GAMMA-CHLORDANE	0.0018	0.00105	0.00215	0.00631	0.00258	0.00262	0.00295	0.00408	0.00134	0.00265	0.00622	0.00369	0.00308	0.0204	115 of 115
HEPTACHLOR	0.000365	0.00039	0.000237	0.000426	0.000377	0.000395	0.000381	0.000503	0.000321	0.000253	0.000521	0.00044	0.000381	0.000768	0 of 115
HEPTACHLOR EPOXIDE	0.000365	0.00039	0.000237	0.000426	0.000377	0.000395	0.000381	0.000503	0.000321	0.000253	0.000521	0.00044	0.000381	0.000768	0 of 115
HEXACHLOROBENZENE	0.000344	0.00054	0.000305	0.000506	0.000432	0.000324	0.000212	0.000275	0.000188	0.000173	0.000345	0.000288	0.000321	0.000954	111 of 115
MIREX	0.000365	0.00039	0.000237	0.000426	0.000377	0.000395	0.000381	0.000503	0.000321	0.000253	0.000521	0.00044	0.000381	0.000768	0 of 115
OXYCHLORDANE	0.000365	0.00039	0.000237	0.000426	0.000377	0.000395	0.000381	0.000503	0.000321	0.000253	0.000521	0.00044	0.000381	0.000768	0 of 115
TOTAL CHLORDANE	0.00224	0.00154	0.00277	0.00908	0.00392	0.00383	0.00407	0.0055	0.00173	0.00342	0.00863	0.0051	0.00425	0.0298	115 of 115
TOTAL DDT	0.000513	0.000546	0.000931	0.00442	0.00075	0.00209	0.00098	0.00134	0.000679	0.00754	0.00911	0.0012	0.00244	0.0315	106 of 115
TRANS-NONACHLOR	0.000752	0.00051	0.00076	0.00257	0.00121	0.00119	0.000872	0.0012	0.000374	0.000878	0.00234	0.00119	0.00113	0.00836	115 of 115

Table A-11. Deer Island Effluent Loadings (DEC), FY06 (cont.)

Polycyclic Aromatic Hydrocarbons (lbs/day)														Times	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Detected
1-METHYLNAPHTHALENE	0.0101	0.00897	0.00822	0.0841	0.00885	0.0104	0.0092	0.0103	0.0137	0.0119	0.031	0.0171	0.0173	0.286	120 of 120
1-METHYLPHENANTHRENE	0.00317	0.00455	0.004	0.0394	0.00433	0.00791	0.0059	0.00899	0.00556	0.00615	0.0106	0.00519	0.00841	0.115	90 of 120
2,3,5-TRIMETHYLNAPHTHALENE	0.00321	0.00548	0.00332	0.0517	0.00647	0.0111	0.00681	0.0127	0.0102	0.0205	0.0274	0.00712	0.0127	0.161	90 of 120
2,6-DIMETHYLNAPHTHALENE	0.0048	0.00893	0.00471	0.0977	0.0102	0.0151	0.00346	0.005	0.00931	0.0228	0.0321	0.00835	0.017	0.341	85 of 120
2-METHYLNAPHTHALENE	0.00754	0.0109	0.00775	0.0694	0.0103	0.00943	0.0112	0.012	0.0141	0.0384	0.0378	0.014	0.0188	0.211	116 of 120
ACENAPHTHENE	0.00444	0.00765	0.00948	0.0273	0.00473	0.00723	0.00304	0.00546	0.0133	0.0196	0.0219	0.00911	0.0103	0.0899	103 of 120
ACENAPHTHYLENE	0.00198	0.00164	0.00291	0.00424	0.00173	0.00239	0.00277	0.002	0.00748	0.00431	0.00397	0.0033	0.00306	0.0255	25 of 120
ANTHRACENE	0.00246	0.00221	0.00249	0.0189	0.00502	0.0067	0.00526	0.00722	0.00505	0.0119	0.00959	0.00753	0.0068	0.0645	76 of 120
BENZO(A)ANTHRACENE	0.012	0.0102	0.0197	0.0575	0.02	0.0255	0.0362	0.0349	0.00976	0.0233	0.0431	0.022	0.0251	0.195	120 of 120
BENZO(A)PYRENE	0.00927	0.00863	0.0207	0.0505	0.0139	0.0244	0.0376	0.0342	0.0093	0.0206	0.0431	0.0194	0.0231	0.181	118 of 120
BENZO(B)FLUORANTHENE	0.0167	0.0171	0.0408	0.0802	0.0196	0.0438	0.0583	0.0564	0.0146	0.0293	0.0718	0.035	0.0385	0.281	120 of 120
BENZO(E)PYRENE	0.0093	0.00863	0.0212	0.0437	0.0105	0.0215	0.0334	0.0304	0.00853	0.00739	0.0365	0.0165	0.0196	0.151	112 of 120
BENZO(G,H,I)PERYLENE	0.0086	0.00947	0.0213	0.0348	0.00986	0.0211	0.0265	0.0282	0.00791	0.0209	0.0348	0.0185	0.0194	0.115	120 of 120
BENZO(K)FLUORANTHENE	0.00871	0.00695	0.0186	0.03	0.00902	0.0179	0.0259	0.0277	0.00714	0.0197	0.0314	0.0147	0.0175	0.098	120 of 120
BENZOTHIAZOLE	0.0362	0.0534	0.0291	0.0757	0.0358	0.0554	0.0322	0.0391	0.029	0.0234	0.0459	0.0914	0.0457	0.237	119 of 120
BIPHENYL	0.00175	0.00248	0.00203	0.0215	0.00198	0.00275	0.00233	0.0038	0.00275	0.00312	0.00674	0.00343	0.00427	0.0786	46 of 120
C1-CHRYSENES	0.00377	0.00297	0.012	0.0278	0.00483	0.0089	0.0118	0.0112	0.00295	0.00264	0.0141	0.0059	0.00869	0.11	84 of 120
C1-DIBENZOTHIOPHENES	0.00154	0.00164	0.00123	0.0395	0.00173	0.0095	0.00192	0.002	0.00146	0.00128	0.00314	0.0104	0.00624	0.189	8 of 120
C1-FLUORANTHENES/PYRENES	0.0233	0.0185	0.0355	0.102	0.041	0.0483	0.0531	0.0551	0.0199	0.02	0.0737	0.038	0.042	0.293	120 of 120
C1-FLUORENES	0.00962	0.0106	0.012	0.0769	0.0188	0.0242	0.0172	0.0322	0.0381	0.031	0.0413	0.0197	0.0259	0.201	108 of 120
C1-NAPHTHALENES	0.0146	0.0178	0.0143	0.106	0.013	0.0138	0.014	0.0138	0.0185	0.0345	0.0476	0.0257	0.026	0.329	120 of 120
C1-PHENANTHRENE/ANTHRACENES	0.0175	0.0249	0.0249	0.19	0.0238	0.0363	0.03	0.0396	0.0276	0.0352	0.0729	0.0294	0.043	0.573	117 of 120
C2-CHRYSENES	0.00154	0.00164	0.00123	0.00201	0.00173	0.00391	0.00192	0.002	0.00146	0.00128	0.00314	0.00223	0.00196	0.0145	1 of 120
C2-DIBENZOTHIOPHENES	0.00154	0.00665	0.00123	0.00201	0.00173	0.00179	0.00192	0.002	0.00146	0.00128	0.00314	0.00671	0.00258	0.0291	4 of 120
C2-FLUORANTHENES/PYRENES	0.00154	0.00164	0.0114	0.00201	0.00173	0.00179	0.00192	0.002	0.00146	0.00128	0.00314	0.00223	0.00273	0.0625	1 of 120
C2-FLUORENES	0.0419	0.0332	0.0372	0.152	0.0769	0.109	0.0681	0.108	0.0622	0.0776	0.0864	0.0754	0.0763	0.467	106 of 120
C2-NAPHTHALENES	0.0319	0.0235	0.0172	0.191	0.0118	0.0262	0.0153	0.0231	0.0208	0.0686	0.105	0.0252	0.0426	0.655	118 of 120
C2-PHENANTHRENE/ANTHRACENES	0.0443	0.0444	0.06	0.197	0.0635	0.101	0.0803	0.0916	0.0436	0.0558	0.129	0.054	0.0768	0.439	120 of 120
C3-CHRYSENES	0.00154	0.00164	0.00123	0.00201	0.00173	0.00179	0.00192	0.002	0.00146	0.00128	0.00314	0.00223	0.00176	0.00362	0 of 120
C3-DIBENZOTHIOPHENES	0.00154	0.00164	0.00123	0.00201	0.00173	0.00179	0.00192	0.002	0.00146	0.00128	0.00314	0.00223	0.00176	0.00362	0 of 120
C3-FLUORANTHENES/PYRENES	0.00154	0.00164	0.00123	0.00201	0.00173	0.00179	0.00192	0.002	0.00146	0.00128	0.00314	0.00223	0.00176	0.00362	0 of 120
C3-FLUORENES	0.0378	0.0192	0.0211	0.0791	0.0745	0.0915	0.0679	0.0899	0.0389	0.0638	0.0921	0.0572	0.0595	0.229	100 of 120
C3-NAPHTHALENES	0.0177	0.0158	0.0422	0.251	0.0684	0.0864	0.0727	0.125	0.0883	0.179	0.267	0.181	0.107	0.717	111 of 120
C3-PHENANTHRENE/ANTHRACENES	0.0273	0.0232	0.0526	0.144	0.0326	0.0689	0.0511	0.0509	0.0193	0.0277	0.0876	0.0446	0.0503	0.438	116 of 120
C4-CHRYSENES	0.00154	0.00164	0.00123	0.00201	0.00173	0.00179	0.00192	0.002	0.00146	0.00128	0.00314	0.00223	0.00176	0.00362	0 of 120
C4-NAPHTHALENES	0.0462	0.0498	0.0577	0.192	0.0742	0.0959	0.0731	0.129	0.0662	0.112	0.198	0.129	0.0963	0.512	113 of 120
C4-PHENANTHRENE/ANTHRACENES	0.00154	0.00164	0.0159	0.00201	0.00173	0.00858	0.00192	0.002	0.00146	0.00128	0.00314	0.00223	0.0038	0.0889	4 of 120
CHRYSENE	0.019	0.0165	0.0316	0.0777	0.0253	0.0426	0.0612	0.0591	0.0157	0.0262	0.0607	0.0309	0.0375	0.253	120 of 120
DIBENZO(A,H)ANTHRACENE	0.00224	0.0021	0.00424	0.00323	0.0024	0.00649	0.00614	0.0113	0.00223	0.0188	0.0107	0.00793	0.00648	0.0544	65 of 120
DIBENZOFURAN	0.0057	0.0057	0.0114	0.0214	0.0098	0.00993	0.00735	0.0131	0.0121	0.0165	0.0172	0.0149	0.0117	0.0573	115 of 120
DIBENZOTHIOPHENE	0.00154	0.00215	0.00123	0.0186	0.00225	0.00354	0.00192	0.00296	0.00387	0.00519	0.00682	0.00372	0.0042	0.0629	34 of 120
FLUORANTHENE	0.0292	0.028	0.0435	0.147	0.0628	0.0811	0.111	0.121	0.041	0.0544	0.128	0.0525	0.0712	0.421	120 of 120
FLUORENE	0.00597	0.00603	0.00718	0.0365	0.00754	0.0106	0.00847	0.0136	0.0133	0.0175	0.0227	0.0115	0.0126	0.108	115 of 120
INDENO(1,2,3-CD)PYRENE	0.00758	0.00882	0.0198	0.0327	0.00848	0.0211	0.0237	0.0266	0.00625	0.0235	0.0386	0.0202	0.0189	0.107	114 of 120
NAPHTHALENE	0.024	0.0213	0.0244	0.0947	0.0234	0.0263	0.0278	0.0298	0.0399	0.0439	0.0798	0.0362	0.0363	0.242	120 of 120
PERYLENE	0.00153	0.00212	0.00501	0.00917	0.00311	0.0041	0.00663	0.00563	0.00146	0.00133	0.00802	0.00356	0.00406	0.0299	34 of 120
PHENANTHRENE	0.0132	0.0164	0.0174	0.131	0.0154	0.0234	0.0234	0.029	0.02	0.0319	0.0548	0.0262	0.0314	0.469	120 of 120
PYRENE	0.057	0.043	0.0618	0.177	0.0906	0.0906	0.113	0.123	0.0392	0.0544	0.169	0.0845	0.0873	0.471	120 of 120

Notes

DEC is the now-defunct Detailed Effluent Loadings project, which includes low-detection limit methods not approved by the EPA. DEC sampling is now carried out under the NP-EM project.

~: No data or no samples taken

Results in **bold** indicate one or more detects that month

Yearly averages are calculated from individual results collected during the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Appendix B

Table B-1	Cottage Farm CSO Facility Operations Summary, Fiscal Year 2006
Table B-2	Cottage Farm CSO Facility Effluent Characterization, Fiscal Year 2006
Table B-3	Cottage Farm CSO Facility Effluent Loadings, Fiscal Year 2006

Table B-1. Cottage Farm CSO Facility Operations Summary, FY06

Date	Rainfall	Discharge duration (hrs)	Total volume (MG)	Peak flow (MG)	pH (SU)	BOD (mg/L)	Effluent		Chlorine residual (mg/L)
							TSS (mg/L)	Fecal coliform (col/100mL)	
July									
6	2.04	7.80	24.97	137.60	6.5	54.0	150.0	560	0.03
							148.0	400	0.03
							111.0	410	0.03
							100.0	30	0.03
							76.0	10	0.03
							62.7	10	0.03
							55.0	10	0.03
							108.0	150	0.03
							124.0	290	0.03
							114.0	120	0.03
							108.0	430	0.03
							90.0	330	0.03
							90.0	750	0.03
							93.0	700	0.03
							96.0	900	0.03
							97.0	680	0.03
							77.0	480	0.03
							84.0	2100	0.03
							91.0	2700	0.03
							110.0	2000	0.03
							125.0	3700	0.03
							97.0	1600	0.03
							66.0	10	0.03
August									
2	0.01	2.17	3.80	80.00					
September									
15	0.98	3.45	4.20	200.00					
October									
8	1.02	1.75	0.71	86.60					
9	0.92	5.92	11.00	133.00					
15	2.89	18.67	84.91	166.40					
25	1.26	3.75	3.20	283.00	6.9	54.4	72.7	2200	3.48
							43.3	10	4.92
							32.7	10	0.03
November									
NA									
December									
NA									
January									
NA									
February									
NA									
March									
NA									
April									
NA									

Table B-1. Cottage Farm CSO Facility Operations Summary, FY06

Date	Rainfall	Discharge duration (hrs)	Total volume (MG)	Peak flow (MG)	pH (SU)	BOD (mg/L)	TSS (mg/L)	Effluent	Chlorine residual (mg/L)				
								Fecal coliform (col/100mL)					
May													
13	3.84	10.58	29.32	150.00	6.8		80.0	440	0.03				
					6.4		158.0	6000	0.03				
					6.6		110.0	1400	1.29				
					6.6		82.0		0.03				
					6.6		74.0	620	0.03				
					6.8		58.0	50	0.03				
					6.5		52.0	50	0.03				
					6.5		76.0	150	0.03				
					6.6		59.0	520	0.03				
					6.6		41.0	30	0.03				
					6.6		56.5	150	0.03				
					14	3.77	22.17	61.50	6.6	51.8	54.0	60	0.03
									6.6		42.0	470	0.03
									6.7		38.0	200	0.03
6.5		19.5	210	0.03									
6.0		34.0	10	0.03									
6.5		23.0	220	0.03									
6.4		17.0	110	0.03									
6.3		39.0	240	0.03									
6.4		58.5	160	0.03									
6.3		42.5	670	0.03									
6.5		50.0	1400	0.03									
		46.0	750	0.03									
		48.0	4200	0.03									
		74.0	2300	0.03									
		49.0	410	0.03									
		46.5	110	0.03									
		38.5	3500	0.03									
		43.0	570	0.03									
		51.5	7600	0.03									
		45.5	6500	0.03									
		40.5	1500	0.03									
		35.0	510	0.03									
15	0.36	18.78	52.21			31.5	470	0.03					
						31.5	40	0.03					
						22.5	240	0.03					
						19.5	110	0.03					
						16.5	480	0.03					
						12.0	280	0.03					
						9.5	10	0.03					
						11.5	120	0.03					
						13.5	150	0.99					
						22.0	10	0.03					
						26.5	80	0.03					
						30.0	30	0.03					
						28.5	210	0.03					
						34.0	200	0.03					
		31.0	40	0.03									
		26.0	100	0.03									
		27.0	100	0.03									
		21.5	70	0.03									
June													
7	2.89	10.25	51.81	178.00	6.8		67.5	2400	0.03				
					6.7		63.0	9100	0.03				
					6.8		66.0	2600	0.03				
							83.0	5600	0.03				
							61.0	6000	0.03				
							54.0	5600	0.03				
							72.0	3400	0.03				
							59.0	2800	0.03				
							48.0	4100	0.03				
							43.0	1000	0.03				
8	0.20	3.42				50.4	36.0	400	0.03				
							26.0	930	0.03				
							22.0	20	0.03				
23	1.36	3.42	7.00										
Total		112.13	334.63										
Average		8.63	27.89	157.18		52.7	61.33	296	0.74				
Minimum		1.75	0.71	80.00	6.00	43.1	43.06	60	0.03				
Maximum*		22.17	84.91	283.00	6.90	54.4	98.81	1856	4.92				

Number of CSO events 10

NA = No Activation.

* = Per the NPDES permit, maximum chlorine residual is the highest single sample.

Table B-1. Cottage Farm CSO Facility Operations Summary, FY06

Date	Rainfall	Discharge duration (hrs)	Total volume (MG)	Peak flow (MG)	pH (SU)	BOD (mg/L)	TSS (mg/L)	Effluent	
								Fecal coliform (col/100mL)	Chlorine residual (mg/L)
Boxed dates indicate a single event spread out over multiple days.									

Table B-2. Cottage Farm CSO Facility Effluent Characterization, FY06

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
Metals (ug/L)															
ALUMINUM	~	~	~	553.00	NA	NA	NA	NA	NA	NA	950.00	~	751.50	950.00	3 of 3
CADMIUM	~	~	~	0.32	NA	NA	NA	NA	NA	NA	0.35	~	0.33	0.35	2 of 5
CALCIUM	~	~	~	18400.00	NA	NA	NA	NA	NA	NA	17300.00	~	17850.00	18400.00	3 of 3
CHROMIUM	~	~	~	3.69	NA	NA	NA	NA	NA	NA	4.88	~	4.28	4.88	2 of 4
COPPER	~	~	~	31.40	NA	NA	NA	NA	NA	NA	38.60	~	35.00	38.60	3 of 3
LEAD	~	~	~	18.20	NA	NA	NA	NA	NA	NA	20.30	~	19.25	20.30	2 of 3
MAGNESIUM	~	~	~	3620.00	NA	NA	NA	NA	NA	NA	3560.00	~	3590.00	3620.00	3 of 3
MERCURY	~	~	~	0.13	NA	NA	NA	NA	NA	NA	0.26	~	0.19	0.26	2 of 2
NICKEL	~	~	~	2.56	NA	NA	NA	NA	NA	NA	3.89	~	3.23	3.89	2 of 5
ZINC	~	~	~	68.75	NA	NA	NA	NA	NA	NA	105.00	~	86.88	105.00	3 of 3
Surfactants and Total Organic Carbon (mg/L)															
SURFACTANTS	~	~	~	1.55	NA	NA	NA	NA	NA	NA	1.62	~	1.59	1.62	2 of 2
TOTAL ORGANIC CARBON	~	~	~	30.90	NA	NA	NA	NA	NA	NA	24.30	~	27.60	30.90	2 of 2

Table B-3. Cottage Farm CSO Facility Effluent Loadings, FY06

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
Metals (lbs/day)															
ALUMINUM	~	~	~	14.76	NA	NA	NA	NA	NA	NA	232.30	~	123.53	232.30	3 of 3
CADMIUM	~	~	~	0.01	NA	NA	NA	NA	NA	NA	0.09	~	0.05	0.09	2 of 5
CALCIUM	~	~	~	491.06	NA	NA	NA	NA	NA	NA	4230.35	~	2360.70	4230.35	3 of 3
CHROMIUM	~	~	~	0.10	NA	NA	NA	NA	NA	NA	1.19	~	0.65	1.19	2 of 4
COPPER	~	~	~	0.84	NA	NA	NA	NA	NA	NA	9.44	~	5.14	9.44	3 of 3
LEAD	~	~	~	0.49	NA	NA	NA	NA	NA	NA	4.96	~	2.72	4.96	2 of 3
MAGNESIUM	~	~	~	96.61	NA	NA	NA	NA	NA	NA	870.52	~	483.57	870.52	3 of 3
MERCURY	~	~	~	0.003	NA	NA	NA	NA	NA	NA	0.06	~	0.03	0.06	2 of 2
NICKEL	~	~	~	0.07	NA	NA	NA	NA	NA	NA	0.95	~	0.51	0.95	2 of 5
ZINC	~	~	~	1.83	NA	NA	NA	NA	NA	NA	25.68	~	13.76	25.68	3 of 3
Surfactants and Total Organic Carbon (lbs/day)															
SURFACTANTS	~	~	~	41.37	NA	NA	NA	NA	NA	NA	396.14	~	218.75	396.14	2 of 2
TOTAL ORGANIC CARBON	~	~	~	824.66	NA	NA	NA	NA	NA	NA	5942.05	~	3383.35	5942.05	2 of 2

NA: No activation

~: Activation that month, but no data or no sample taken

Results in **bold** indicate one or more detects in the month.

Yearly averages are calculated from individual results collected in the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Appendix C

Table C-1	Prison Point CSO Facility Operations Summary, Fiscal Year 2006
Table C-2	Prison Point CSO Facility Effluent Characterization, Fiscal Year 2006
Table C-3	Prison Point CSO Facility Effluent Loadings, Fiscal Year 2006

Table C-1. Prison Point CSO Facility Operations Summary, FY06

Date	Rainfall	Discharge duration (hrs)	Total volume (MG)	Peak flow (MG)	pH (SU)	BOD (mg/L)	TSS (mg/L)	Effluent Fecal coliform (col/100mL)	Chlorine residual (mg/L)
July									
6	2.04	11	51.38	312.0					
8	0.95	5.558	12.06	150.0					
August									
2	0.01	3.22	10.79	219.0					
5	0.55	2.08	5.08	111.0					
14	0.60	3.17	4.94	54.0					
29	0.33	3.67	5.33	25.0					
September									
15	0.98	5.33	14.20	281.0					
October									
8	1.02	2.67	7.27	126.0					
9	0.92	6.42	30.42	280.1					
15	2.89	26.53	126.05	297.0					
23	0.46	4.50	7.77	145.0					
25	1.26	15.17	27.42	61.9					
November									
22	1.61	12.12	18.58	170.0	6.8	16.8	107.0	380	0.00
							134.0	580	0.00
							274.0	340	0.00
							79.0	10	0.00
							36.0	10	0.06
							76.0	40	0.03
							34.0	50	0.03
							49.0	110	0.03
							34.0	10	0.03
							32.0	10	0.04
							39.0	10	0.03
							43.0	10	0.03
30	0.64	1.87	3.19	122.0					
December									
16	0.84	3.63	6.20	107.2					
26	0.77	2.08	2.65	74.0					
January									
14	0.90	4.42	8.48	64.0					
15	0.39	1.95	3.68	35.0					
18	0.69	3.20	8.56	190.0					
February									
3	0.61	2.75	2.36	88.2					
4	0.45	2.47	4.41	82.0					
5	0.34	1.67	2.85	138.0					
March									
NA									
April									
23	0.61	0.67	1.08	10.0	6.2		350.0	200	0.03
24	0.13	0.92	1.49			54.3	102.0	10	2.96

Table C-1. Prison Point CSO Facility Operations Summary, FY06

Date	Rainfall	Discharge duration (hrs)	Total volume (MG)	Peak flow (MG)	pH (SU)	BOD (mg/L)	Effluent		Chlorine residual (mg/L)
							TSS (mg/L)	Fecal coliform (col/100mL)	
May									
2	0.91	1.42	1.52	60.0					
9	0.96	5.25	9.29		6.6		118.0	10	0.03
							102.0	40	0.03
							102.0	20	0.03
							76.0	10	0.03
							60.0	10	0.03
10	0.55	0.92	1.82			36.5	67.0	110	0.03
13	3.84	17.42	68.91	225.0	6.3		82.0	1500	0.23
							47.0	30	0.03
							46.0	70	0.03
							51.0	290	0.03
							60.0	110	0.03
							86.0	230	0.03
							61.0	90	0.03
							65.0	80	0.03
							113.0	240	0.92
							80.0	190	0.03
							71.0	900	0.03
							76.0		0.03
							76.0	60	0.03
							66.0	10	1.87
							43.5	240	1.15
							41.5	10	1.59
							47.0	50	0.50
							63.0	170	0.03
14	3.77	24.00	115.47	315.0		10.6	77.0	150	1.04
							50.0	10	2.56
							47.0	10	2.22
							16.5	10	2.80
							24.0	10	3.10
							20.5	10	2.10
							27.5	21000	2.50
							73.0	28000	1.10
							47.0	16000	6.03
							78.0	10	2.70
							95.0	2200	0.15
							32.5	210	0.03
							38.5	300	0.03
							284.0	70	2.70
							42.5	10	6.50
							43.0	500	1.70
							54.0	610	2.00
							27.5	250	1.80
							18.0	20	3.90
							16.0	150	2.40
							13.5	10	6.80
							14.0	800	0.00
							14.5	350	0.03
							12.0	170	0.03
							14.5	60	0.03
15	0.36	11.00	10.37	65.0			14.0	300	0.04
							11.0	1200	0.03
							10.0	7200	0.03
							8.5	190	0.98
							8.5	3400	0.03
							23.0	810	1.80
							18.5	980	1.08
							15.0	23000	0.03
16	0.52	1.33	2.52	20.0					
June									
3	1.91	7.92	6.78	124.0					
4	0.30	2.33	5.74						
7	2.89	18.13	64.23	260.0					
24	1.36	8.08	28.39	272.0					
25	0.69	1.88	2.03	24.0					
Total		226.75	683.31						
Average		6.30	18.98			33.8	122.8	54	0.72
Minimum		0.67	1.08	10.0	6.2	10.6	48.3	10	0.02
Maximum*		26.53	126.05	315.0	6.8	54.3	350.0	200	6.80

Number of CSO events 33

NA = No Activation.

* = Per the NPDES permit, maximum chlorine residual is the highest single sample.

Boxed dates indicate a single event spread out over multiple days.

Table C-2. Prison Point CSO Facility Effluent Characterization, FY06

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
Metals (ug/L)															
ALUMINUM	~	~	~	~	1420	~	~	~	NA	3100	2120	~	2213.33	3100.00	3 of 3
CADMIUM	~	~	~	~	0.402	~	~	~	NA	0.942	0.535	~	0.63	0.94	3 of 6
CHROMIUM	~	~	~	~	8.48	~	~	~	NA	21	20.3	~	16.59	21.00	3 of 3
COPPER	~	~	~	~	44.5	~	~	~	NA	124	74.4	~	80.97	124.00	3 of 3
LEAD	~	~	~	~	49	~	~	~	NA	152	90.8	~	97.27	152.00	3 of 3
MERCURY	~	~	~	~	0.115	~	~	~	NA	0.224	0.12	~	0.15	0.22	3 of 4
NICKEL	~	~	~	~	4.56	~	~	~	NA	6.26	6.98	~	5.93	6.98	3 of 3
ZINC	~	~	~	~	167	~	~	~	NA	407	235	~	269.67	407.00	3 of 3
Surfactants and Total Organic Carbon (mg/L)															
SURFACTANTS	~	~	~	~	0.382	~	~	~	NA	1.21	1.11	~	0.90	1.21	3 of 3
TOTAL ORGANIC CARBON	~	~	~	~	9.31	~	~	~	NA	21	17.8	~	16.04	21.00	3 of 3

Table C-3. Prison Point CSO Facility Effluent Loadings, FY06

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
Metals (lbs/day)															
ALUMINUM	~	~	~	~	220.04	~	~	~	NA	27.92	164.25	~	137.41	220.04	3 of 3
CADMIUM	~	~	~	~	0.06	~	~	~	NA	0.01	0.04	~	0.04	0.06	3 of 6
CHROMIUM	~	~	~	~	1.31	~	~	~	NA	0.19	1.57	~	1.03	1.57	3 of 3
COPPER	~	~	~	~	6.90	~	~	~	NA	1.12	5.76	~	4.59	6.90	3 of 3
LEAD	~	~	~	~	7.59	~	~	~	NA	1.37	7.04	~	5.33	7.59	3 of 3
MERCURY	~	~	~	~	0.02	~	~	~	NA	0.002	0.01	~	0.01	0.02	3 of 4
NICKEL	~	~	~	~	0.71	~	~	~	NA	0.06	0.54	~	0.43	0.71	3 of 3
ZINC	~	~	~	~	25.88	~	~	~	NA	3.67	18.21	~	15.92	25.88	3 of 3
Surfactants and Total Organic Carbon (lbs/day)															
SURFACTANTS	~	~	~	~	59.19	~	~	~	NA	10.90	86.00	~	52.03	86.00	3 of 3
TOTAL ORGANIC CARBON	~	~	~	~	1442.65	~	~	~	NA	189.15	1379.12	~	1003.64	1442.65	3 of 3

NA: No activation

~: Activation that month, but no data or no sample taken

Results in **bold** indicate one or more detects in the month.

Yearly averages are calculated from individual results collected in the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Appendix D

Table D-1	Somerville Marginal CSO Facility Operations Summary, Fiscal Year 2006
Table D-2	Somerville Marginal CSO Facility Effluent Characterization, Fiscal Year 2006
Table D-3	Somerville Marginal CSO Facility Effluent Loadings, Fiscal Year 2006

Table D-1. Somerville Marginal CSO Facility Operations Summary, FY06

Date	Rainfall	Discharge			Effluent				
		duration (hrs)	Total volume (MG)	Peak flow (MG)	pH (SU)	BOD (mg/L)	TSS (mg/L)	Fecal coliform (col/100mL)	Chlorine residual (mg/L)
July									
6	2.04	5.08	7.68	74					
8	0.95	2.67	2.22	50.9					
August									
2	0.01	1.47	1.40	74.0					
11	0.23	0.82	0.75	46.2					
14	0.60	0.25	0.28	36.0					
September									
15	0.98	0.90	1.25	72.1					
29	0.24	0.52	0.40	44.0					
October									
8	1.02	2.00	2.18	29.0					
9	0.92	6.92	6.70	70.0					
14	1.22	1.90	3.13	60.0	7.7		62.0	10	3.40
15	2.89	17.43	28.08				117.0	10	0.03
							29.0	10	0.03
							11.0	10	0.03
							13.0	10	0.03
							10.0	10	0.03
							11.0	10	0.03
							16.0	10	0.03
							10.0	10	0.03
							10.0	10	0.04
							22.0	10	0.03
							15.0	10	0.03
							17.0	10	0.03
							11.0	40	0.03
							13.0	70	0.03
							22.0	10	0.03
							35.0	10	0.03
							36.0	30	0.03
							48.0	10	0.07
							16.0	10	0.03
23	0.46	1.42	0.83	65.0	8.2	40.6	158.0	10	0.03
25	1.26	10.05	5.01	28.0					
November									
22	1.61	3.58	3.17	41.7					
30	0.64	0.50	0.57	46.0					
December									
16	0.84	1.85	1.55	53.0					
January									
14	0.90	2.83	1.04	23.0	6.9	28.0	164.0	70	0.03
							95.0	20	0.03
							57.0	30	0.03
							52.0	10	0.03
18	0.69	2.37	1.79	70.0					
29	0.34	0.30	0.12	22.0					
February									
3	0.61	0.42	0.29	41.4					
4	0.45	1.42	1.06	41.4					
March									
14	0.25	0.45	0.30	50.0					
April									
23	0.61	0.67	0.46	30.0	8.3	24.8	65.0	10	0.03
24	0.13	0.25	0.23						
May									
2	0.91	0.65	0.29	28.3					
9	0.96	3.87	1.20	32.1					
10	0.55	1.12	0.97	55.0					
13	3.84	17.88	21.90	20.0					
14	3.77	24.00	29.39	120.0					
15	0.36	8.17	10.00	119.0					
16	0.52	1.58	0.78	33.6					
June									
3	1.91	3.42	1.59	25.0					
7	2.89	15.26	15.02	86.7					
23	1.36	2.58	6.97	148.0					
Total		144.60	158.60						
Average		4.25	4.66	54.2		31.1	80.3	13	0.70
Minimum		0.25	0.12	20.0	6.9	24.8	24.3	10	0.03
Maximum*		24.00	29.39	148.0	8.3	40.6	158.0	25	3.40

Number of CSO events 30

NA = No Activation.

* = Per the NPDES permit, maximum chlorine residual is the highest single sample.

Boxed dates indicate a single event spread out over multiple days.

Table D-2. Somerville Marginal CSO Facility Effluent Characterization, FY06

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
Metals (ug/L)															
ALUMINUM	~	~	~	617.00	~	~	1120.00	~	~	~	1590.00	~	1109.00	1590.00	5 of 5
CADMIUM	~	~	~	0.23	~	~	0.35	~	~	~	0.29	~	0.29	0.35	4 of 9
CALCIUM	~	~	~	8417.50	~	~	7740.00	~	~	~	6470.00	~	7542.50	11200.00	5 of 5
CHROMIUM	~	~	~	11.07	~	~	10.40	~	~	~	12.20	~	11.22	16.75	5 of 5
COPPER	~	~	~	19.05	~	~	27.30	~	~	~	34.20	~	26.85	34.20	5 of 5
LEAD	~	~	~	24.00	~	~	25.00	~	~	~	62.40	~	37.13	62.40	4 of 5
MAGNESIUM	~	~	~	4015.00	~	~	3040.00	~	~	~	8540.00	~	5198.33	8540.00	5 of 5
MERCURY	~	~	~	0.17	~	~	0.03	~	~	~	0.15	~	0.12	0.26	4 of 4
NICKEL	~	~	~	1.86	~	~	3.54	~	~	~	6.09	~	3.83	6.09	3 of 7
ZINC	~	~	~	76.53	~	~	120.00	~	~	~	136.00	~	110.84	136.00	5 of 5
Surfactants and Total Organic Carbon (mg/L)															
SURFACTANTS	~	~	~	1.83	~	~	1.16	~	~	~	0.77	~	1.25	2.25	4 of 4
TOTAL ORGANIC CARBON	~	~	~	8.88	~	~	12.80	~	~	~	15.20	~	12.29	15.20	4 of 4

Table D-3. Somerville Marginal CSO Facility Effluent Loadings, FY06

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
Metals (lbs/day)															
ALUMINUM	~	~	~	10.73	~	~	9.71	~	~	~	15.91	~	12.12	17.57	5 of 5
CADMIUM	~	~	~	0.004	~	~	0.003	~	~	~	0.003	~	0.003	0.01	4 of 9
CALCIUM	~	~	~	165.69	~	~	67.13	~	~	~	64.75	~	99.19	292.37	5 of 5
CHROMIUM	~	~	~	0.13	~	~	0.09	~	~	~	0.12	~	0.11	0.14	5 of 5
COPPER	~	~	~	0.31	~	~	0.24	~	~	~	0.34	~	0.29	0.47	5 of 5
LEAD	~	~	~	0.45	~	~	0.22	~	~	~	0.62	~	0.43	0.79	4 of 5
MAGNESIUM	~	~	~	66.92	~	~	26.37	~	~	~	85.47	~	59.59	106.51	5 of 5
MERCURY	~	~	~	0.002	~	~	0.0003	~	~	~	0.002	~	0.001	0.002	4 of 4
NICKEL	~	~	~	0.03	~	~	0.03	~	~	~	0.06	~	0.04	0.06	3 of 7
ZINC	~	~	~	1.23	~	~	1.04	~	~	~	1.36	~	1.21	1.90	5 of 5
Surfactants and Total Organic Carbon (lbs/day)															
SURFACTANTS	~	~	~	29.37	~	~	0.01	~	~	~	0.01	~	9.80	58.73	4 of 4
TOTAL ORGANIC CARBON	~	~	~	142.29	~	~	0.11	~	~	~	0.15	~	47.52	284.54	4 of 4

NA: No activation

~: Activation that month, but no data or no sample taken

Results in **bold** indicate one or more detects in the month.

Yearly averages are calculated from individual results collected in the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Appendix E

Table E-1	Fox Point CSO Facility Operations Summary, Fiscal Year 2005
Table E-2	Fox Point CSO Facility Effluent Characterization, Fiscal Year 2005
Table E-3	Fox Point CSO Facility Effluent Loadings, Fiscal Year 2005

Table E-1. Fox Point CSO Facility Operations Summary, FY06

Date	Rainfall	Discharge duration (hrs)	Total volume (MG)	Peak flow (MG)	pH (SU)	BOD (mg/L)	TSS (mg/L)	Effluent Fecal coliform (col/100mL)	Chlorine residual (mg/L)
July									
6	2.04	3.63	4.48	37.00					
8	0.95	2.5	2.36	36.00					
August									
2	0.01	3.57	5.29	185.00					
5	0.55	2.10	1.70	33.70					
14	0.60	4.38	3.81	100.00					
September									
15	0.98	4.43	3.50	120.00	7.7	10.9	57.0	10	0.03
							46.0	10	0.03
							1180.0	100	0.03
29	0.24	0.50	0.30	24.00					
October									
9	0.92	7.75	8.03	48.00					
14	1.22	1.10	1.72	25.00					
15	2.89	14.95	26.42	109.00					
23	0.46	2.43	2.40	23.00					
25	1.26	3.73	2.81	27.00	8.2	8.5	11.0	10	0.03
							12.0	10	0.03
							60.0	360	6.00
November									
10	0.36	2.75	2.35	19.20	6.7	14.4	57.0	10	0.03
17	0.15	1.38	0.39	25.00	7.1	8.7	30.0	10	0.03
					7.5		13.0	10	0.03
22	1.61	5.72	2.94	24.00					
30	0.64	2.83	1.96	27.60					
December									
16	0.84	3.62	3.68	37.00					
29	0.24	1.37	0.74	23.70					
January									
14	0.90	4.27	3.45	28.00					
15	0.39	2.78	1.57	27.00					
18	0.69	3.58	2.99	46.30					
February									
3	0.61	2.50	1.94	19.80					
4	0.45	2.30	2.04	37.40					
5	0.34	2.35	1.49	23.00					
March									
14	0.25	0.28	0.17	16.70					
April									
4	0.36	1.23	1.58	18.00					
23	0.61	0.42	0.34	18.00					
24	0.13	2.50	2.01						
May									
2	0.91	3.25	2.75	35.10					
9	0.96	4.28	2.64	38.00					
10	0.55	4.20	2.37	36.00					
13	3.84	11.25	15.97	40.00					
14	3.77	15.77	28.48	93.80					
15	0.36	7.45	6.81	41.00					
19	0.47	1.80	1.17	23.00					
26	0.27	0.83	0.87	25.00					
June									
1	0.12	1.08	0.77	35.00					
2	0.53	9.53	9.33	56.70					
4	0.30	0.47	0.16	18.00					
7	2.89	12.38	16.97	50.00					
23	1.36	2.30	7.36	120.00					
24	0.69	2.93	2.35	100.00					
25	0.95	3.77	2.93	24.00					
Total		172.24	193.39						
Average		4.01	4.50			10.6	133.5	16	0.53
Minimum		0.28	0.16	16.70	6.7	8.5	21.5	10	0.03
Maximum*		15.77	28.48	185.00	8.2	14.4	427.7	33	2.02

Number of CSO events 40

NA = No Activation.

* = Per the NPDES permit, maximum chlorine residual is the highest single sample.

Boxed dates indicate a single event spread out over multiple days.

Table E-2. Fox Point CSO Facility Effluent Characterization, FY06

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
Metals (ug/L)															
ALUMINUM	~	~	2020.00	408.50	~	~	~	~	~	~	~	~	1214.25	2020.00	3 of 3
CADMIUM	~	~	0.31	0.20	~	~	~	~	~	~	~	~	0.26	0.31	2 of 5
CHROMIUM	~	~	8.27	5.83	~	~	~	~	~	~	~	~	7.05	8.27	3 of 3
COPPER	~	~	23.90	11.65	~	~	~	~	~	~	~	~	17.78	23.90	3 of 3
LEAD	~	~	73.10	14.90	~	~	~	~	~	~	~	~	44.00	73.10	2 of 4
MERCURY	~	~	0.27	0.04	~	~	~	~	~	~	~	~	0.15	0.27	2 of 2
NICKEL	~	~	5.14	5.94	~	~	~	~	~	~	~	~	5.54	5.94	3 of 3
ZINC	~	~	109.00	64.05	~	~	~	~	~	~	~	~	86.53	109.00	3 of 3
Surfactants and Total Organic Carbon (mg/L)															
SURFACTANTS	~	~	0.51	0.20	~	~	~	~	~	~	~	~	0.36	0.51	2 of 2
TOTAL ORGANIC CARBON	~	~	15.00	9.29	~	~	~	~	~	~	~	~	12.15	15.00	2 of 2

Table E-3. Fox Point CSO Facility Effluent Loadings, FY06

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
Metals (lbs/day)															
ALUMINUM	~	~	58.96	12.98	~	~	~	~	~	~	~	~	35.97	58.96	3 of 3
CADMIUM	~	~	0.01	0.01	~	~	~	~	~	~	~	~	0.01	0.01	2 of 5
CHROMIUM	~	~	0.24	0.19	~	~	~	~	~	~	~	~	0.21	0.24	3 of 3
COPPER	~	~	0.70	0.37	~	~	~	~	~	~	~	~	0.53	0.70	3 of 3
LEAD	~	~	2.13	0.47	~	~	~	~	~	~	~	~	1.30	2.13	2 of 4
MERCURY	~	~	0.01	0.001	~	~	~	~	~	~	~	~	0.005	0.01	2 of 2
NICKEL	~	~	0.15	0.19	~	~	~	~	~	~	~	~	0.17	0.19	3 of 3
ZINC	~	~	3.18	2.04	~	~	~	~	~	~	~	~	2.61	3.18	3 of 3
Surfactants and Total Organic Carbon (lbs/day)															
SURFACTANTS	~	~	14.95	6.36	~	~	~	~	~	~	~	~	10.65	14.95	2 of 2
TOTAL ORGANIC CARBON	~	~	437.85	295.19	~	~	~	~	~	~	~	~	366.52	437.85	2 of 2

NA: No activation

~: Activation that month, but no data or no sample taken

Results in **bold** indicate one or more detects in the month.

Yearly averages are calculated from individual results collected in the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Appendix F

Table F-1	Commercial Point CSO Facility Operations Summary, Fiscal Year 2005
Table F-2	Commercial Point CSO Facility Effluent Characterization, Fiscal Year 2005
Table F-3	Commercial Point CSO Facility Effluent Loadings, Fiscal Year 2005

Table F-1. Commercial Point CSO Facility Operations Summary, FY06

Date	Rainfall	Discharge duration (hrs)	Total volume (MG)	Peak flow (MG)	pH (SU)	BOD (mg/L)	Effluent		Chlorine residual (mg/L)
							TSS (mg/L)	Fecal coliform (col/100mL)	
July									
6	2.04	2.05	2.32	51					
8	0.95	2.72	2.89	29.4					
August									
2	0.01	1.67	2.32	99.5					
14	0.60	4.35	3.72	100					
September									
15	0.98	3.4	5.19	106	6.8	13.6	146	31000	0.03
							222.0	30	0.03
							250.0	10	0.03
29	0.24	0.42	0.37	36.00					
October									
9	0.92	4.17	5.35	93.00					
15	2.89	16.92	31.09	63.00	7.8	8.6	13.0	10	0.03
							57.0	15000	0.03
							337.0	220	0.03
							81.0	30	0.03
							48.0	10	0.03
							36.0	10	0.03
							42.0	10	0.03
							76.0	40	0.03
							27.0	10	0.03
							29.0	10	0.03
							19.0	10	0.03
							23.0	10	0.03
							22.0	10	0.03
							33.0	10	0.03
							38.0	10	0.03
							53.0	10	0.03
							34.0	10	0.03
25	1.26	6.08	5.31	38.00	6.8	8.8	15.0	10	0.03
							14.0	10	26.30
							20.0	10	0.03
							19.0	10	0.03
							21.0	10	0.03
							22.0	100	0.03
							19.0	10	0.03
November									
17	0.15	1.82	1.19	17.70					
22	1.61	5.60	5.73	46.80					
30	0.64	1.67	2.20	35.00					
December									
16	0.84	1.92	1.32	24.00					
25	0.21	0.67	0.54	30.00					
26	0.77	0.55	0.45						
29	0.24	1.00	0.76	21.10					
January									
14	0.90	2.65	2.11	29.00					
15	0.39	2.82	2.63	45.20					
18	0.69	3.68	2.97	48.20	6.9	7.4	35.0	130	0.15
							62.0	10	0.03
29	0.34	0.55	0.49	32.00					
February									
3	0.61	1.78	0.98	17.00					
4	0.45	2.32	2.49	56.00					

Table F-1. Commercial Point CSO Facility Operations Summary, FY06

Date	Rainfall	Discharge duration (hrs)	Total volume (MG)	Peak flow (MG)	pH (SU)	BOD (mg/L)	TSS (mg/L)	Effluent Fecal coliform (col/100mL)	Chlorine residual (mg/L)
March									
NA									
April									
4	0.36	1.50	1.18	22.00					
23	0.61	1.80	1.68	23.00					
May									
2	0.91	2.77	3.79	30.50					
9	0.96	4.17	4.62	40.00					
10	0.55	1.43	1.59						
13	3.84	12.08	18.83	146.00					
14	3.77	20.75	34.69						
15	0.36	3.63	3.33	25.00					
16	0.52	1.58	1.47	28.00					
19	0.47	3.55	1.50	27.00					
26	0.27	1.43	1.54	32.70					
June									
1	0.12	0.78	0.64	29.00					
2	0.53	3.63	1.46	58.00					
3	1.91	8.30	9.16	54.00					
7	2.89	15.65	25.72	100.00					
10	0.43	2.22	1.44	25.00					
23	1.36	4.12	8.99	40.00					
24	0.69	1.08	1.56	100.00					
25	0.95	0.92	0.82	30.00					
Total		160.20	206.43						
Average		3.91	5.03			9.6	82.5	39	0.98
Minimum		0.42	0.37	17.00	6.8	7.4	18.6	14	0.03
Maximum*		20.75	34.69	146.00	7.8	13.6	206.0	210	26.30

Number of CSO events 37

NA = No Activation.

* = Per the NPDES permit, maximum chlorine residual is the highest single sample.

Boxed dates indicate a single event spread out over multiple days.

Table F-2. Commercial Point CSO Facility Effluent Characterization, FY06

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
Metals (ug/L)															
ALUMINUM	~	~	1940.00	1290.00	~	~	~	~	~	~	~	~	1615.00	1940.00	2 of 2
CADMIUM	~	~	0.45	0.28	~	~	~	~	~	~	~	~	0.36	0.45	2 of 4
CHROMIUM	~	~	20.30	4.73	~	~	~	~	~	~	~	~	12.52	20.30	2 of 2
COPPER	~	~	28.00	18.40	~	~	~	~	~	~	~	~	23.20	28.00	2 of 2
LEAD	~	~	61.00	58.40	~	~	~	~	~	~	~	~	59.70	61.00	2 of 2
MERCURY	~	~	0.07	0.12	~	~	~	~	~	~	~	~	0.10	0.12	2 of 2
NICKEL	~	~	6.43	5.52	~	~	~	~	~	~	~	~	5.98	6.43	2 of 2
ZINC	~	~	99.90	80.00	~	~	~	~	~	~	~	~	89.95	99.90	2 of 2
Surfactants and Total Organic Carbon (mg/L)															
SURFACTANTS	~	~	0.76	0.78	~	~	~	~	~	~	~	~	0.77	0.78	2 of 2
TOTAL ORGANIC CARBON	~	~	17.50	7.62	~	~	~	~	~	~	~	~	12.56	17.50	2 of 2

Table F-3. Commercial Point CSO Facility Effluent Loadings, FY06

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average	Maximum	Times Detected
Metals (ug/L)															
ALUMINUM	~	~	83.97	334.48	~	~	~	~	~	~	~	~	209.23	334.48	2 of 2
CADMIUM	~	~	0.019	0.07	~	~	~	~	~	~	~	~	0.05	0.07	2 of 4
CHROMIUM	~	~	0.88	1.23	~	~	~	~	~	~	~	~	1.05	1.23	2 of 2
COPPER	~	~	1.21	4.77	~	~	~	~	~	~	~	~	2.99	4.77	2 of 2
LEAD	~	~	2.64	15.14	~	~	~	~	~	~	~	~	8.89	15.14	2 of 2
MERCURY	~	~	0.003	0.03	~	~	~	~	~	~	~	~	0.02	0.03	2 of 2
NICKEL	~	~	0.28	1.43	~	~	~	~	~	~	~	~	0.85	1.43	2 of 2
ZINC	~	~	4.32	20.74	~	~	~	~	~	~	~	~	12.53	20.74	2 of 2
Surfactants and Total Organic Carbon (mg/L)															
SURFACTANTS	~	~	33.03	202.25	~	~	~	~	~	~	~	~	117.64	202.25	2 of 2
TOTAL ORGANIC CARBON	~	~	757.48	1975.79	~	~	~	~	~	~	~	~	1366.64	1975.79	2 of 2

NA: No activation

~: Activation that month, but no data or no sample taken

Results in **bold** indicate one or more detects in the month.

Yearly averages are calculated from individual results collected in the fiscal year.

Non-detected compounds are assumed to equal one half of the detection limit for metals and inorganics and one tenth of the reporting limit for organic compounds.

Appendix G: NPDES Monitoring Requirements

Overview

The Environmental Protection Agency (EPA) mandates that any discharge to a body of water must be permitted through the National Pollutant Discharge Elimination System (NPDES). The EPA and the Massachusetts Department of Environmental Protection (DEP) jointly issued a NPDES permit to MWRA for the Deer Island treatment plant and six CSO treatment facilities: Cottage Farm, Prison Point, Somerville Marginal, Constitution Beach, Fox Point, and Commercial Point.

The limits set in the MWRA NPDES permit are limitations for secondary treatment plants. In March 2001, secondary Battery C underwent start-up at Deer Island, substantially finishing the construction process at the plant. Before the completion of Battery C, though, plant effluent was already largely in compliance with the new permit. Additionally, in September of 2000, Constitution Beach, one of the six permitted CSO facilities, shut down, leaving five permitted and operational CSO facilities.

In addition, MWRA monitors the influent quality of wastewater. Those monitoring results provide the basis for determining the adequacy of existing local limits to protect the treatment plants and Boston Harbor. Local Limits, enforced by MWRA's Toxic Reduction and Control (TRAC) department, allow the discharge of toxic chemicals from industrial sources to be regulated. The MWRA submitted proposed local limits in FY00 reflecting the new secondary treatment requirements. Regulators approved the new local limits and they became effective in June 2003, at the end of FY03. Under the pretreatment program requirements, local limits must be re-evaluated every five years.

MWRA not only monitors to comply with the NPDES effluent requirements, but also has its own monitoring programs, including monitoring at DITP, Boston Harbor, and Massachusetts Bay. These monitoring programs serve to assure appropriate control of discharges to the system, to assure the most cost-effective wastewater treatment while meeting water quality standards, and to assure the quality of life of the organisms and health of the animal communities living in the receiving waters.

MWRA's current NPDES permit expired in August 2005. MWRA has applied for a new permit. However, as of the end of FY06, EPA has not issued a new NPDES permit for Deer Island and the CSO facilities. In lieu of a new permit, the limits of the old permit remain in force.

G.1 NPDES Permit

Under the NPDES permit, "in compliance with the provisions of the Clean Water Act, as amended, 33 U.S.C. §§ 1251 et seq., and the Massachusetts Clean Water Act, as amended, Mass. Gen. Laws, ch. 21, §§ 26-53, Massachusetts Water Resources Authority is authorized to discharge from MWRA Publicly Owned Treatment Works, Deer Island Treatment Plant, Deer Island, Boston, MA 02152 (Discharge serial number T01), which discharges to receiving waters located in Massachusetts Bay, which is adjacent to Cape Cod Bay, and a part of the Gulf of Maine; and from Combined Sewer Overflow

Outfalls, which discharge to the Charles River, Inner Harbor, Mystic River, Boston Harbor, Dorchester Bay, Alewife Brook; in accordance with effluent limitations, monitoring requirements and other conditions set in the permit...”

**G.1.a
Monitoring
Requirements
and Effluent
Limitations**

The NPDES permit establishes monitoring requirements for the new Deer Island outfall tunnel (T01). The permit also regulates CSO treatment facility outfalls at Cottage Farm (MWR201), Prison Point (MWR203), Somerville Marginal (which has two outfalls from a single facility, the primary outfall, MWR205, and the relief outfall, MWR205A), Constitution Beach (MWR207, now closed), Fox Point (MWR209), and Commercial Point (MWR211). The permit also establishes a comprehensive receiving water monitoring plan, the Ambient Monitoring Plan, in Massachusetts Bay.

**G.1.b
Reporting
Requirements**

In addition to Deer Island and CSO monitoring requirements, the NPDES permit requires numerous reports on the state of MWRA sewerage and operational systems. These include reports on infiltration/inflow, CSO facilities and collection systems maintenance and inspection, operational upsets, dry weather and sanitary sewer overflows, operational bypasses, monthly Discharge Monitoring Reports (DMRs), and reporting on the effects of discharges through the Ambient Monitoring Plan. In addition, the Contingency Plan mandates a number of additional thresholds and stipulates actions needed if they are exceeded. Table G-1 presents a summary of the permit limits and monitoring requirements for Deer Island and Table G-2 does the same for the CSOs.

Table G-1. Effluent Limitations and Monitoring Requirements for DITP Outfall T01			
Effluent Characteristic	Discharge Limitation		
	Average Monthly	Average Weekly	Maximum Daily
Flow	Report*	N/A	Report
Dry Day Flow	436 MGD	N/A	Report
cBOD	25 mg/L	40 mg/L	Report
TSS	30 mg/L	45 mg/L	Report
pH	Not less than 6.0 nor greater than 9.0 at any time.		
Fecal Coliform ^a	N/A	14,000 colonies/100mL	14,000 colonies/100mL
Chlorine, Total Residual	456 µg/L	N/A	631 µg/L
PCBs, Arochlors: 1016, 1221, 1232, 122, 1248, 1254, 1260	0.000045 µg/L	N/A	Report
Settleable Solids	N/A	Report	Report
Chlorides, Influent	N/A	N/A	Report
Mercury	Report	N/A	Report
Chlordane	Report	N/A	Report
4,4-DDT	Report	N/A	Report
Dieldrin	Report	N/A	Report
Heptachlor	Report	N/A	Report
Ammonia-Nitrogen	Report	N/A	N/A
Total Kjeldahl Nitrogen	Report	N/A	N/A
Total Nitrate	Report	N/A	N/A
Total Nitrite	Report	N/A	N/A
Cyanide, Total	Report	N/A	Report
Copper, Total	Report	N/A	Report
Arsenic, Total	Report	N/A	Report
Hexachlorobenzene	Report	N/A	Report
Aldrin	Report	N/A	Report
Heptachlor Epoxide	Report	N/A	Report
PCBs, Total	Report	N/A	Report
Volatile Organic Compounds	Report	N/A	Report
LC50 ^b	Tests involve using mysid shrimp (<i>Mysidopsis bahia</i>) and inland silverside (<i>Menidia beryllina</i>) in 48 hour acute toxicity tests. LC50 must be achieved in a solution that is 50% effluent.		
C-NOEC ^c	C-NOEC tests involve larval inland silverside (<i>Menidia beryllina</i>) and sea urchin (<i>Arbacia punctulata</i>). <i>Menidia</i> tests involve a week's worth of exposure to various effluent concentrations. The <i>Arbacia</i> toxicity test tests fertilization in the test organism. In both cases, no chronic effects must be observed in a solution composed of 1.5% effluent.		
Footnotes * , a, b, and c are listed underneath Table G-2 on the next page.			

Effluent Characteristic	Discharge Limitation	
	Average Monthly	Average Weekly
Rainfall	Report*	Report
Flow	Report	Report
TSS	Report	Report
BOD	Report	Report
Chlorine, Total Residual	0.1 mg/L	0.25 mg/L max hourly
pH	Not less than 6.5 nor greater than 8.5	
Fecal Coliform	Must meet Massachusetts Water Quality Standards	
LC50 ^b	<p>Since Cottage Farm and Somerville Marginal's relief outfall both discharge in freshwater, acute toxicity tests are required with daphnids (<i>Ceriodaphnia dubia</i>) and fathead minnows (<i>Pimephales promelas</i>). There is no limit to effluent concentration used to determine LC50, but results are reportable.</p> <p>All other CSO facilities discharge to marine waters, so the acute test organisms are mysid shrimp (<i>Mysidopsis bahia</i>) and inland silverside (<i>Menidia beryllina</i>). LC50 results are reportable.</p>	
<p>* No limit, but values reported to EPA and DEP. ^a There are two other fecal coliform limits. The first is that not more than 10% of the individual samples collected in a month can have a count higher than 14,000 colonies/100mL. Typically, given 3 samples a day, this means no more than 9 samples can have a count higher than 14,000 in a given month. The second limit is that no more than 3 consecutive samples can exceed 14,000 colonies/100mL. ^b LC50: the concentration of effluent in a sample that causes mortality in 50% of the test population at a specific time of observation. ^c C-NOEC: Chronic No Observed Effect Concentration is the highest concentration of effluent to which organisms are exposed in a life cycle or partial life cycle test which has no adverse effects (on growth, survival and reproduction).</p>		

**G.2
Monitoring
Programs**

In FY06, MWRA conducted several monitoring programs. However, this report presents only the influent and effluent monitoring programs. The receiving water monitoring programs are too complex to cover in a single document. More information on monitoring in Massachusetts Bay and Boston Harbor can be found at: <http://www.mwra.com/harbor/html/bhrecov.htm>

**G.2.a
Treatment
Plant
Monitoring**

Monitoring at DITP has two main components: influent monitoring and effluent monitoring.

Influent monitoring characterizes the influent to the Deer Island Treatment Plant. Monitoring for conventional parameters is necessary for some parameters to meet NPDES reporting requirements, but monitoring many other parameters is critical for process control to ensure optimal plant functioning. Influent monitoring data provides influent loading rates and the basis for determining treatment plant efficiency. Influent monitoring for non-conventional parameters is an important part of MWRA's source reduction and Local Limits program run by TRAC.

Effluent monitoring characterizes the quality of the effluent discharged to Massachusetts Bay. With the addition of whole effluent toxicity (WET) testing, the parameters measured in the effluent are similar to those measured in the influent. The NPDES permit requires effluent monitoring and imposes permit limits on both conventional and priority pollutants to ensure the health of the receiving water. Additionally, the permit also requires the reporting of non-priority pollutants such as nutrients, although no limits are set on them.

Table G-3 lists the treatment plant monitoring program parameters, including sample type, sampling frequency and analytical procedures used.

**G.2.b
Combined
Sewer
Overflow
Facilities
Monitoring
Program**

The CSO Monitoring Program includes influent and effluent monitoring at the five CSO facilities (the sixth, Constitution Beach, was closed in early FY01). Influent and effluent samples are collected and tested for conventional parameters at all five CSO facilities. Selected priority pollutants and metals are also analyzed in the effluent. Table G-4 lists the CSO monitoring program parameters, including sample type, sampling frequency and analytical procedures used.

**G.2.c
Sewer System
Monitoring
Program**

The sewer system monitoring program, which attempts to identify Sanitary Sewer Overflows (SSOs), involves conducting visual inspections of areas in the separate sewer system that have a history of discharging during or shortly after a heavy rainfall event. Because of the hydraulics of the South System, discharges occur in manholes or other low-lying areas, while discharges in the North System are the result of combined sewage overwhelming sewage system capacity.

**G.3
Treatment of
Results**

It can be difficult to interpret laboratory results to ensure that they are representative of the sample, especially when the results are at or below method detection levels. For the conventional parameters measured in these monitoring programs, calculating the average concentration of a particular parameter is straightforward: the arithmetic average is used. However, the concentrations of metals, pesticides and organics are frequently below method detection levels, and data are manipulated. Appendix J gives a brief description of method detection limits and how measurements below detection limits are treated in this report.

Daily loadings (in lbs/day) were calculated using the formula:

$$\begin{aligned} \text{Loading} &= Q \times C \times 8.34 \\ Q &= \text{flow (mgd)} \\ C &= \text{concentration (mg/L)} \\ 8.34 &= \text{unit conversion factor} \end{aligned}$$

To calculate monthly average concentrations for priority pollutants (metals, cyanide, pesticides/PCBs and organic compounds), the loadings of the pollutant during each sampling event for that month were added and then divided by the total flow during those events.

Average annual concentrations were calculated using the same method, taking each individual sampling event into account in the calculation.

It should be kept in mind that with the large flows going through the Deer Island Treatment Plant, taking one small sample might not always be truly representative. It is also important to keep in mind that certain parameters (conventional) were analyzed daily while other parameters (priority pollutants) were analyzed only two or three times per month.

Table G-3. POTW Monitoring Program				
Parameter	Sample Type ¹	Sampling Frequency		Analytical Method ²
		Influent	Effluent	
Metals				
Aluminum	Composite	2 x month	Weekly	200.7
Antimony	Composite	2 x month	2 x month	200.7
Arsenic	Composite	2 x month	2 x month	200.7, 206.2
Beryllium	Composite	2 x month	2 x month	200.7
Boron	Composite	2 x month	2 x month	200.7
Cadmium	Composite	2 x month	Weekly	200.7, 213.2
Chromium	Composite	2 x month	Weekly	200.7, 218.2
Chromium (Hexavalent)	Composite	2 x month	2 x month	3500-CRD ³
Copper	Composite	2 x month	Weekly	200.7, 200.8, 220.2
Iron	Composite	2 x month	2 x month	200.7
Lead	Composite	2 x month	Weekly	200.7, 239.2
Mercury	Composite	2 x month	Weekly	245.2, 1631
Molybdenum	Composite	2 x month	Weekly	200.7, 246.2
Nickel	Composite	2 x month	Weekly	200.7, 249.2
Selenium	Composite	2 x month	2 x month	200.7, 270.2
Silver	Composite	2 x month	Weekly	200.7, 272.2
Thallium	Composite	2 x month	2 x month	200.7, 279.2
Zinc	Composite	2 x month	Weekly	200.7
Organics and Other Compounds				
Cyanide	Grab	2 x month	4 x month	335.2
Fats, Oils, and Grease	Grab	2 x month	Weekly	1664
MBAS	Composite	2 x month	2 x month	425.1
PAHs	Composite	2 x month	Weekly	
PCBs	Composite	2 x month	Weekly	8080 MOD
Pesticides	Composite	2 x month	Weekly	608
Petroleum Hydrocarbons	Grab	2 x month	Weekly	418.1
Phenol	Composite	2 x month	Weekly	420.2 MO
Semi-volatile Organics	Composite	2 x month	2 x month	625
Sulfate	Composite	2 x month	*	300.0
Total Organic Carbon	Composite	*	2 x month	415.1
Volatile Organics	Grab	2 x month	2 x month	624
Whole Effluent Toxicity	Composite	*	1 x month	WET Test Protocols
Conventional				
Biochemical O ₂ Demand	Composite	Daily	Daily	5210 B ³
Carbonaceous BOD	Composite	Daily	Daily	5210 B ³
Chemical O ₂ Demand	Composite	Daily	Daily	HACH 8000
Chlorides	Composite	Daily	Daily	300.0
<i>Enterococci</i>	Grab	*	Daily	9230 C ³
Fecal Coliform	Grab	*	3 x Daily	9222 D ³
pH	Grab	Daily	Daily	150.1
Settleable Solids	Grab	Daily	Daily	160.5
Temperature	Grab	Daily	Daily	170.1
Total Chlorine Residual	Grab	*	3 x Daily	330.5
Total Coliform	Grab	*	3 x Daily	9222 B ³
Total Suspended Solids	Composite	Daily	Daily	160.2
Nutrients				
Alkalinity	Composite	Weekly	*	310.1
Ammonia	Composite	Weekly	Weekly	350.1
Nitrates	Composite	Weekly	Weekly	353.2
Nitrate/Nitrite	Composite	*	Weekly	353.2
Nitrites	Composite	Weekly	Weekly	353.2
Orthophosphorus	Composite	Weekly	*	365.1
Total Kjeldahl Nitrogen	Composite	Weekly	Weekly	351.2
Total Phosphorus	Composite	Weekly	*	365.1
* No sampling.				
¹ Influent and effluent composite samples are 24-hour time composite samples.				
² EPA Methods.				
³ Standard Methods.				

Table G-4. CSO Monitoring Program			
Parameter	Sample Type	Sampling Frequency	Analytical Method ¹
Biochemical O ₂ Demand	Grab/Composite ³	4 x year	5210 B ²
Fecal Coliform	Grab ⁴	4 x year	9222 D ²
pH	Grab	4 x year	150.1
Total Chlorine Residual	Grab ³	4 x year	330.5
Total Suspended Solids	Grab ³	4 x year	160.2
Whole Effluent Toxicity	Composite ⁵	2 x year	WET Test Protocols
¹ EPA Methods. ² Standard Methods. ³ A grab sample must be collected within the first 2 hours of activation (30 minutes for Somerville Marginal in the first permit year) and then hourly samples are to be taken for the duration of the overflow, for not longer than 24 hours. All BOD samples are then composited. ⁴ A grab sample must be collected within the first 2 hours of activation (30 minutes for Somerville Marginal in the first permit year) and then hourly samples are to be taken for the duration of the overflow, for not longer than 24 hours. During the first permit year, the first sample is held and subsampled hourly for fecal coliforms. ⁵ Cottage Farm and the Somerville Marginal relief outfall discharge to freshwater so the organisms used for toxicity testing are the daphnid <i>Ceriodaphnia dubia</i> and the fathead minnow <i>Pimephales promelas</i> . The other facilities discharge to marine waters, so the test organisms are the inland silverside <i>Menidia beryllina</i> and the mysid shrimp <i>Mysidopsis bahia</i> .			

Appendix H: An Overview of the MWRA Sewerage System and Facilities

Overview

The MWRA is responsible for the collection, transport, pumping, treatment, and disposal of sewage in Boston and the greater Boston area. In addition to the Deer Island Treatment Plant, the MWRA operates another treatment plant, serving the town of Clinton and the Lancaster Sewer District, under special arrangements that originated when the Metropolitan District Commission (MDC) acquired land in Clinton for the Wachusett Reservoir. The Clinton Treatment Plant operates under a separate permit from the Boston NPDES permit and is not discussed in this report.

The MWRA serves 43 communities with a total population of about two million people, 5,500 businesses, and 1,400 industries. More than 5,400 miles of town- and city-owned local sewers connect at over 1,800 points to over 230 miles of MWRA interceptor sewers. Also included in the vast sewerage system are sixteen pumping stations, five headworks, over 80 combined sewer relief overflows and five CSO treatment facilities. Table H-1 lists the MWRA treatment facilities and relevant information pertaining to each facility.

The Deer Island Treatment Plant in Winthrop serves the 43 communities in the metropolitan Boston sewerage system and is allowed to discharge under the Boston NPDES Permit. The sewerage system is divided into two major regions: the North and the South Systems. Table H-2 lists the sewerage service area population by community.

Table H-1. List of Treatment Facilities and Discharge Locations

Facility	Location	First Year of Operation	Treatment Process	Design Flow (mgd)	Conduit Size In	Conduit Size Out	Outfall Number	Receiving Water
Combined Sewer Overflow (CSO) Facilities								
Cottage Farm	Memorial Dr. near Boston University bridge, Cambridge, MA	1971	Screening	233	72" N. Charles Relief	96" outfall	MWR201	Charles River
			Settling		42" S. Charles Relief			
			Chlorination		54" Brookline			
		2001	Dechlorination					
Prison Point	Near Museum of Science bridge, Cambridge, MA	1980	Screening	385	10' diameter	8' diameter	MWR203	Boston Inner Harbor
			Settling					
			Chlorination					
		2001	Dechlorination					
Somerville Marginal	McGrath Highway under I-93, Somerville, MA	1973†	Screening	245	7' x 7.5'	6' x 8'	MWR205	Mystic River
			Chlorination		84" diameter			
		2001	Dechlorination					
Fox Point	Freeport St., Dorchester, MA	1989	Screening	119	10' x 12'	10' x 12'	MWR209	Dorchester Bay, Boston Harbor
			Chlorination					
		2003	Dechlorination					
Commercial Point	Victory Rd., Dorchester, MA	1991	Screening	194	15' x 11'	15' x 11'	MWR211	Dorchester Bay, Boston Harbor
			Chlorination					
		2003	Dechlorination					

† Rehabilitated in 1988

Table H-2. Sewerage Service Area Population By Community						
Town	Population ¹		MWRA Sewerage System		Population Served By	
	Total Community	Sewered	North	South	North System ²	South System ²
Arlington	42,140	42,098	x		42,098	
Ashland	15,392	10,774		x		10,774
Bedford	12,647	11,256	x		11,256	
Belmont	24,045	23,540	x		23,540	
Boston	589,281	588,692	x	x	418,056	136,836
Braintree	33,917	33,883		x		33,883
Brookline	57,032	56,462	x	x	29,381	23,991
Burlington	22,923	22,510	x		22,510	
Cambridge	101,807	101,705	x		101,705	
Canton	21,341	15,579		x		15,579
Chelsea	34,913	34,913	x		34,913	
Dedham	23,378	21,975		x		21,975
Everett	37,772	37,734	x		37,734	
Framingham	66,827	62,817		x		62,817
Hingham	6,782	6,126		x		6,126
Holbrook	10,877	8,484		x		8,484
Lexington	30,663	29,130	x		29,130	
Malden	56,155	56,099	x		56,099	
Medford	55,137	55,082	x		55,082	
Melrose	26,963	26,936	x		26,936	
Milton	26,010	24,449	x	x	1,843	22,279
Natick	32,384	27,332		x		27,332
Needham	29,197	27,854		x		27,854
Newton	83,880	82,202	x	x	42,786	35,390
Norwood	28,844	28,815		x		28,815
Quincy	89,187	89,098		x		89,098
Randolph	31,044	30,858		x		30,858
Reading	23,680	22,330	x		22,330	
Revere	47,496	47,449	x		47,449	
Somerville	76,922	76,845	x		76,845	
Stoneham	22,165	21,700	x		21,700	
Stoughton	27,227	17,698		x		17,698
Wakefield	24,817	23,757	x		23,757	
Walpole	23,199	15,079		x		15,079
Waltham	59,073	58,482	x		58,482	
Watertown	32,857	32,857	x		32,857	
Wellesley	26,671	25,684		x		25,684
Westwood	14,181	13,472		x		13,472
Weymouth	54,754	51,852		x		51,852
Wilmington	21,629	3,699	x		3,699	
Winchester	21,093	21,072	x		21,072	
Winthrop	18,235	18,235	x		18,235	
Woburn	38,003	36,103	x		36,103	
TOTAL	2,122,540	2,042,717			1,295,598	705,876

¹ Community population data are from MWRA's I/I program, August 2004 report.
MWRA's
I/I Program; this is the last estimate available (from the *FY00 NPDES Compliance Summary Report*, ENQUAD 2001-04).

**H.1
North System**

The North System serves a population of about 1.3 million and is located to the north and west of Boston. It covers an area of about 168 square miles. Most of the North System is a separate system – different conduits carry sanitary wastewater and storm water. However, portions of Boston, Cambridge, Somerville, and Chelsea still have combined sewers, where the same conduits carry sanitary and storm water. Combined sewers serve about 20 percent of the North System service area. Community sewer lines tie into the MWRA system through interceptor lines that feed into the four headworks facilities in the North System.

Two deep rock tunnels, the Boston Main Drainage Tunnel (BMDT) and the North Facilities Metropolitan Relief Tunnel (North Metro Relief), connect the three remote headworks to the North Main Pump Station (NMPS) on Deer Island. The seven-mile BMDT originates at the Ward Street Headworks, continues to the Columbus Park Headworks, and runs under Boston Harbor to the NMPS. The four-mile North Metro Relief Tunnel connects the Chelsea Creek Headworks to the NMPS. The two tunnels combined can handle approximately 800 mgd, matching the combined peak flow capacity of 788 mgd from the three remote headworks.

A fourth headworks facility, the Winthrop Terminal, is located on Deer Island and receives flows from the city of Winthrop and the East Boston (Caruso) Pump Station through the North Metro Trunk Sewer. Figure H-1 on the next page shows the North System schematics.

**H.1.a
North System
Pump Stations**

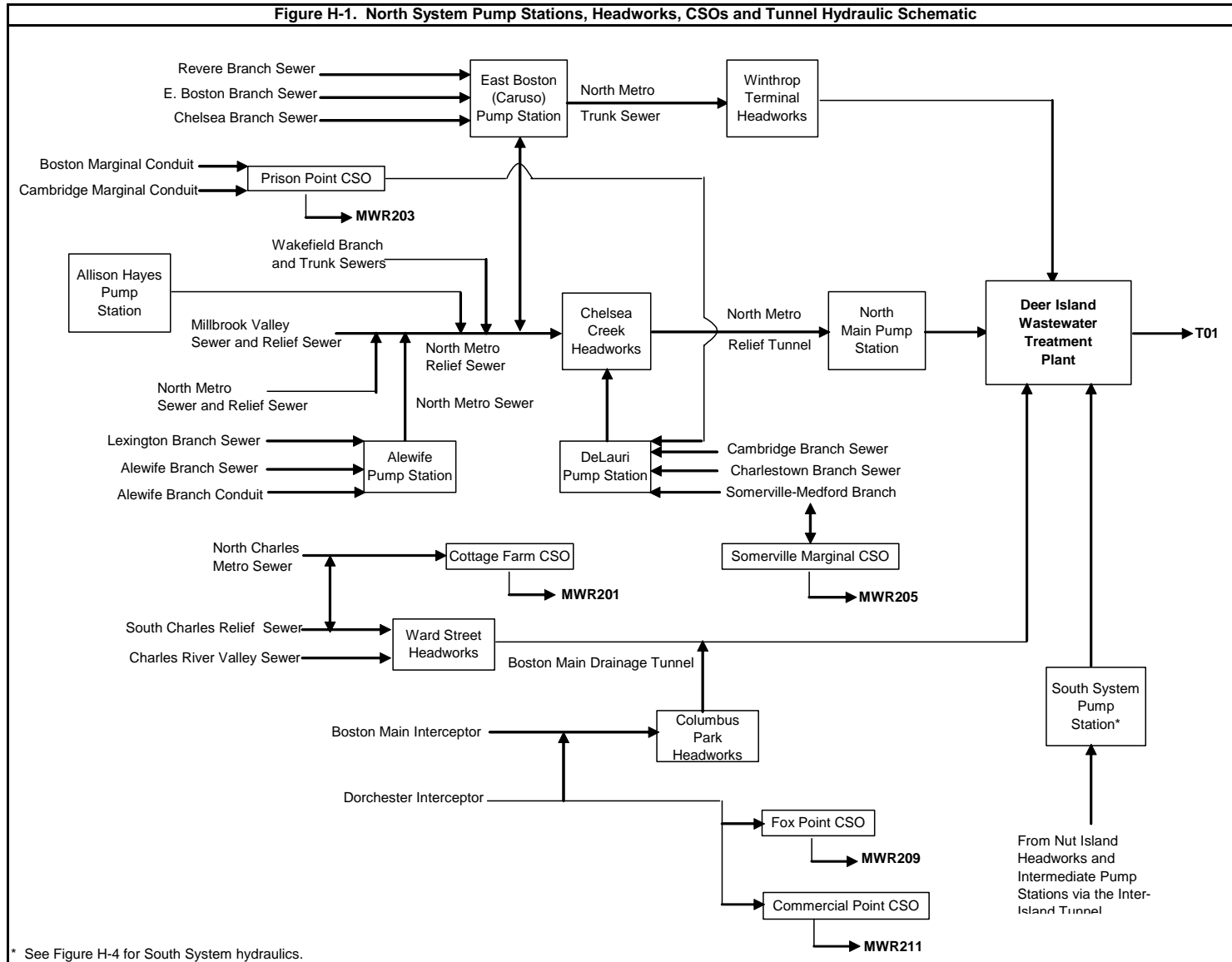
The MWRA North System has four pump stations. The Alewife Brook (64 mgd), Caruso (110 mgd), DeLauri (90 mgd), and Allison Hayes (11 mgd) pump stations convey wastewater to the headworks facilities. The four pump stations receive flow from interceptor lines as follows:

Alewife Brook Pump Station	Lexington Branch Sewer Alewife Branch Sewer Alewife Branch Conduit
Caruso Pump Station	Revere Branch Sewer East Boston Branch Sewer North Metro Relief Sewer*
DeLauri Pump Station	Cambridge Branch Sewer Charlestown Branch Sewer Medford-Somerville Branch Sewer Prison Point Pump Station Somerville Marginal CSO Overflow**
Allison Hayes Pump Station	Wakefield Branch Sewer

*: When flow to the Chelsea Creek Headworks is held back, wastewater is diverted to the Caruso Pump Station.

** : During low-intensity rainfall when line capacity is not exceeded, the combined wastewater is pumped back to the trunk sewers and ultimately to the DeLauri station.

Figure H-1. North System Pump Stations, Headworks, CSOs and Tunnel Hydraulic Schematic



* See Figure H-4 for South System hydraulics.

**H.1.b
North System
Headworks**

The Deer Island Treatment Plant receives North System flow from three remote headworks and the Winthrop Terminal headworks. The three remote headworks: Ward Street Headworks (256 mgd) located in Roxbury, Columbus Park Headworks (182 mgd) in South Boston, and Chelsea Creek Headworks (350 mgd) in Chelsea, have a combined pumping capacity of 788 mgd. The Winthrop Terminal Headworks (125 mgd) is located on Deer Island. The four North System headworks receive flows from interceptor lines or pump stations as follows:

Ward Street Headworks	South Charles Relief Sewer Charles River Valley Sewer North Charles Metro Sewer* Cottage Farm CSO*
Columbus Park Headworks	Boston Main Interceptor Dorchester Interceptor
Chelsea Creek Headworks	Alewife Pump Station North Metro Relief Sewer DeLauri Pump Station Caruso Pump Station Overflow
Winthrop Terminal Headworks	Winthrop Sewer Caruso Pump Station**

*: During low intensity rainfall when line or holding capacity is not exceeded, the combined wastewater is pumped back to the trunk sewers and ultimately to the Ward Street Headworks.

** : Overflow from the Caruso Pump Station.

**H.1.c
Combined
Sewer
Overflow
Facilities**

The conditions for discharge of effluent from six CSO chlorination facilities are also included in MWRA's Boston NPDES permit. One of these facilities, Constitution Beach in East Boston, was closed in September 2000, leaving five active permitted CSO facilities. These five facilities, Cottage Farm and Prison Point in Cambridge, Somerville Marginal in Somerville, and Fox Point and Commercial Point in Dorchester, discharge to the Charles River, the Inner Harbor, the Mystic River, Dorchester Bay and Dorchester Bay, respectively.

Discharge of combined wastewater from a CSO treatment facility outfall to a receiving body of water is defined in this report as a CSO activation. Discharge of combined wastewater to a non-facility CSO outfall pipe is defined as a CSO overflow. CSO overflows will not be discussed in this report. In general, CSO activations occur as a result of heavy rain, snowmelt, or choking at the headworks.

Choking is the process by which the headworks restrict the flow to Deer Island. During wet weather, when the wastewater volume exceeds the hydraulic capacity of the treatment plant, the headworks “choke” the flow and hold the wastewater in the lines. As a result, the combined wastewater backs up into the system, forcing the combined wastewater to overflow to CSO treatment facilities and non-facility CSO outfall pipes, resulting in potential CSO activations and overflow as well as potential SSOs. In addition to choking in response to hydraulic demand on the system, the headworks may choke so that emergency repairs, system testing, or maintenance work can be performed at the treatment plant. Choking at Ward Street and Columbus Park Headworks influences Cottage Farm activations. Choking at the Columbus Park Headworks can influence activations at Fox Point and Commercial Point CSOs. Backups at the DeLauri Pumping Station brought about by choking at the Chelsea Headworks can activate the Somerville Marginal CSO.

At the CSO facilities, the combined wastewater is screened and chlorinated prior to discharge. Of the five CSO facilities, only Cottage Farm and Prison Point have tank storage capacity. This allows the chlorinated wastewater to be held at these facilities. The facility only discharges when the storage capacity is exceeded; when that happens, the treated wastewater overflows and is discharged to the river. The three other CSO facilities are gravity CSO facilities, which mean that combined wastewater arrives and leaves the CSO facility by gravity. This type of facility provides disinfection and allows the chlorinated combined wastewater to overflow to the receiving water as quickly as the wastewater arrives at the facility.

The five CSO facilities provide treatment for approximately 50% of the CSO volume while the other half overflows in any of 80-plus permitted CSO overflow structures of the sewerage system without the benefit of any type of treatment. Of the more than 80 permitted CSO overflow structures, 53 are located in Boston, 15 in Cambridge, 5 in Chelsea, and 12 in Somerville. These outfalls discharge into Boston Harbor, the Alewife Brook, the Mystic River, the Charles River, and the Neponset River.

Cottage Farm CSO Facility

During dry weather conditions, wastewater arrives at the Ward Street Headworks where it is pumped to the Deer Island Plant. Under storm conditions, wastewater backs up into sewer lines and into the Cottage Farm CSO facility. Cottage Farm detains wastewater up to a volume of 1.3 MG. Any excess flow is screened, settled, chlorinated, and discharged to the Charles River through outfall MWR201. Combined wastewater that is held back is pumped back to the Ward Street Headworks. This facility, on-line since 1971, has a design pumping capacity of 233 mgd. An upgrade completed in FY01 added a dechlorination system for the effluent.

Prison Point CSO Facility

Prison Point is both a dry weather and storm water pumping station. The dry weather phase is a five-mgd capacity sewer pumping station that receives flow from the Boston Marginal Conduit and the Cambridge Marginal Conduit. Prison Point feeds into the DeLauri Pumping Station.

The storm water phase has a maximum pumping capacity of 385 mgd. Treatment includes screening, disinfection, and detention. During wet weather, if the dry pumping capacity is exceeded, the combined flow is screened, chlorinated, and held in detention basins. Once the basins fill, treated flow is discharged downstream below the Charles River Dam at outfall MWR203. Combined wastewater volume that is held back, up to 1.2 MG, is pumped back to the DeLauri Station. This facility came on-line in 1980 and was upgraded with a dechlorination system in 2001.

Somerville Marginal CSO Facility

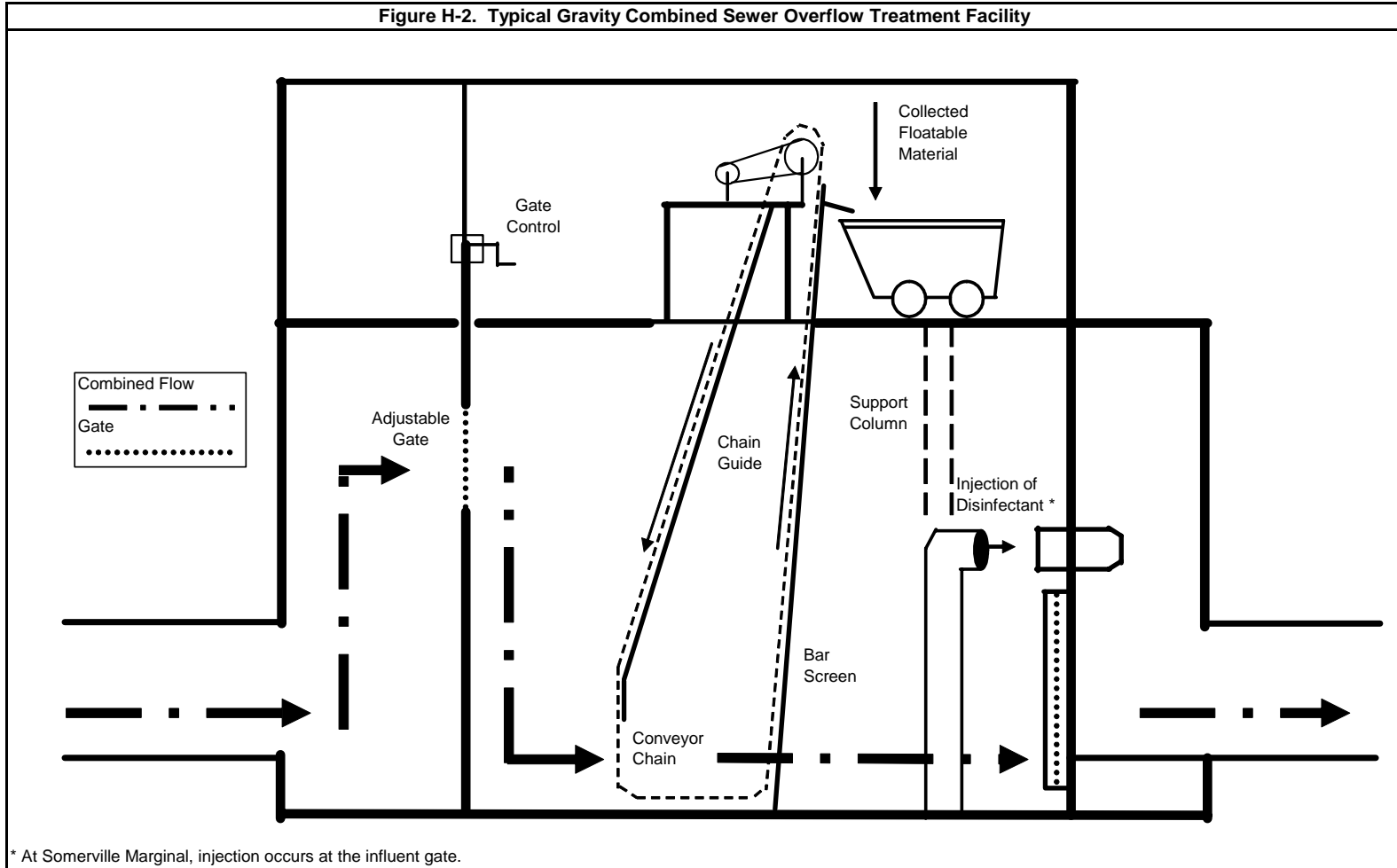
Somerville Marginal CSO is an unmanned gravity facility with a design capacity of 245 mgd. It receives wet weather flow from the northeast portion of Somerville and part of Medford. Normally, dry weather flow from these areas arrives at the DeLauri Station via the Somerville-Medford trunk sewers. During wet weather, combined sewer flow backs up to the Somerville CSO facility. Unlike Cottage Farm or Prison Point, this facility does not provide any large-scale detention capacity during storm conditions. Treatment consists of screening and chlorination. Effluent is discharged to the lower Mystic River basin at outfall numbers MWR205. The relief outfall, MWR205A, discharges to freshwater above the dam. MWR205A only activates under specific conditions and the vast majority of discharges are released through MWR205. During low-intensity rainfall when line capacity is not exceeded, the combined wastewater is pumped back from a wet well to the DeLauri Station. This facility came on-line in 1973 and was upgraded in 2001 with a dechlorination system.

Figure H-2 on the following page shows a representative gravity CSO schematic applicable to Somerville Marginal as well as the Fox Point and Commercial Point facilities.

Fox Point CSO Facility

Fox Point is an unmanned gravity facility with a design capacity of 119 mgd. It receives wet weather flows from the Dorchester Interceptor sewer line. Operation of this facility parallels that of the Somerville Marginal CSO; treatment includes screening and disinfection. Effluent is discharged to Dorchester Bay through outfall number MWR209. This facility came on-line in 1989, and a dechlorination system was added in 2001.

Figure H-2. Typical Gravity Combined Sewer Overflow Treatment Facility



Commercial Point CSO Facility

Commercial Point is an unmanned gravity CSO with a design capacity of 194 mgd. This facility also receives wet weather backups from the Dorchester Interceptor. Treatment includes screening and disinfection. Effluent is discharged to Dorchester Bay through outfall number MWR211. This facility came on-line in 1991 and was upgraded in 2001 with a dechlorination system.

H.2 South System

The South System serves a population of about 700,000 people and is located to the south and southwest of Boston. The South System covers an area of approximately 237 square miles. Figure H-3 on the following page illustrates the South System hydraulic schematic. Community sewer lines tie into the South System through MWRA interceptor lines. The Framingham Extension Sewer, Wellesley Extension Sewer, Upper Neponset Valley Sewer, Wellesley Extension Relief Sewer, Neponset Valley Sewer, Walpole Extension Sewer, Stoughton Extension Sewer, Braintree-Randolph Trunk Sewer, and several other branch sewers discharge to the South System High Level Sewer. The High Level Sewer has a capacity of 360 mgd. Pump stations move the wastewater through the High Level Sewer to the Nut Island Headworks for preliminary treatment and grit removal. The South System flows are then conveyed to the South System Pump Station at Deer Island through the 4.7-mile Inter-Island Tunnel for treatment at the Deer Island Treatment Plant.

In 2004 the MWRA completed the Braintree-Weymouth Intermediate Pump Station (IPS) in North Weymouth. The IPS pumps sewage from the North Weymouth Relief Interceptor directly into the Inter-Island Tunnel, bypassing Nut Island. The IPS also acts as a headworks with bar screens and grit collectors. The IPS was designed to increase South System capacity, helping to alleviate some of the overflows in the South System. Additionally, the IPS will pump by-products between the fertilizer pelletizing plant in Quincy and Deer Island. Sewage sludge will flow from Deer Island to Quincy for conversion to fertilizer and centrate from the fertilizer production process will return to Deer Island via the IPS and Inter-Island Tunnel.

Once at Deer Island, the South System flow can be pumped to one of two locations. The South System flow is normally discharged to the effluent channel of the Grit Facility, where it is combined with the North System and recycle flows, then split between Primary Clarifier Batteries A through D. The alternate discharge location is directly to the Primary Clarifier Battery D influent channel, which allows the South System flow to be isolated.

**H.2.a
South System
Pump Stations**

Eight MWRA pump stations move wastewater from low-lying areas to the High Level Sewer: Hingham Pump Station (16.5 mgd), Braintree-Weymouth Pump Station (60 mgd), Braintree-Weymouth IPS (45 mgd), Squantum Pump Station (12 mgd), Houghs Neck Lift Station (2.8 mgd), Neponset Pump Station (90 mgd), Framingham Pump Station (48 mgd) and Quincy Pump Station (52 mgd).

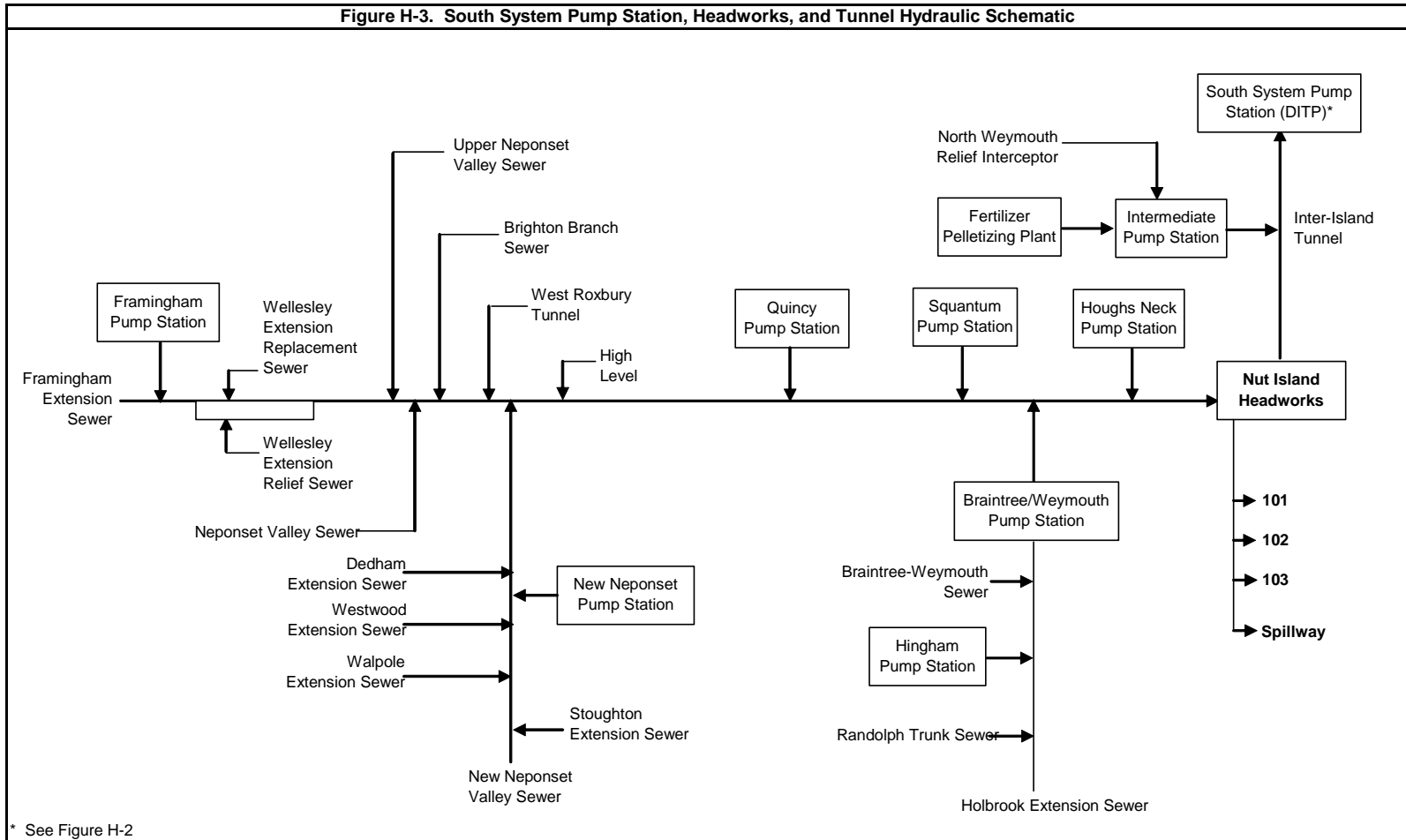
The seven pumping stations receive flow from interceptor or community lines as follows:

Hingham Pump Station	Weymouth-Hingham Sewer Lines
Braintree-Weymouth Pump Station	Braintree-Randolph Trunk Sewer
	Braintree-Weymouth Extension Sewer
	Holbrook Extension Sewer
	Hingham Pump Station
Braintree-Weymouth IPS	North Weymouth Relief Interceptor
	Quincy Pelletizing Plant (see Chapter 4)
Squantum Pump Station	Squantum Sewers
Houghs Neck Lift Station	Houghs Neck Sewer
Neponset Pump Station	Neponset Valley Sewer
Framingham Pump Station	Framingham Sewers
Quincy Pump Station	Quincy and Upstream Sewers

**H.2.b
South System
Headworks**

The Deer Island Treatment Plant receives South System flow from the Nut Island Headworks. The Nut Island Headworks went on-line on July 7, 1998. It is located in Quincy and has a capacity of 360 mgd. Vortex grit separators similar to those used on Deer Island in the North System Grit Facility provide grit removal for South System flows.

Figure H-3. South System Pump Station, Headworks, and Tunnel Hydraulic Schematic



H.3 Deer Island Treatment Plant

Until July 8, 1998, wastewater flows from the North System were treated at the Deer Island Treatment Plant and flows from the South System were treated at the Nut Island Treatment Plant. In July 1998, the Nut Island Treatment Plant was decommissioned and all flows were treated at Deer Island.

Four lines convey sewage to the Deer Island Treatment Plant. North System wastewater is delivered to the plant via the Boston Main Drainage Tunnel (from the Ward Street and Columbus Park Headworks), the North Metropolitan Relief Tunnel (from the Chelsea Creek Headworks), and the North Metropolitan Trunk Sewer. South System wastewater is transferred to the plant from the Nut Island Headworks and Braintree-Weymouth Intermediate Pump Station via the Inter-Island Tunnel.

The Deer Island Treatment Plant receives wastewater at the North Main Pump Station (NMPS), the Winthrop Terminal, and the South System Pump Station (SSPS). The North Metro Relief Tunnel and the Boston Main Drainage Tunnel connect to the NMPS, which consists of ten pumps, each rated at 110 mgd, for a total pumping capacity of 1,100 mgd. The North Metro Trunk Sewer connects to the Winthrop Terminal. The Inter-Island Tunnel connects to the SSPS, which consists of eight pumps, each rated at 66.7 mgd, for a total capacity of 534 mgd.

Grit removal and screening (preliminary treatment), which remove heavy particles and debris, is provided at the remote headworks and on-site at Deer Island. Flow from the South System receives preliminary treatment at the Nut Island Headworks. Grit and screenings are landfilled off-site.

The upgraded primary treatment plant came on-line on January 21, 1995. The first battery of secondary treatment was initiated at Deer Island on August 1, 1997. Battery B came on-line on March 1, 1998, and the third and final secondary treatment battery, Battery C, started up on March 8, 2001.

Wastewater from the North System flows through the grit chambers for additional grit removal. It, along with South System wastewater, then flows to the primary settling tanks where floatables, consisting mainly of oil, grease, and plastics rise to the surface while the sludge of heavy solid particles settles to the bottom. The majority of the primary effluent (the allowable capacity for secondary treatment) is sent to secondary treatment, while any remaining portion from high flow conditions due to rainfall bypasses secondary and is sent directly to the disinfection basins to be treated with sodium hypochlorite. Effluent from secondary treatment is then, if necessary, blended with primary effluent that bypassed secondary, and then sent to the disinfection basins, where it is chlorinated, detained, and then dechlorinated before discharge.

The scum (floatables) is skimmed off the top of the primary and secondary settling tanks while the sludge (settled solids) is scraped from the bottom of the tanks. Primary scum is pumped to the scum concentrator while the primary sludge is pumped to the gravity sludge thickeners. Scum and sludge from the secondary batteries are concentrated using centrifuges. After the scum and sludge are concentrated and thickened, they are conveyed to the anaerobic digesters for further treatment. The digested sludge/scum is sent via the Inter-

Island Tunnel to the Fore River Pelletizing Plant, where it is converted into fertilizer (refer to Chapter IV). Methane from the digestion process is stored and used to generate power and heat for DITP.

Figure H-4 on the following page presents the Deer Island plant process flow diagram.

**H.3.a
Deer Island
Treatment
Plant Outfalls**

On September 6, 2000, effluent from Deer Island was diverted to the new 9.5 mile outfall tunnel into Massachusetts Bay. Effluent is discharged through 53 operational risers over the last 1.25 miles of the tunnel. The tunnel has a capacity of 1,270 mgd, slightly greater than the old harbor outfall system. Before the effluent enters the outfall it is used to run a hydroelectric facility linked to the Deer Island power grid. Although sealed and non-operational, the old Deer Island harbor outfalls are subject to periodic inspections and remain available for emergency use. Effluent is channeled through a common conduit to four potential outfall pipes: 001, 002, 004, and 005

**H.3.b
Nut Island
Outfalls**

The former Nut Island Treatment Plant discharged treated wastewater through four outfalls. Although the Nut Island Treatment Plant no longer exists, outfalls 101, 102 and 103 remain operational in case of emergency at the Nut Island Headworks. These outfalls discharge to Boston Harbor; the new emergency spillway built concurrently with the new headworks discharges to Hingham Bay.

**H.4
Collection and
Transport
System**

An issue of concern in both the North System and the South System is the occurrence of Sanitary Sewer Overflows (SSOs). These occur during extreme rainfall events, when inflow and infiltration from heavy rains exceeds the capacity of the pipes, causing certain areas to become inundated. Whenever there is a high amount of rainfall, a crew from the Transport Department investigates a number of critical areas to visually monitor potential overflow sites. While some of these critical areas are the MWRA's responsibility, most of them are the responsibility of the local communities. A list of these areas belonging to the MWRA is included in Table H-4 on page H-15. Not all of these areas are checked during every rainfall, and some are monitored by the MWRA only during extreme storm events. Table H-5 shows areas identified by MWRA staff as having the potential to overflow under certain conditions. SSOs have not, as of yet, occurred in these areas.

Figure H-4. Deer Island Treatment Plant Process Flow

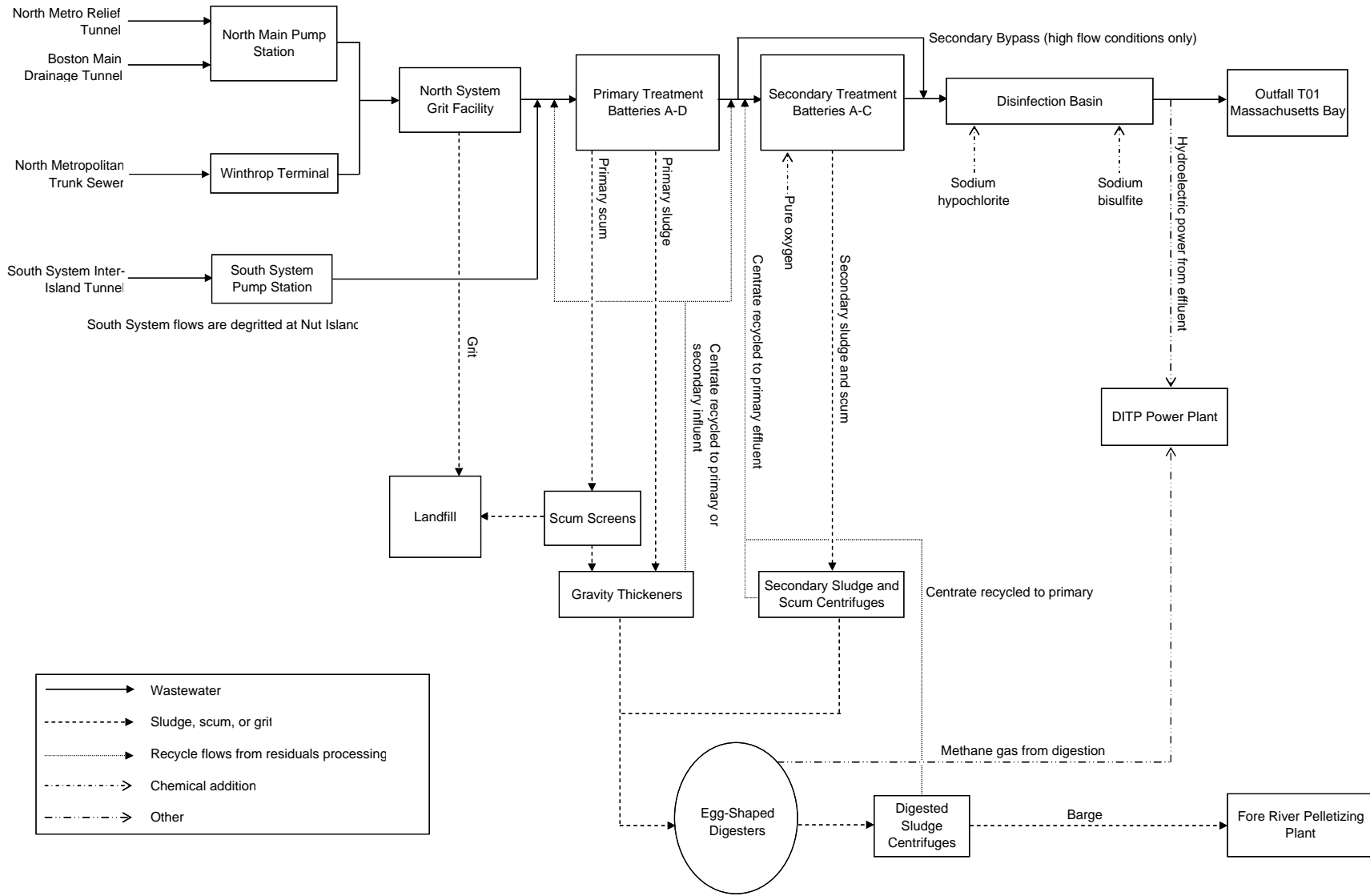


Table H-4. Known MWRA Sanitary Sewer Overflow Locations*		
System	Location	Description
North	Arlington, Section 80 (Station 3+89)	Dudley St., manual plug
	Arlington, Section 80 (Station 19+73)	Brattle Court, manual plug
	Arlington, Section 152 (Station 56+54)	Manhole on Mystic Valley Pkwy., west easement
	Malden, Section 20A (Station 15+22)	20 Pearl St., Edgeworth Branch upstream manhole
	Medford, Section 19 (Station 4+25)	Malden River siphon, upstream headhouse
	Medford, Section 107 (Station 1+00)	Overflow weir, Mystic River Pkwy., near James St.
	Medford, Section 152 (Station 31+24)	Section 91B: downstream headhouse off Lakeview Rd.
	Melrose, Section 51 (Station 10+75)	Brunswick Park, Roosevelt School
	Melrose, Section 60 (Station 15+91)	Tremont St. @ Ell Pond, west side
	Somerville, Section 155 (Station 9+12)	Section 43.5: Boston Ave. (upstream headhouse)
	Somerville, Section 176A (Station 131+21)	Section C: manhole weir, Auburn St. between curb and Mystic River
	Somerville, Section 176C (Station 0+35)	Alewife Brook pump station
	Stoneham, Section 42 (Station 30+50)	Manhole on West Wyoming Ave. @ town boundary
	Waltham, Section 212 (Station 401+78)	Old Section 4A: Elm St. @ Charles River
	Winchester, Section 45 (Station 35+00)	Manhole off Cross St.
	Winchester, Section 113B (Station 2+06)	Wedgemere siphon, downstream headhouse @ T station
	Winchester, Section 113B (Station 3+24)	Wedgemere siphon, upstream headhouse @ Bacon St.
South	Boston/Roslindale, Section 570 (Station 10+89)	High Level Sewer: overflow relief structure @ Bradeen St., north gates
	Boston/Roslindale, Section 570 (Station 10+89)	High Level Sewer: overflow relief structure @ Bradeen St., south gates
	Boston/Roslindale, Section 571 (Station 13+51)	High Lever Sewer @ Arboretum, South St.
	Braintree, Section 626 (Station 54+06)	Smelt Brook siphon, upstream headhouse
	Braintree, Section 628 (Station 13+73)	Pearl St. siphon, new manhole with gate
	Braintree, Section 628 (Station 16+30)	Pearl St. siphon, pump out manhole
	Braintree, Section 628 (Station 17+07)	Pearl St. siphon, downstream headhouse
	Braintree, Section 628 (Station 17+64)	Pearl St. siphon, upstream headhouse
	Braintree, Section 655 (Station 84+28)	Randolph Trunk siphon, downstream headhouse
	Newton, Section 530 (Station 52+13)	Upper Neponset Valley Sewer @ Vine and Hollywood Sts.
	Quincy, Section 543B (Station 3+15)	Nut Island Headworks emergency outfall: gates 17//18
	Quincy, Section 680 (Station 0+40)	Nut Island Headworks emergency spillway
	Randolph, Section 655 (Station 85+14)	Randolph Trunk siphon (upstream headhouse)

* Known SSOs occurring in MWRA lines from January 1, 1996 onwards.

Table H-5. Potential MWRA Sanitary Sewer Overflow Locations		
System	Location	Description
South	Boston, Section 564	High Level Sewer, Neponset River at Monponset St.
	Canton, Section 614	New Neponset Valley Relief Sewer Pump Station
	Hingham, Section 562	Hingham Pump Station
	Quincy, Section 543	Nut Island emergency outfall
	Quincy, Section 543	Nut Island emergency spillway
	Quincy, Section 551B	Quincy Pump Station
	Quincy, Section 621	Braintree-Weymouth Pump Station influent
	Squantum, Section 550B	Squantum Pump Station
	West Roxbury, Section 637A	West Roxbury Tunnel and High Level Sewer junction
	West Roxbury, Section 637A	West Roxbury Tunnel and High Level Sewer junction

Appendix I: Instrument Detection Limits, Method Detection Limits, and Quantitation Limits

Overview	<p>An understanding of the detection limits of analysis is essential to reviewing the data from chemical analyses. There are three different types of detection limits that are most often encountered:</p> <ul style="list-style-type: none">• Instrument Detection Limits• Method Detection Limits• Quantitation Limits, also known as Reporting Limits.
I.1 Instrument Detection Limits	<p>Instrument detection limits (IDL) reflect the capability of the instrument. This limit will be the lowest of the three detection limits. The IDL will not take into account the losses of the pollutant associated with the matrix (soil or wastewater) and extraction procedure. This discrepancy is known as matrix interference.</p>
I.2 Method Detection Limits	<p>Method detection limits (MDL) are the smallest amount of a substance that can be detected above background noise using a particular method. The MDL is statistically determined by running a series of analyses using various low concentrations of a pollutant. Using a Student's "T" test, the smallest concentration that has a 99% probability of being detected above the background is designated the MDL for that pollutant. The EPA, using several private laboratories, has determined what the MDLs are for most priority pollutants using their approved methods. These are published in the 40 CFR.</p>
I.3 Quantitation Limits	<p>In general, if a plot is made of pollutant concentration versus instrument response, it will show a linear relationship. As the pollutant concentration approaches zero, the linearity of the relationship is lost. The point where the linearity is lost is called the Quantitation Limit (QL) or sometimes the Reporting Limit. In other words, the smallest concentration where the linear relationship holds is the smallest concentration that can be quantified. Generally, the QL is about five times the MDL. Quantitative limits are relevant to GC/MS analyses, that is, methods 608 (for pesticides), 624 (for volatile organics), and 625 (for semi-volatile organics). Specific limits are highly matrix-dependent.</p>
I.4 Detection Limits, Non-Detects, and Reporting	<p>In short, the IDL is the lowest concentration that a particular instrument can detect. The MDL is the lowest concentration that can be detected using a particular method. The QL is the smallest concentration that can be confidently considered to be accurate.</p> <p>Reported concentrations that are between the MDL and the QL indicate that a pollutant is present, but at a concentration too low to be accurately quantified. For example, using EPA method 624, chloroform has an MDL of 1.6 µg/L and a QL of 10 µg/L. If the concentration from an analysis is reported as 5 µg/L then it can be inferred that although the actual chloroform concentration in the</p>

wastewater is uncertain, 5 µg/L is a best guess. The EPA requires that these intermediate values be flagged with a “J” on any reports submitted to them. Therefore, these are sometimes simply called “J-values.”

For non-detects in analyses of metals, cyanide, petroleum hydrocarbons, etc., it is customary for “less than the MDL” to be listed as a result. For a non-detect in the 608, 624, and 625 analyses, “less than the QL” is typically listed.

Often it becomes necessary to estimate a concentration for below detection limit values, specifically when calculating the average yearly concentration of a pollutant. A well-established method is to assume the actual concentration of a non-detected pollutant is simply one half of the MDL. While no scientific theory supports this assumption, it is more reasonable than assuming that the concentration is zero, or the MDL itself. The EPA and DEP also accept it as a standard practice that can be applied to any series of tests.

This technique is utilized in this report. For the organic compounds – methods 608, 624, and 625 – one tenth of the QL, or half the MDL, was assumed for all non-detects (i.e. values below QL). For all metals, cyanide, petroleum hydrocarbons, etc., half the MDL was assumed for all non-detects (i.e. values below MDL).

In Table I-1 is a list of the parameters regularly tested for in MWRA effluent. The required EPA method number, and the MDLs and reporting limits attained by the MWRA’s Central Laboratory are included.

Table I-1. List of Parameters Tested			
Parameter	EPA Method Number	MWRA MDL (µg/L)	MWRA QL (µg/L)
Metals			
Aluminum	200.7	90	<90
Antimony	200.7	0.8	<0.9
Arsenic	206.2	0.8	<0.8
	200.7	43.8	<45
Beryllium	200.7	0.3	<0.5
Boron	200.7	9.5	<250
Cadmium	200.7	1.1	<2
	213.2	.03	<0.03
Chromium	200.7	4.0	<4
	218.2	0.7	<0.7
Copper	200.7	10.5	<10
	220.2	0.6	<1
	200.8	†	†
Hexavalent Chromium	SM 3500-CR D ²	1.8	<5
Iron	200.7	3	<30
Lead	200.7	12.0	<15
	239.2	2.4	<2.4
Mercury	245.2	0.01	<0.01
	1631	†	†
Molybdenum	200.7	3.4	<5
	246.2	1.2	<1
Nickel	200.7	3.0	<3
	249.2	0.7	<0.7
Selenium	200.7	48.2	<50
	270.2	0.9	<0.9
Silver	200.7	1.4	<2
	272.2	0.09	<0.09
Thallium	200.7	58.3	<60
	279.2	1.0	<1
Zinc	200.7	5.7	<6
Other Inorganic Chemicals⁴			
Cyanide	335.2	0.004	<0.01
Fats, Oil, and Grease (mg/L)	1664A	2.0	<7
Petroleum hydrocarbons (mg/L)		†	†
Phenol (mg/L)	420.2 MO	0.003	<0.01
Sulfate (mg/L)	300.0	0.2	<1
Total Organic Carbon (mg/L)	415.1	0.06	<0.3
Surfactants (mg/L)	425.1	0.03	<0.03
Pesticides (ng/L)			
4,4'-DDD	608	6.8	<20
4-4'-DDE	608	8.8	<20
4-4'-DDT	608	15.8	<20
Aldrin	608	3.5	<20
alpha-BHC	608	6.3	<20
alpha-Chlordane	608	3.6	<20
beta-BHC	608	6.3	<20
Chlordane (Technical)	608	†	†
delta-BHC	608	6.7	<20
Dieldrin	608	5.5	<20
Endosulfan I	608	5.3	<20
Endosulfan II	608	4.0	<20
Endosulfan sulfate	608	16.7	<20
Endrin	608	13.7	<20
Endrin aldehyde	608	9.1	<20
Endrin ketone	608	5.4	<20
gamma-BHC (Lindane)	608	4.2	<20
Heptachlor	608	9.7	<20
Heptachlor epoxide	608	8.8	<20
Hexachlorobenzene	612	†	†
Methoxychlor	608	52.0	<200
Toxaphene	608	†	†

Table I-1. List of Parameters Tested (cont.)			
PCBs (all in ng/L)			
Arochlor-1016	608	31.0	<500
Arochlor-1221	608	21.0	<1000
Arochlor-1232	608	14.0	<500
Arochlor-1242	608	1	1
Arochlor-1248	608	1	1
Arochlor-1254	608	10.0	<500
Arochlor-1260	608	32.0	<500
Volatile Organics			
1,1,1-trichloroethane	624	1.0	<5
1,1,2,2-tetrachloroethane	624	1.3	<5
1,1,2-trichloroethane	624	0.6	<5
1,1-dichloroethane	624	0.8	<5
1,1-dichloroethene	624	1.3	<5
1,2-dichlorobenzene	624	0.4	<5
1,2-dichloroethane	624	0.6	<5
1,2-dichloropropane	624	0.4	<5
1,3-dichlorobenzene	624	0.5	<5
1,4-dichlorobenzene	624	0.4	<5
2-butanone	624	1.8	<5
2-chloroethylvinylether	624	0.8	<5
2-hexanone	624	1.5	<5
4-methyl-2-pentanone	624	1.3	<5
Acetone	624	16	<5
Acrolein	624	5.4	<5
Acrylonitrile	624	4.2	<5
Benzene	624	0.5	<5
Bromodichloromethane	624	0.4	<5
Bromoform	624	0.4	<5
Bromomethane	624	1.1	<5
Carbon disulfide	624	1.4	<5
Carbon tetrachloride	624	1.0	<5
Chlorobenzene	624	0.4	<5
Chloroethane	624	1.0	<5
Chloroform	624	0.5	<5
Chloromethane	624	0.7	<5
cis-1,2-dichloroethene	624	0.5	<5
cis-1,3-dichloropropane	624	0.3	<5
Dibromochloromethane	624	0.6	<5
Ethylbenzene	624	0.5	<5
m,p-xylene	624	1.4	<5
Methylene chloride	624	0.6	<5
o-xylene	624	0.5	<5
Styrene	624	0.4	<5
Tetrachloroethene	624	0.8	<5
Toluene	624	0.5	<5
trans-1,2-dichloroethene	624	1.1	<5
trans-1,3-dichloropropene	624	0.3	<5
Trichloroethene	624	1.0	<5
Trichlorofluoromethane	624	0.8	<5
Vinyl acetate	624	0.8	<5
Vinyl chloride	624	1.0	<5
Semi-Volatiles			
1,2,4-trichlorobenzene	625	6.1	<10
1,2-dichlorobenzene	625	3.7	<10
1,2-diphenylhydrazine	625	8.7	<10
1,3-dichlorobenzene	625	2.9	<10
1,4-dichlorobenzene	625	3.2	<10
2,2'-oxybis(1-chloropropane)	625	3.9	<10
2,4,5-trichlorophenol	625	8.4	<10
2,4,6-trichlorophenol	625	9.6	<10
2,4-dichlorophenol	625	9.0	<10
2,4-dimethylphenol	625	8.1	<10
2,4-dinitrophenol	625	12.4	<20

Table I-1. List of Parameters Tested (cont.)			
Semi-Volatiles (cont.)			
2,4-dinitrotoluene	625	7.6	<10
2,6-dinitrotoluene	625	10.0	<10
2-chloronaphthalene	625	9.2	<10
2-chlorophenol	625	4.2	<10
2-methyl-4,6-dinitrophenol	625	7.9	<100
2-methylnaphthalene	625	4.5	<10
2-methylphenol	625	7.5	<10
2-nitroaniline	625	6.9	<10
2-nitrophenol	625	6.2	<10
3-3'-dichlorobenzidine	625	8.4	<20
3-nitroaniline	625	8.6	<10
4-bromophenyl phenyl ether	625	7.8	<10
4-chloro-3-methylphenol	625	7.4	<10
4-chloroaniline	625	8.2	<10
4-chlorophenyl phenyl ether	625	9.0	<10
4-methylphenol (includes 3-methylphenol)	625	7.2	<10
4-nitroaniline	625	8.0	<10
4-nitrophenol	625	6.3	<20
Acenaphthene	625	6.8	<10
Acenaphthylene	625	7.2	<10
Aniline	625	6.6	<10
Anthracene	625	5.8	<10
Benzindine	625	0.5	<10
Benzo(a)anthracene	625	5.4	<10
Benzo(a)pyrene	625	5.4	<10
Benzo(b)fluoranthene	625	7.8	<10
Benzo(ghi)perylene	625	5.2	<10
Benzo(k)fluoranthene	625	4.1	<10
Benzoic acid	625	7.2	<20
Benzyl alcohol	625	5.8	<10
bis(2-chloroethoxy) methane	625	6.7	<10
bis(2-chloroethyl) ether	625	4.1	<10
bis(2-ethylhexyl) phthalate	625	4.9	<10
Butyl benzyl phthalate	625	6.6	<10
Chrysene	625	6.2	<10
di-n-butylphthalate	625	5.4	<10
di-n-octylphthalate	625	4.6	<10
Dibenzo(a,h)anthracene	625	5.2	<10
Dibenzofuran	625	6.8	<10
Diethyl phthalate	625	9.1	<10
Dimethyl phthalate	625	9.9	<10
Fluoranthene	625	5.1	<10
Fluorene	625	8.1	<10
Hexachlorobenzene	625	8.8	<10
Hexachlorobutadiene	625	6.2	<10
Hexachlorocyclopentadiene	625	10.7	<50
Hexachloroethane	625	3.5	<10
Indeno(1,2,3-cd) pyrene	625	6.4	<10
Isophrone	625	7.5	<10
n-nitroso-di-n-propylamine	625	3.1	<10
n-nitrosodimethylamine	625	4.3	<10
n-nitrosodiphenylamine	625	7.9	<10
Naphthalene	625	5.7	<10
Nitrobenzene	625	6.3	<10
Pentachlorophenol	625	6.9	<30
Phenanthrene	625	5.8	<1
Phenol	625	2.2	<20
Pyrene	625	6.0	<10
¹ Data unavailable. ² Standard Methods. ³ Native concentration too high for MDL determination. ⁴ Some expressed in mg/L as noted.			

Appendix J: Priority Pollutants List and Other Parameters

Table J-1. EPA List of 126 Priority Pollutants		
<p><u>Chlorinated Benzenes</u> Chlorobenzene 1,2-dichlorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene 1,2,4-trichlorobenzene Hexachlorobenzene</p>	<p><u>Chlorinated Ethanes</u> Chloroethane 1,1-dichloroethane 1,2-dichloroethane 1,1,1-trichloroethane 1,1,2,2-tetrachloroethane Hexachloroethane</p>	<p><u>Chlorinated Phenols</u> 2-chlorophenol 2,4-dichlorophenol 2,4,6-trichlorophenol Parametachlorocresol (4-chloro-3-methyl phenol)</p>
<p><u>DDT and Metabolites</u> 4,4-DDT 4,4-DDE (p,p-DDX) 4,4-DDD (p,p-DDE)</p>	<p><u>Haloethers</u> 4-chlorophenyl phenyl ether 2-bromophenyl phenyl ether Bis(2-chloroisopropyl) ether</p>	<p><u>Halomethanes</u> Methylene chloride (dichloromethane) Methyl chloride (chloromethane) Methyl bromide (bromomethane) Bromoform (tribromomethane) Dichlorobromomethane Chlorodibromomethane</p>
<p><u>Inorganics</u> Antimony Arsenic Asbestos Beryllium Cadmium Chromium (III) Chromium (VI) Copper Cyanide, total Lead Mercury Nickel Selenium Silver Thallium Zinc</p>	<p><u>Nitroamines</u> N-nitrosodimethylamine N-nitrosodiphenylamine N-nitrosodi-n-propylamine</p>	<p><u>Pesticides and Metabolites</u> Aldrin Dieldrin Chlordane (technical mixture and metabolites) Alpha-endosulfan Beta-endosulfan Endosulfan sulfate Endrin Endrin aldehyde Heptachlor Heptachlor epoxide (BHC-hexachlorocyclohexane) Alpha-BHC Beta-BHC Gamma-BHC (Lindane) Delta-BHC Toxaphene</p>
<p><u>Phenols (other than chlorinated)</u> 2-nitrophenol 4-nitrophenol 2,4-dinitrophenol 4,6-dinitro-o-cresol (4,6-dinitro-2-methylphenol) Pentachlorophenol Phenol 2,4-dimethylphenol</p>	<p><u>Phthalate Esters</u> Bis(2-ethylhexyl)phthalate Butyl benzyl phthalate Di-n-butyl phthalate Di-n-octyl phthalate Diethyl phthalate Dimethyl phthalate</p>	<p><u>Polychlorinated Biphenyls (PCBs)</u> PCB-1242 (Aroclor 1242) PCB-1254 (Aroclor 1254) PCB-1221 (Aroclor 1221) PCB-1232 (Aroclor 1232) PCB-1248 (Aroclor 1248) PCB-1260 (Aroclor 1260) PCB-1016 (Aroclor 1016)</p>
<p><u>Polynuclear Aromatic Hydrocarbons (PAHs)</u> Acenaphthene 1,2-benzanthracene (benzo(a)anthracene) Benzo(a)pyrene (3,4-benzo-pyrene) 3,4-benzofluoranthene (benzo(b)fluoranthene) 11,12-benzofluoranthene (benzo(k)fluoranthene) Chrysene Acenaphthylene Anthracene 1,12-benzoperylene (benzo(ghi)perylene) Fluorene Fluoranthene Phenanthrene 1,2,5,6-dibenzanthracene (dibenzo(a,h)anthracene) Indeno (1,2,3-cd) pyrene (2,3-o-phenylene pyrene) Pyrene</p>	<p><u>Other Chlorinated Organics</u> Chloroform (trichloromethane) Carbon tetrachloride (tetrachloromethane) Bis(2-chloroethoxy)methane Bis(2-chloroethyl)ether 2-chloroethyl vinyl ether (mixed) 2-chloronaphthalene 3,3'-dichlorobenzidine 1,1-dichloroethylene 1,2-trans-dichloroethylene 1,2-dichloropropane 1,2-dichloropropylene (1,3-dichloropropene) Tetrachloroethylene Trichloroethylene Vinyl chloride (chloroethylene) Hexachlorobutadiene Hexachlorocyclopentadiene 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)</p>	<p><u>Other Organics</u> Acrolein Acrylonitrile Benzene Benzidine 2,4-dinitrotolulene 2,6-dinitrotolulene Ethylbenzene Isophrone Naphthalene Nitrobenzene Tolulene</p>

**Table J-2. NPDES Permit Application Testing Requirements
40 CFR 122, Appendix D, Tables II and III**

<u>Volatile Organics</u>	<u>Organic Pesticides</u>	<u>Organic Base/Neutrals</u>
acrolein acrylonitrile benzene bromoform carbon tetrachloride chlorobenzene chlorodibromomethane chloroethane 2-chloroethylvinyl ether chloroform dichlorobromomethane 1,1-dichloroethane 1,2-dichloroethane 1,1-dichloroethylene 1,2-dichloropropane 1,3-dichloropropylene ethyl benzene methyl bromide methyl chloride methylene chloride 1,1,2,2-tetrachloroethane tetrachloroethylene toluene 1,2-trans-dichloroethylene 1,1,1-trichloroethane 1,1,2-trichloroethane trichloroethylene vinyl chloride	aldrin alpha-BHC beta-BHC gamma-BHC delta-BHC chlordane 4,4'-DDT 4,4'-DDE 4,4'-DDD dieldrin alpha-endosulfan beta-endosulfan endosulfan sulfate endrin endrin aldehyde heptachlor heptachlor epoxide PCB-1242 PCB-1254 PCB-1221 PCB-1232 PCB-1248 PCB-1260 PCB-1016 toxaphene	acenaphthene acenaphthylene anthracene benzidine benzo(a)anthracene benzo(a)pyrene 3,4-benzofluoranthracene benzo(ghi)perylene benzo(k)fluoranthene bis(2-chloroethoxy)methane bis(2-chloroethyl)ether bis(2-ethylhexyl)phthalate 4-bromophenyl phenyl ether butylbenzyl phthalate 2-chloronaphthalene 4-chlorophenyl phenyl ether chrysene dibenzo(a,h)anthracene 1,2-dichlorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene 3-3'-dichlorobenzidine diethyl phthalate dimethyl phthalate di-n-butyl phthalate 2,4-dinitrotoluene 2,6-dinitrotoluene di-n-octyl phthalate 1,2-diphenylhydrazine fluoranthene fluorene hexachlorobenzene hexachlorobutadiene hexachlorocyclopentadiene hexachloroethane indeno(1,2,3-cd)pyrene isophorone naphthalene nitrobenzene N-nitrosodimethylamine N-nitrosodi-n-propylamine N-nitrosodiphenylamine phenanthrene pyrene 1,2,4-trichlorobenzene
<u>Organic Acids</u> 2-chlorophenol 2,4-dichlorophenol 2,4-dimethylphenol 4,6-dinitro-o-cresol (2-methyl-4,6-dinitrophenol) 2,4-dinitrophenol 2-nitrophenol 4-nitrophenol p-chloro-m-cresol (4-chloro-m-cresol) pentachlorophenol phenol 2,4,6-trichlorophenol	<u>Metals</u> antimony, total arsenic, total beryllium, total cadmium, total chromium, total copper, total lead, total mercury, total nickel, total selenium, total silver, total thallium, total zinc, total cyanide, total phenols, total	<u>Cyanide and Phenols</u> cyanide, total phenol, total

Appendix K: Glossary, Abbreviations/Acronyms, and Units

K.1 Glossary

40 CFR Part 122 - Code of Federal Regulations: Protection of the Environment. Part 122 is Administered Permit Programs: The National Pollutant Discharge Elimination System. (Appendix D of 40 CFR 122 lists the Permit Application Requirements.)

Acid Base Neutrals (ABNs) - A category of organic chemical pollutants also called semi-volatile organics. See Appendix K.

Acute - A stimulus severe enough to rapidly induce an effect; in aquatic toxicity tests, an effect observed in 96 hours or less is typically considered acute. When referring to aquatic toxicology or human health, an acute effect is not always measured in terms of lethality.

Acute Criteria- The maximum concentration of a constituent in water that an organism may be exposed to for a total of one hour, once over three years, without dying.

Acute Static Toxicity Test - Test designed to measure water quality effect on mortality. It measures the effect of the whole effluent sample on an organism. Animals are put in a vial with effluent, and the fatal effects are monitored. To calculate water quality standards, the test is run on sensitive animals. The concentration that shows a 95% mortality rate is then multiplied by two.

Activation - An event when the wastewater flow exceeds the holding capacity of the sewer lines and the hydraulic capacity of the treatment plant, causing a diversion of flow to the CSO facilities.

Aeration - The process of adding air to a liquid (e.g. wastewater).

Aliquot - A measured portion of a sample.

Anaerobic Digester - The structure where organic material is broken down by organisms in the absence of oxygen.

Anoxia - The absence of oxygen.

Average Monthly Discharge Limitation - The highest allowable average of “daily discharge” over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured.

Average Weekly Discharge Limitation - The highest allowable average of “daily discharge” over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Bar Screen - A screen made of bars designed to catch large debris (e.g. rags, wood, shoes) in waterways.

Below Detection Limit/Level (BDL) - Values below the Reporting or Quantitation Limit. For further explanation see Appendix K.

Bioaccumulation - The process in which industrial waste, toxic chemicals, and other pollutants gradually build up in living tissues and organs.

Biochemical - Having to do with a chemical change resulting from the metabolic activities of living organisms.

Biochemical Oxygen Demand (BOD) - The amount of oxygen needed to oxidize inorganic materials and to degrade organic materials by *biochemical reactions* in a certain time at a certain temperature. BOD is used as a measure of organic pollution.

Biomagnification - The process by which the concentration of a compound increases in species occupying successive trophic levels.

BDL - See Below Detection Limit

Bloom - A large mass of algae (microscopic and or macroscopic) in water.

BOD - See Biochemical Oxygen Demand.

Buffering Capacity - Measures the ability of certain water bodies to resist changes in pH from addition of acidic or caustic substances.

CFR- See Code of Federal Regulations

Chemical Oxygen Demand (COD) - The amount of oxygen needed for the *chemical oxidation* of chemicals in water. COD is used to measure the suitability of water for organisms that require oxygen.

Chlorination - The addition of chlorine or chlorine compounds to wastewater. Chlorination is most often done for disinfection purposes.

Choking - A process by which flows that cannot be handled by existing pumps are “choked back” into the sewer system, frequently leading to local overflows.

Chronic - A stimulus that lingers or continues for a relatively long period of time, often one-tenth of the life span or more. Chronic should be considered a relative term depending on the life span of an organism. The measurement of a chronic effect can be reduced growth, reduced reproduction, etc., in addition to lethality.

Chronic Criteria - The maximum concentration of a constituent in water that an organism may be exposed to for a total of four days over three years without showing long term, harmful effects, short of mortality. Chronic criteria involve sublethal effects on, among other things, the growth, reproductivity, and fertility of organisms.

Chronic Reproduction Test - A test designed to measure the chronic effects of wastewater on reproduction and fertility.

Chronic Survival and Growth Test - Test designed to see if any mortality occurs after the chronic criteria have been passed. After the organisms have survived, the size of the animals are measured after seven days and statistically compared to controls.

Clean Water Act (CWA) - Formally referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972. Pub. L. 92-500, as amended by Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117: 33 U.S.C.1251 et seq.

COD - See Chemical Oxygen Demand

Code of Federal Regulations (CFR) - Codification of the general and permanent rules of the federal government. CFR 40 covers environmental protection.

Combined Sewer - A sewer receiving both sanitary wastewater and stormwater runoff.

Combined Sewer Overflow Facility - A place where overflow from combined sewers is screened, settled, and chlorinated before being discharged.

Combined Sewer Overflow Pipe - A pipe that discharges overflow from combined sewers in order to prevent back-ups in the sewerage system.

Composite Sample - A sample consisting of a minimum of eight grab samples collected at equal intervals during a 24-hour period (or lesser period if specified) and combined proportional to flow, or a sample continuously collected proportionally to flow over that same time period.

Conventional Parameters/Pollutants - Those pollutants and constituents that are removed from wastewater by conventional treatment. Generally these constituents are settleable solids, biochemical oxygen demand, total suspended solids, oil and grease, total coliform, fecal coliform, residual chlorine, and chlorides.

Conventional Treatment - Well-known or well-established water or wastewater treatment methods, usually consisting of primary and secondary processes and may include advanced or tertiary treatment.

Criteria - The numerical and or narrative elements of water quality standards.

Critical Dilution - Dilution of the effluent required to meet Water Quality Standards.

CWA - See Clean Water Act.

Daily Discharge - The discharge of a pollutant measured during a calendar day or any 24-hours period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the daily discharge is calculated as the average measurement of the pollutant over the day.

Designated Use - Specified use of a body of water included in state water quality standards.

Digester - A place where organic matter is broken down either with oxygen (aerobically) or without oxygen (anaerobically).

Disinfection - The destruction of pathogens (e.g. fecal coliform bacteria) in a water source or wastewater.

Effluent - The wastewater or other water coming out of a treatment facility or process.

Effluent Limitation - Any restriction imposed by the Director (the person authorized to sign NPDES permits by EPA and/or the State) on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States," the waters of the "contiguous zone," or the ocean.

Eutrophication - The natural process by which a body of water ages. Nutrients stimulate plant growth and lakes, estuaries, and bays evolve into bogs or marshes. Effluents high in nutrients cause excessive plant growth that accelerates eutrophication.

Fecal Coliform - Bacteria found in the wastes of warm-blooded animals. Fecal coliform is used as an indicator that disease causing bacteria and viruses are present. It is a component of Total Coliform.

Floatables - Constituents of wastewater that rise to the surface in the settling process, consisting mainly of oil, grease, and plastics.

Grab Sample - An individual sample collected in a period of less than 15 minutes.

Gravity Facility - A combined sewer overflow facility that receives flows by gravity (descending gradients from source to outfall) and requires no pumping.

Grit - Heavy suspended mineral matter in wastewater like sand and gravel.

Grit Chamber - A detention tank where grit is separated by sedimentation (grit settles to the bottom). The settling is controlled by the velocity of the water.

Headworks - A structure where wastewater is screened out and grit and other solids are trapped before the wastewater is pumped to a treatment facility.

Human Health Criteria - Estimated concentrations or quantities of chemicals that can be expected to occur in the environment in water, sediment, or food and that are not likely to pose a significant risk to the exposed human population. Human health criteria are published under section 304(a) of the CWA and are based on the latest scientific information. This information is updated and issued to the states to serve as guidance for the development of criteria.

Hydrocarbons - Chemical compounds only containing hydrogen and carbon.

Hypochlorite - The chemical used for chlorine disinfection of wastewater (either calcium, sodium, or lithium hypochlorite).

Hypoxia - The state of very low oxygen concentration.

IDL - See Instrument Detection Limit.

I/I - Infiltration and Inflow. See separate entries for each.

Infiltration - Groundwater that enters sewer pipes through cracks.

Inflow - Water that enters sewer pipes through illegal connections and storm water runoff.

Inorganic - Not containing carbon.

Influent - Wastewater or other water going into treatment facility or process.

Instrument Detection Limit (IDL) - The smallest amount of a substance a particular instrument is capable of detecting. See Appendix K for further explanation.

Interceptor - A large sewerage line collecting water from smaller sewerage pipes.

J values - Values between the Method Detection Limit and the Quantitation (or Reporting) Limit. See Appendix J for further explanation.

Lethal Concentration 50% (LC50) - The concentration of effluent in a sample that causes mortality to 50% of the test population at a specific time of observation.

Limiting Nutrient - In a given ecosystem, the limiting nutritional factor that controls the growth of plants or animals. Usually the limiting nutrient for plant growth is nitrogen in the marine environment and phosphorus in the fresh water environment. The limiting nutrient can also be thought of as the specific nutrient that will have the most impact on a receiving body of water (for example, the accelerated eutrophication of fresh water bodies caused by phosphorus in wastewater effluent).

Local Limits - The development of specific limits as part of MWRA's General Pretreatment Program: "The permittee shall develop and enforce specific effluent limits for industrial users, and all other users, as appropriate, pursuant to 40 CFR 403.5."

Lowest Observed Effect Concentration (LOEC) - The lowest concentration of effluent to which organisms are exposed in a life cycle or partial life cycle test which contains an adverse effect (on survival, growth, and reproduction).

Maximum Acceptable Toxicant Concentration (MATC) - The effluent concentration that may be present in a receiving water body without causing significant harm to productivity or other uses. The MATC is determined by the results of chronic tests of either a partial life cycle with sensitive life stages

or a full life cycle of the test organism. The MATC is the geometric mean of the No Observed Effect Concentration and the Lowest Observed Effect Concentration.

Maximum Daily Discharge Limitation - The highest allowable daily discharge.

MBAS - See Methylene Blue Anion Surfactant

MDL - See Method Detection Limit

Metals - A group of priority pollutants. See Appendix K for a complete list.

Method Detection Limit (MDL) - The smallest amount of a substance that can be detected above background noise by following a particular method of analysis. See Appendix K for further explanation.

Methylene Blue Anion Surfactant - A specific type of surfactant. See surfactant.

Mixing Zone - Area where discharged effluent is first diluted. The area is extended to cover the secondary mixing in the ambient water body. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as toxic conditions are prevented.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, and 405 of the Clean Water Act (CWA). The term includes an "approved program."

Nine Minimum Controls - Part of the EPA's CSO Policy. The Nine Minimum Controls are:

- 1) Proper operation and regular maintenance (O&M) programs for the sewer system and combined sewer overflow points
- 2) Maximum use of the collection system for storage
- 3) Review and modification of the pretreatment programs to assure CSO impacts are minimized
- 4) Maximization of flow to the POTW for treatment
- 5) Prohibition of CSO discharges during dry weather
- 6) Control of solid and floatable materials in CSO discharges
- 7) Pollution prevention programs that focus on contaminant reduction activities
- 8) Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts
- 9) Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

Nitrification - The conversion of ammonia and nitrite to nitrate.

No Observed Acute Level (NOAL) - The highest concentration of effluent to which organisms are exposed in a short-term test in which at least 90% of the test organisms survive.

No Observed Effect Concentration (NOEC) - The highest concentration of effluent to which organisms are exposed in a life cycle or partial life cycle test which contains no adverse effects (on growth, survival, and reproduction).

NPDES - See National Pollutant Discharge Elimination System

Nutrient - Any element or compound essential as raw material for organism growth and development. Examples: phosphorus and nitrogen.

Oil and Grease - Fats, oils, and grease from animal and plant derivation. Also called FOGs.

Organic Compounds - Volatiles, Acid Compounds, Base/Neutral, and Pesticides. Organics are listed in 40 CFR Ch. 1 Appendix D under CWA Section 307(a). See Appendix K for a complete list.

Orthophosphorus - A form of phosphorus, included in nutrients.

Outfall - the site of initial discharge

PAH - See Polynuclear Aromatic Hydrocarbon

Pesticides/PCBs - Subdivision of priority pollutants. See Appendix K for a complete list.

Petroleum Hydrocarbon (PHC) - Oil and grease from petroleum derivation.

pH - The negative log of the hydrogen ion concentration used to express acidity (<7) and alkalinity (>7).

PHC - See Petroleum Hydrocarbon.

Pollutant - Dredged soil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemicals wastes, biological materials, radioactive materials, (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 *et seq.*)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.

It does not mean: (a) Sewage from vessels; or (b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed or in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the State in which the well is located, and if the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Polynuclear Aromatic Hydrocarbon (PAH) - A type of semi-volatile organic. Also known as polycyclic aromatic hydrocarbons.

POTW - See Publicly Owned Treatment Work.

Preaeration - The process by which air is added to primary influent to help in the removal of gases, floatation of grease, addition of oxygen, and in the settling or coagulation of wastewater.

Prechlorination - The addition of chlorine to primary influent at or near the beginning of the treatment facility/process.

Primary Settling - The detention of wastewater as part of primary treatment to settle out solids (sludge) and collect floatables (scum).

Primary Treatment - Screening and settling of wastewater.

Priority Pollutants - Refers to some of the chemicals listed in 40 CFR Ch. 1 Appendix D under Section 307(a) of the CWA. There are 65 compounds and families of compounds that are among the most persistent, prevalent, and toxic of chemicals known to man. These 65 compounds or families of compounds have been translated into 126 individual pollutants. See Appendix K, Table K-2 for the complete list.

Priority Pollutant Scan - A series of chemical analyses to identify the presence of priority pollutants.

Publicly Owned Treatment Work (POTW) - Any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of liquid nature that is owned by a "State" or a "municipality." This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Pumping Station - Structures where wastewater from low-lying areas is

pumped.

Quantitation Limit - See Reporting Limit.

Removal Rate - or Percent Removal. Defined as the influent concentration minus the effluent concentration, divided by the influent concentration.

Reporting Limit - The smallest concentration that can be quantified. On a graph of pollutant concentration versus instrument response, the reporting limit is the smallest concentration where the linear relationship holds before starting to curve as the pollutant concentration goes to zero. Also called the Quantitation Limit. See Appendix J for further explanation.

Residuals - Matter left over by treatment processes including screenings, scum, and sludge.

Screening - The process by which sewage from interceptors first goes through headworks where grit and large objects like leaves, sticks, and hygiene products (like tampon applicators and condoms) are screened out.

Screenings - The objects that are collected by the process of screening.

Scum - Solids that float to the top of wastewater.

Secondary Treatment - The treatment of wastewater beyond solids and grit removal. The process decreases the organic load.

Sedimentation - The process by which solids are allowed to settle by gravity.

Sedimentation Tank - Tanks used to detain wastewater while the solids settle out.

Semi-Volatile Organics - Also known as Acid Base Neutrals (ABNs). A subcategory of organic pollutants. See Appendix K for a complete list.

Separate Sewer - A sewerage system divided into a storm sewer and a sanitary sewer.

Settleable Solids - The estimated amount of sludge that will settle by sedimentation. It is a fraction of the suspended-solids.

Settled Solids - Sludge. (See sludge.)

Sewage - Any wastes, including wastes from humans, households, commercial establishments, industries, and storm water runoff, that are discharged to or otherwise enter a POTW.

Sludge - Solids, residues, and precipitate separated from or created in sewage by the unit processes of a POTW.

SOP - See System Optimization Plan or Standard Operating Procedures

Stratification - The separation of water into layers characterized by thermal differences.

Standard Operating Procedures (SOP) - Documented protocols for plant operation, laboratory procedures, etc.

Surcharging - When the capacity of the sewer is insufficient and sewage escapes through a manhole.

Surfactant - Surface-active agent. Large organic molecules that cause foaming. They are usually found in detergents.

System Optimization Plan (SOP) - Hydraulic improvements that, in conjunction with ongoing programs of municipal sewerage agencies, might promote a balanced hydraulic system. The SOP may include optimization of the collector/interceptor system upstream of regulators, to ensure that the storage and transport capacity of the system is maximized within constraints unalterable except for major structural modifications.

Thickener - The structure where sludge is sent to be thickened by removing water.

TKN - See Total Kjeldahl Nitrogen.

Total Coliform - Bacteria found in decaying matter, feces, and soil. It used as an indicator of pathogens that are present in wastewater.

Total Kjeldahl Nitrogen (TKN) - The total organic and ammonia nitrogen.

Total Phosphorus - A measure of all the forms of phosphorus, a nutrient, found in water (orthophosphates, polyphosphates, and organic phosphates).

Total Suspended Solids (TSS) - The sum of insoluble solids that either float on the surface of, or are in suspension in water, wastewater, or other liquids.

Toxic Pollutant - Any pollutant listed as toxic in Appendix D of 40 CFR Part 122, under Section 307(a)(1) of CWA.

Toxics - Pollutants that have a toxic effect on living organisms. The “priority pollutants” of CWA Section 307(a) are a subset of this group of pollutants.

Toxicity Test - A procedure to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of effect on exposed test organisms of a specific chemical or effluent.

TSS - See Total Suspended Solids.

Twelve Month Running Average - The monthly average computed using the specific month and the previous 11 months.

Unregulated Community - Dischargers not required to have Permits to discharge into MWRA sewerage system. They are not regulated or required to meet Local Limits, nor are they regulated under the Local Limits Discharge Program.

Vertical Mixing - The vertical movement of the water column caused by wind, and/or density and/or temperature differences.

Volatile Organic Acid (VOA) - Same as Volatile Organic Compound.

Volatile Organic Compound (VOC) - Same as Volatile Organic Acid.

Volatile Solids - Those solids of a suspended solid sample that are burned off in a muffle oven at 550±50 °C.

Water Quality - The chemical, biological, and physical conditions of a body of water.

Water Quality Criteria - Specific levels of pollutants that would make a body of water unsuitable for its designated use (i.e. harmful if used for drinking, swimming, farming, fishing, or industrial processes).

Water Quality Standard - A law or regulation that consists of: the beneficial designated use or uses of a water body; the numeric and narrative water quality criteria that are necessary to protect the use or uses of that particular water body; and an antidegradation statement.

Whole Effluent Toxicity (WET) - The total toxic effect of effluent, not chemical specific but rather the cumulative effect, whether it be synergistic or antagonistic, of the chemicals found in the effluent.

**K.2
Abbreviations
and Acronyms**

ABNs - Acids Bases Neutrals
BDL - Below Detection Limit
BOD - Biochemical Oxygen Demand
BWSC - Boston Water and Sewer Commission
cBOD – Carbonaceous Biochemical Oxygen Demand
CFR - Code of Federal Regulations
CSO - Combined Sewer Overflow
CWA - Clean Water Act

DEP - Massachusetts Department of Environmental Protection
DITP - Deer Island Treatment Plant
ENQUAD - Environmental Quality Department
EPA - United States Environmental Protection Agency
FY - Fiscal Year
IDL - Instrument Detection Level
I/I - Infiltration and Inflow
LC50 - Median Lethal Concentration
LD50 - Median Lethal Dose
LOAEL - Lowest Observed Adverse Effect Level
LOEC - Lowest Observed Effect Concentration
MATC - Maximum Acceptable Toxicant Concentration
MDC - Metropolitan District Commission
MDL - Method Detection Limit
MPN - Most Probable Number
MWRA - Massachusetts Water Resources Authority
NITP - Nut Island Treatment Plant
NOAL - No Observed Acute Level
NOEC - No Observed Effect Concentration
NPDES - National Pollutant Discharge Elimination System
PAH - Polycyclic (or Polynuclear) Aromatic Hydrocarbon
PCB - Polychlorinated Biphenyl
PHC - Petroleum Hydrocarbon
POTW - Publicly Owned Treatment Work
SD - Standard Deviation
SOP - Standard Operating Procedures or System Optimization Plan
SSO - Sanitary Sewer Overflow
TKN - Total Kjeldahl Nitrogen
TRAC - Toxic Reduction and Control Department
TSS - Total Suspended Solids
VOA - Volatile Organic Acid
VOC - Volatile Organic Compound
WET - Whole Effluent Toxicity [test]

K.3
Units

in/yr - inches per year
L - liter
lbs - pounds
lbs/day - pounds per day
mL/L - milliliters per liter
MG - million gallons
mgd - million gallons per day
mg/L - milligrams per liter
µg/L (or ug/L) - micrograms per liter