

**Summary of “floatables”
observations in Deer Island
Treatment Plant effluent and at the
discharge site in Massachusetts Bay:
2000-2007**

Massachusetts Water Resources Authority

Environmental Quality Department
Report ENQUAD 2008-08



Citation

Rex AC, Tyler C, Wu D, Liang, SY. 2008. **Summary of floatables observations in Deer Island Treatment Plant effluent and at the Massachusetts Bay discharge site 2000-2007**. Boston: Massachusetts Water Resources Authority. Report ENQUAD 2008-08. 20 p.

**SUMMARY OF FLOATABLES OBSERVATIONS IN DEER
ISLAND TREATMENT PLANT EFFLUENT AND AT THE
MASSACHUSETTS BAY DISCHARGE SITE
2000-2007**

Prepared by

**Andrea Rex
Charles Tyler
David Wu
Suh Yuen Liang**

**MASSACHUSETTS WATER RESOURCES AUTHORITY
Environmental Quality Department and
Deer Island Treatment Plant Process Control
100 First Avenue
Charlestown Navy Yard
Boston, MA 02129
(617) 242-6000**

September 2008

Report No: 2008-08

Acknowledgements

Thanks and appreciation are extended to staff of Battelle Memorial Institute, Duxbury Massachusetts for field operations and technical advice, and to the staff of MWRA's Department of Laboratory Services for sample analyses.

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 BACKGROUND 1

3.0 METHODS 2

3.1 EFFLUENT FLOATABLES 2

 3.1.1 Sample Collection 2

 3.1.2 Effluent floatables measurement 3

 3.1.3 Other measurements 3

 3.1.4 Pilot study 3

3.2 EFFLUENT FATS, OIL, AND GREASE, AND PETROLEUM HYDROCARBONS 4

 3.2.1 Fats, Oil and Grease 4

 3.2.2 Petroleum Hydrocarbons 4

3.3 DATA MANAGEMENT 5

3.4 AMBIENT FLOATABLES IN MASSACHUSETTS BAY 5

4.0 RESULTS AND DISCUSSION 7

4.1 EFFLUENT FLOATABLES 7

 4.1.1 Pilot study: floatables characterization 7

 4.1.2 Effluent floatables monitoring 2003-2008 9

 4.1.3 Trends over time 10

 4.1.4 Relationship between floatables and flow: regression analyses 11

 4.1.5 Adverse treatment plant events 12

4.2 EFFLUENT FATS, OIL, AND GREASE AND PETROLEUM HYDROCARBONS 14

4.3 AMBIENT FLOATABLES: DEBRIS TOWS 15

5.0 SUMMARY 17

6.0 CONCLUSIONS 18

7.0 REFERENCES 19

8.0 APPENDIX: DATA 20

LIST OF TABLES

TABLE 1. 1997 CONTINGENCY PLAN THRESHOLDS..... 1

TABLE 2. TIMELINE OF EFFLUENT FLOATABLES SAMPLING METHODS AT DITP..... 3

TABLE 3. LOCATIONS FOR NET TOWS FOR FLOATABLES IN MASSACHUSETTS BAY..... 6

TABLE 4. PILOT STUDY (OCT 18, 2002-DEC 2, 2002) DESCRIPTIVE STATISTICS OF FLOATABLES..... 9

TABLE 5. DITP EFFLUENT FLOATABLES DESCRIPTIVE STATISTICS: 2003 THROUGH JAN 2008..... 9

TABLE 6 MAJOR IMPROVEMENTS TO DITP FACILITIES AND PROCESSES 2000-2007 10

TABLE 7. RESULTS OF EFFLUENT FLOATABLES SAMPLING DURING ADVERSE EVENTS AT DITP..... 13

TABLE 8. DESCRIPTIVE STATISTICS* FOR DITP EFFLUENT FATS OIL AND GREASE AND PETROLEUM HYDROCARBONS
SEPTEMBER 2000 THROUGH JANUARY 2008..... 14

LIST OF FIGURES

FIGURE 1 EFFLUENT FLOATABLES SAMPLING DEVICE.....2

FIGURE 2 MAP OF SAMPLING LOCATIONS FOR MARINE DEBRIS TOWS IN MASSACHUSETTS BAY (STATION N01 IS CONTROL, STATION N21 AT OUTFALL IS SHOWN IN INSET, NEAR RISER 14)6

FIGURE 3. TYPICAL EFFLUENT FLOATABLES SAMPLE, SORTED INTO NON-DEGRADABLE (PLASTIC) AND DEGRADABLE FRACTIONS7

FIGURE 4. TOTAL DRY WEIGHT FLOATABLES CONCENTRATION VS. DEGRADABLE FLOATABLES CONCENTRATION8

FIGURE 5. TOTAL DRY WEIGHT FLOATABLES CONCENTRATION VS. NON-DEGRADABLE FLOATABLES CONCENTRATION.8

FIGURE 6. DITP EFFLUENT FLOATABLES AND PLANT FLOW OVER TIME AGGREGATED BY MONTH, 2003-2008.....10

FIGURE 7. PERCENTILE BOX PLOTS ILLUSTRATE INTER-ANNUAL VARIATION IN FLOATABLES VOLUME AND WEIGHT (2008 DATA ARE FOR JANUARY ONLY).11

FIGURE 8. REGRESSIONS OF FLOATABLES VOLUME AND WEIGHT ON FLOW11

FIGURE 9. REGRESSION OF LOG-TRANSFORMED FLOATABLES VOLUME AND FLOATABLES WEIGHT ON FLOW.....12

FIGURE 10. AVERAGE PHC AND FOG IN DITP EFFLUENT OVER TIME14

FIGURE 11. MARINE DEBRIS TOW CONTENTS BEFORE THE BAY OUTFALL WAS OPERATIONAL15

FIGURE 13. RESULTS OF AMBIENT MARINE DEBRIS OBSERVATIONS FEBRUARY 2000-FEBRUARY 2008. TEN SAMPLES WERE COLLECTED AT THE BOTH CONTROL AND OUTFALL SITES BEFORE THE OUTFALL WENT ONLINE, 95 SAMPLES AT EACH SITE AFTER THE OUTFALL WENT ONLINE.16

1.0 Introduction

Marine debris has been an ongoing issue in the Gulf of Maine (Hoagland and Kite-Powell 1997). An early environmental concern related to the Massachusetts Water Resources Authority (MWRA)’s use of an effluent outfall to discharge to Massachusetts Bay was that the aesthetics of the marine environment would be protected, and that the discharge would not contain “floatable” material (particularly plastics and petroleum oil and grease) that could be an aesthetic nuisance or harm marine life. MWRA has monitored floatables in the effluent from Deer Island Treatment Plant (DITP) since 2002, and in the waters of Massachusetts Bay since 2000. This report presents the results of MWRA’s floatables monitoring program from treated effluent monitored at the plant, and from ambient waters collected in the field at the discharge site.

2.0 Background

Early in the planning of the effluent outfall monitoring program, before DITP was built, two Contingency Plan thresholds aiming to measure effluent floatables were developed, shown in Table 1 (MWRA 1997 November).

Table 1. 1997 Contingency Plan thresholds

PARAMETER TYPE/LOCATION	PARAMETER	CAUTION LEVEL	WARNING LEVEL
Effluent	Floatables	None	5 gallons/day in final collections device
	Oil and grease (petroleum)	None	15 mg/L weekly

However, as the new DITP began to come online in the late 1990s, it became clear that it was not logistically feasible to measure floatables in the “final collection devices” which were inaccessible tip tubes in the secondary clarifiers. In 2000, MWRA requested Outfall Monitoring Science Advisory Panel and regulatory review of the floatables Contingency Plan threshold. As a result of this review, revised floatables requirements were included in the first revision of the Contingency Plan (MWRA 2001). The revised plan deleted the trigger parameters and thresholds for floatables, but required MWRA to “make regular observations of wastewater during treatment to determine whether floatables are removed as expected and whether oil and grease discharges are within the limits established by the NPDES permit.” MWRA developed a sampling device to measure floatables in the final effluent at DITP and has also been monitoring oil and grease, and petroleum hydrocarbons in the final effluent.

In addition to effluent sampling, MWRA incorporated sampling for floatables at the outfall site in Massachusetts Bay, using a net, during nearfield water column monitoring surveys. This sampling began in 2000 before the outfall came online, and includes an area directly over the outfall as well as a control site northwest of the outfall.

MWRA first presented results of effluent floatables sampling to OMSAP and the regulatory agencies in 2003 (MWRA 2003). This report is a comprehensive summary of the results of monitoring for floatables in effluent and ambient waters.

3.0 Methods

3.1 Effluent Floatables

The requirement to monitor publicly owned treatment works (POTW) effluent floatables is unusual; there is no EPA-approved standardized method for sampling, characterizing and quantifying this parameter. Therefore, MWRA developed its own procedures and carried out a pilot study in 2002 to verify that the measurements were consistent and reproducible.

3.1.1 Sample Collection

An innovative floatables sampling device designed by MWRA staff was fabricated and put into use in 2002 (Figure 1). The effluent floatables sampling system collects samples at the end of the west disinfection basin, after the final tip tube and scum baffle, prior to discharge to the outfall structure. Three 4-inch sample collection lines, labeled "south", "middle", and "north", extend into the effluent. The sampling is flow-paced. Typically, collection occurs over all three lines, although sampling staff can select which line(s) to use if necessary for logistical reasons. A self-priming sample pump collects from the sample lines and passes the effluent through a rotary drum screen with 0.1-inch mesh size. An 8-inch drain pipe returns the liquid effluent to the waste stream. A hopper collects the floatables caught in the drum screen, and DITP staff collect the floatables samples from the hopper. All material in the screen frame as well as material still clinging to the screen blade assemblies is collected utilizing flexible tools. Material is collected into clean strainer-containers to remove excess free water, and then transported to the laboratory for measurement.



Figure 1. Effluent floatables sampling device

The sample collection system operates almost continuously, with the hopper being emptied and the floatables measured at regular intervals. The sampling periods have ranged from three days to slightly over two weeks. Sampling periods were initially shorter, during the pilot study, as quantitation methods were developed. The sampling periods were lengthened over time to achieve a more integrated measure, and also for staff efficiency.

3.1.2 Effluent floatables measurement

Once in the laboratory, the sample is placed in a graduated strainer container with drain holes of < 0.1 inch, to ensure drainage of excess water, and uniform and accurate volumetric measurement of the collected material. The material in the graduated strainer is overlaid with a solid plate, which is firmly seated by hand pressure, and then weighted with a 2-kg weight for at least 5 minutes. This compression results in a uniform volumetric measurement without the effects of free-pooling water or entrapped air. Volume is determined from the position of the bottom edge of the compression plate, and estimated to the nearest 50 mL.

After the volume is measured, the collected material is placed in a pre-weighed, shallow, impervious container for oven-drying. The sample is dried for at least 6 h at 103 °C , then the sample is weighed to the nearest 0.1 g.

Floatables quantities are standardized to plant flow and sampling time, and reported as parts per billion effluent.

3.1.3 Other measurements

Related parameters measured include plant flow and flow through the sampling device.

3.1.4 Pilot study

A pilot study was done in three phases during June 2002 through December 2002 to develop and standardize the sampling and measurement methods. Table 2 shows the phases of the study. Early in the pilot study, samples were sorted into degradable and non-degradable materials. As described in Section 4, Results, there was a consistent relationship between dry weight and dry volume and proportion of degradable and non-degradable fractions of the sample. After the pilot study period, the samples were no longer sorted into degradable and non-degradable fractions. Samples were collected and measured using consistent methods, with the major change being a lengthening of the nominal sample period from one week in 2003 to two weeks in 2004-2008. There is variation in the sampling period for logistical reasons.

Table 2. Timeline of effluent floatables sampling methods at DITP

DATES		SAMPLING PERIOD (DAYS) MEAN ± ST. DEV.	ACTIVITY
2002 Pilot study	June 16-Sept 23	8.5 ± 4.6	Separated and quantified degradable and non-degradable, measured by dry weight. (Treatment plant upset Aug 12-26)
	Sept 24-Oct 18	6.2 ± 3.4	Degradable and non-degradable materials not separated. Compression constant and technique for volumetric measurement adjusted.
	Oct 19- Dec 2	4.1 ± 1.2	Consistent methodology established for measuring dry weight and volume.
2003		6.5 ± 3.3	Nominal 1-week sampling periods.
2004		14 ± 6.7	Nominal 2-week sampling periods.
2005		16.2 ± 8.5	
2006		20.5 ± 6.6	
2007		18 ± 6.3	
2008 (Jan-Feb)		16.5 ± 3.5	

3.2 Effluent Fats, Oil, and Grease, and Petroleum Hydrocarbons

3.2.1 Fats, Oil and Grease

Fats, oil, and grease (FOG) is measured as the hexane extractable fraction by EPA Method 1664 Revision A. In brief, extractable materials that may be determined are relatively nonvolatile hydrocarbons (i.e. vegetable oils, animal fats, waxes, soaps, greases) and related materials. A 500-mL grab sample is collected weekly from the final effluent (disinfection basin). Aqueous samples are filtered through an activated C18 disk that is selective for fats oils and greases. The disk is air dried and hexane is used to elute the disk. The product is collected in 40- mL VOA vials, then transferred to pre-weighed aluminum pans. The hexane is evaporated from the extract. The pans are weighed a second time and the extracted residue is quantified gravimetrically. (Note, after July 2, 2007 when the analysis was done by a different laboratory the reporting limit was lower.)

3.2.2 Petroleum Hydrocarbons

From September 2000 through June 2007 petroleum hydrocarbons (PHC) were measured by MWRA's Department of Laboratory Services (DLS). The DLS method is a solid-phase extraction system using Octadecyl (C18) extraction disks and methylene chloride (DCM) as the eluting solvent. Extracts are dried with sodium sulfate and a silica gel cleanup is performed to remove polar hydrocarbons such as fatty acids and surfactants that can interfere with the analysis. Extracts are then concentrated and analyzed by GC/FID. The total hydrocarbon FID response from Octane (n-C8) to tetracontane (n-C40), excluding the surrogates and any non-petroleum hydrocarbon (NPHC) peaks, is quantified as the petroleum product result. Any silica gel SPE cartridge background response is subtracted from the result.

Sample response is separated into lightweight, mid-weight and heavyweight ranges, based on retention time markers contained in the calibration standards. External standard quantitation is performed using the average calibration factor of the n-alkanes eluting within each range. The results for the individual ranges are then summed to determine the total PHC result.

After July 2, 2007 PHC samples were sent to a contract laboratory. Now, petroleum hydrocarbons are measured as extractable petroleum hydrocarbons (EPH) using the Massachusetts Department of Environmental Protection Method for the Determination of Extractable Petroleum Hydrocarbons, (MADEP-EPH-04 Revision 1.1 May 2004). A 500-mL grab sample is collected weekly from the final effluent (disinfection basin). The sample is extracted with methylene chloride, dried over sodium sulfate, solvent exchanged into the hexane, and concentrated into a Kuderna-Danish apparatus. The sample cleanup and separation into aliphatic and aromatic fractions is accomplished using commercially available silica gel cartridges or prepared silica gel columns. The two individual fraction extracts produced are re-concentrated to a final volume of 1 mL. The concentrated extracts are then separately analyzed by a capillary column gas chromatograph equipped with a flame ionization detector. The resultant chromatograph of aliphatic compounds is collectively integrated within the C₉ through C₁₈ and C₁₉ through C₃₆ ranges. The resultant chromatograph of aromatic compounds is collectively integrated within the C₁₁ through C₂₂ range.

3.3 Data Management

Data management, quality assurance, audit, and corrective action procedures are documented in the MWRA Department of Laboratory Services (DLS) Quality Assurance Management Plan (QAMP), and will not be repeated in detail here. All data are recorded initially into bound laboratory notebooks or onto established data forms. The laboratory supervisor responsible for sample management has custody of the sampling logs associated with custody and tracking. Field measurements and laboratory analytical results are entered into the DLS Laboratory Information Management System (LIMS). After data have been validated and approved by the DLS, Deer Island Process Monitoring staff exports the records from LIMS for inclusion into the Deer Island Treatment Plant Operations Management System (DITP OMS) Oracle database. Section 7.0 of the QAMP documents data validation and reporting procedures. DLS' audit procedures are documented in Section 9.0 and corrective action procedures are documented in Section 11.0 of the QAMP. In addition, the Program Manager, Process Engineering reviews all data for technical reasonableness.

The Review, Validation, and Approval processes described in the QAMP are employed to ensure conformity with DLS and with client data quality requirements. Reported results must be traceable, i.e., verifiable by review of its associated documentation. All laboratory results for a given sample must be traceable throughout the entire analytical process applied to the sample. Traceability is maintained through LIMS (which stores all of the pertinent data associated with the sample) and by the utilization of various logbooks (preparation, analytical, and instrumental), instrument raw data printouts, electronic files, and spreadsheets. If the data are not consistent with the QC objectives specified in the QAMP reviewers mark the data as invalid and it is excluded from or flagged as invalid in the DITP OMS database.

Effluent floatables data was not collected by DLS, rather DITP process control staff measured the floatables directly and entered the data directly into a computer spreadsheet.

3.4 Ambient Floatables in Massachusetts Bay

MWRA added surface net tows to sample for plastics and other such floatable objects to its water column monitoring program in 2000, before the outfall came online. On all nearfield surveys, a Neuston net (1 x 2 meter with 500- μ m mesh) is towed twice to capture any floating debris. The first tow, the control site, begins 0.5 miles along heading 300° from station N01. The tow is conducted at a heading of 060° for 10 minutes at 2 knots. The second tow, is conducted in the vicinity of the outfall over the diffuser (Station N21), also for 10 minutes at 2 knots. The tow starts to the south of the outfall and is conducted at a heading of 45° for 10 minutes at 2 knots, crossing the diffuser line on the transect. Table 3 shows the coordinates for the sampling stations, and Figure 2 shows the locations on a map. The beginning and end coordinates of each tow are recorded on the survey log.



From 2000 through 2003 there were 17 surveys planned per year; beginning in 2004 the sampling plan was modified to 12 surveys per year (MWRA 1997, MWRA 2004).

After a net tow is completed, the sample is emptied into a white dissection basin for a visual, qualitative inspection. Types and relative amounts of anthropogenic and natural debris are documented in the survey

log. Each sample has been digitally photographed with the date, time, and survey ID, along with a ruler for visual scale. If macro algae obscure contents, they are removed and a second photo taken. Identifiable anthropogenic materials (e.g., plastics) are retained and archived. Descriptions of the field observations, digital images, and descriptions of the contents of the nets are included in the survey e-mail summary and described in the survey report. For details of how the surveys are conducted see the Combined Work/Quality Assurance Project Plans for Water Column Monitoring, for example, Libby et al. 2008.

Table 3. Locations for net tows for floatables in Massachusetts Bay

STATION	LATITUDE (N)	LONGITUDE (W)	WATER DEPTH (M)	STATION TYPE
N01	42.419	-70.865	31.2	Control
N21	42.388	-70.785	34.8	Outfall Diffuser

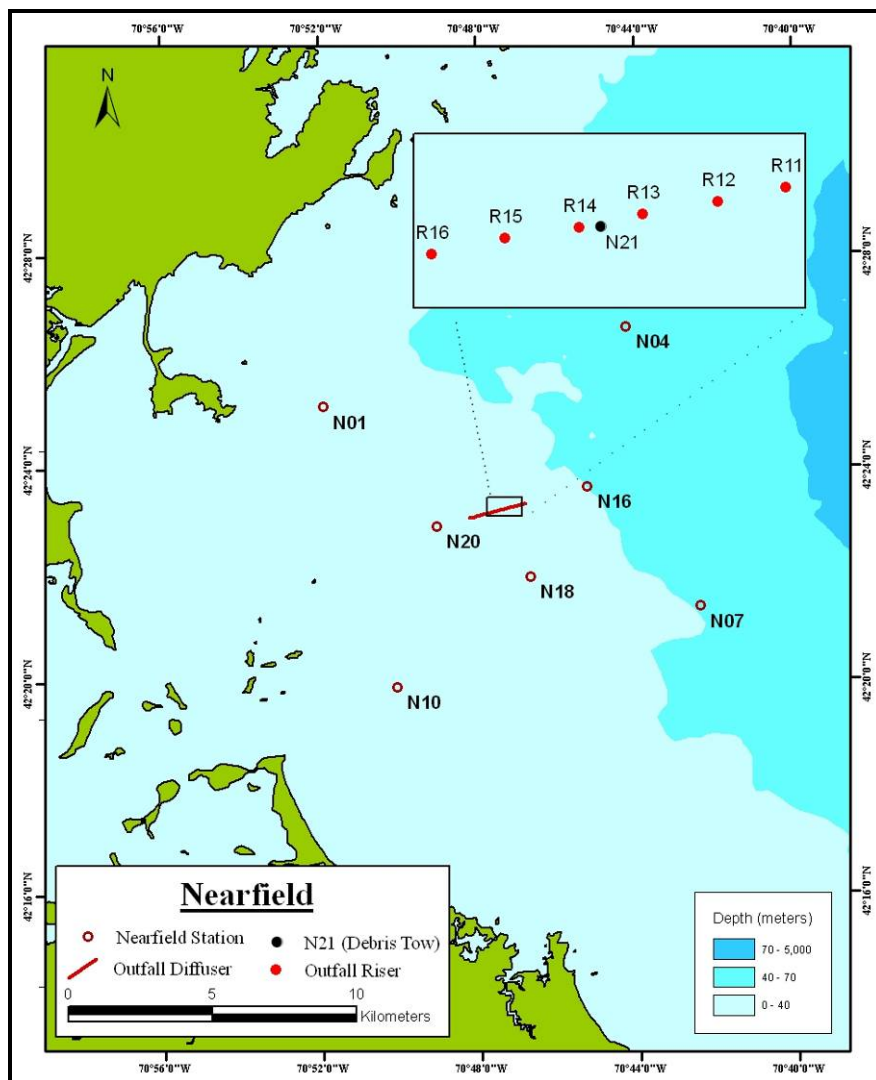


Figure 2. Map of sampling locations for marine debris tows in Massachusetts Bay (station N01 is the control, station N21 at the outfall is shown in inset, near Riser 14) .

4.0 Results and Discussion

4.1 Effluent Floatables

This section presents the effluent floatables results in two parts: the pilot study during 2002, and the routine sampling during Jan 2003 through Jan 2008. Raw data for all samples are in Appendix A.

4.1.1 Pilot study: floatables characterization

During the first phase of the pilot study the samples were examined in detail and were sorted into non-degradable and degradable material; a typical sample after sorting is shown in Figure 3. Most of the material is broken into small pieces, less than an inch in diameter. Floatables of concern, such as plastic bags or condoms are rare. Much of the non-degradable material is fruit labels; much of the degradable material is small bits of fat.

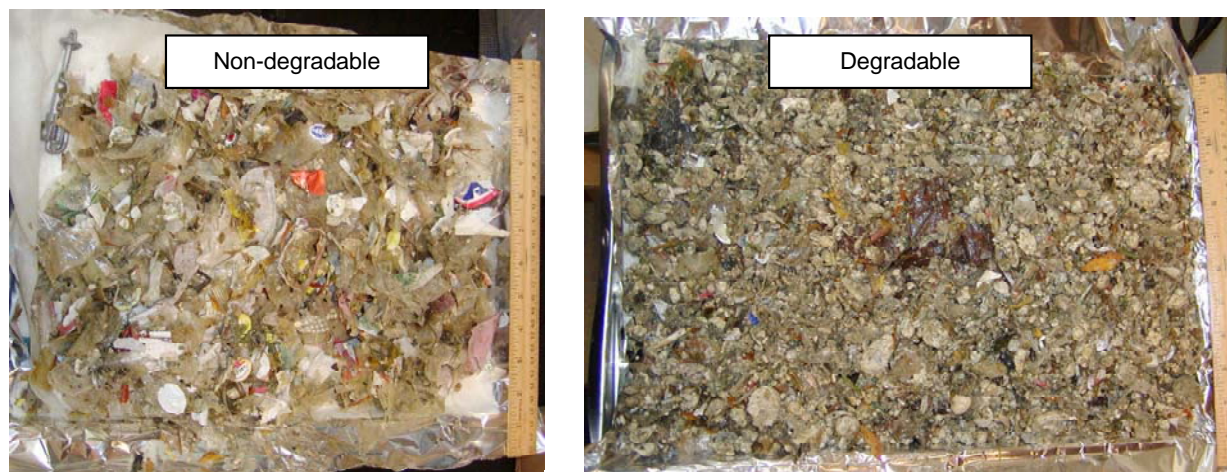


Figure 3. Typical effluent floatables sample, sorted into non-degradable (plastic) and degradable fractions

Separating the degradable from non-degradable floatables was tedious and time-consuming and the apportionment was somewhat subjective, providing reason to try to eliminate this step. The data were analyzed to determine if there was a consistent relationship between total amount of material and the degradable and non-degradable portions.

There were strong relationships between total dry weight vs. degradable (Figure 4, $R^2 = 0.99$) and total dry weight vs. non-degradable (Figure 5, $R^2 = 0.82$) fractions. These figures exclude the two abnormal samples collected during the secondary treatment upset period in August 2002. Thus, the total dry weight of floatables is a good estimator for the amount of both degradable and non-degradable materials in the samples; total floatables are comprised of about 86% degradable and 14 % non-degradable material.

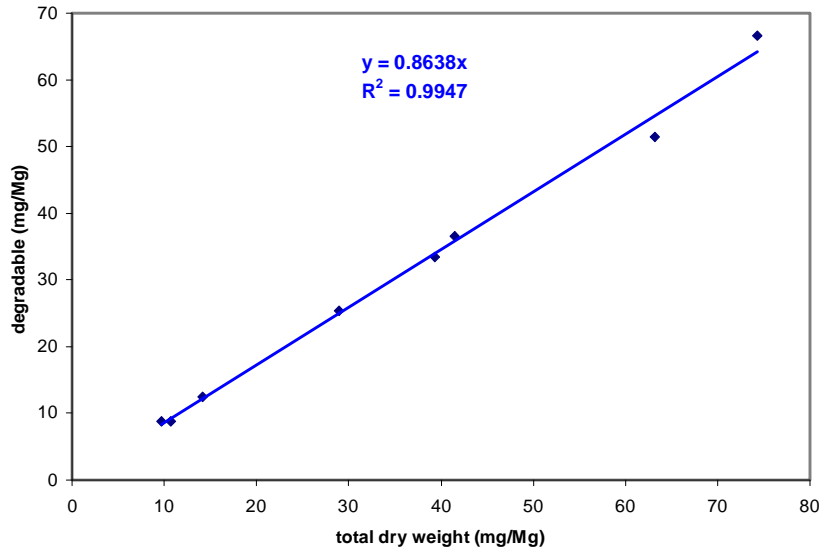


Figure 4. Total dry weight floatables concentration vs. degradable floatables concentration

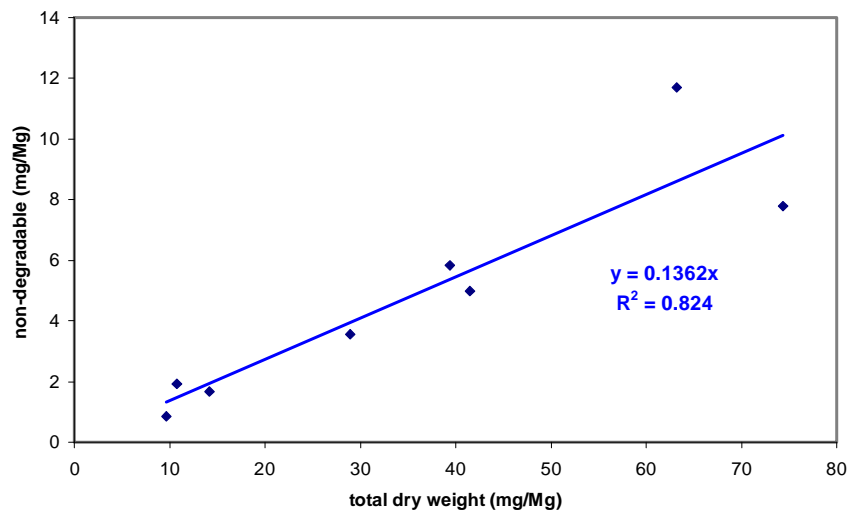


Figure 5. Total dry weight floatables concentration vs. non-degradable floatables concentration

Table 2 shows the statistical summary of the floatables data during the pilot study. The data distributions of the floatables by volume and weight were log-normal according to the Shapiro-Wilk normality test. Therefore, the mean from the log-transformed data is an unbiased estimator of the population mean. The unbiased mean and standard deviation for floatables by volume and weight after antilog transformation are 123 (2.4) mL/ML (milliliters per million liters or ppb) and 29 (2.6) mg/Mg (milligrams per million grams or ppb), respectively. Therefore, during the pilot study, for every 100 million gallons of effluent, there were about 12 gallons or 11 kg of floatables.

There is a strong linear relationship ($p < 0.01$, $r = 0.995$) between the volume and the weight of floatables, indicating a consistency in density of the floatable samples. Visual field observations are also that the characteristics of the floatable samples are consistent among samples.

Table 4. Pilot study (Oct 18, 2002-Dec 2, 2002) descriptive statistics of floatables

	VOLUME (mL/ML or ppb)	WEIGHT (mg/Mg or ppb)	log10(VOLUME)	log10(WEIGHT)
Sample Size	11	10	11	10
Mean	177.8	43.45	2.092	1.462
Median	102.1	30.4	2.009	1.465
Min	38.9	8.386	1.59	0.9236
Max	510	126.9	2.708	2.104
Range	471.1	118.6	1.118	1.18
Standard Deviation	165.5	41.57	0.3848	0.4156
Coefficient of Variation	0.9305	0.9568	0.1839	0.2844

4.1.2 Effluent floatables monitoring 2003-2008

Once the pilot study established a consistent sampling and measurement methodology, data collection was carried out routinely. The data described in this section were collected from January 2003 through the end of January 2008. One hundred eleven samples were collected spanning a total of 1,508 days of treatment plant operation, during all types of weather and all levels of flow. The sample with the highest volume of floatables (673 ppb) was in March 2003, during a 3.1-day period when the mean flow was 627.6 mgd. In comparison, a 3.1 day period in February 2003 had one of the lowest floatables volumes measured: 57.8 ppb when the average flow was 345 mgd. (Data from the shorter sampling periods which took place in 2003 are more likely to reflect the extremes of values.) The amount of non-degradable floatables is estimated as 14% of the mean floatables weight, and averaged 6 ppb overall.

Table 5. DITP Effluent Floatables Descriptive Statistics: 2003 through Jan 2008

YEAR	N SAMPLES	MEAN DAYS/SAMPLE (SD)	MEAN FLOW DURING SAMPLING (MGD)	FLOATABLES VOLUME (PPB)		FLOATABLES WEIGHT (PPB)		
				MEAN	GEOMEAN	MEAN	GEOMEAN	EST. NON- DEGRADABLE (PPB)
2003	36	6.8 (4.07)	424	201	148	57	41	8
2004	16	14 (6.69)	355	236	190	59	46	8
2005	21	16.2 (8.5)	402	156	137	43	36	6
2006	17	20.5 (6.5)	399	112	76	30	17	4
2007	19	18 (6.3)	345	112	91	30	26	4
2008	2	16.5 (3.4)	396	83	80	35	29	5
Total	111	13.7	393	168	125	45	33	6

4.1.3 Trends over time

Figure 6 shows treatment plant flow and effluent floatables averaged by month 2003-2008. Overall, the trends for amounts of effluent floatables parallel treatment plant flow, with less during low-flow periods and increased amounts during higher flows. This is reasonable, because it is likely that periods of high flow, which are due to wet weather, bring more floatable material (street refuse, etc.) into the treatment plant. Also during periods of high flow, removal efficiency may be somewhat less.

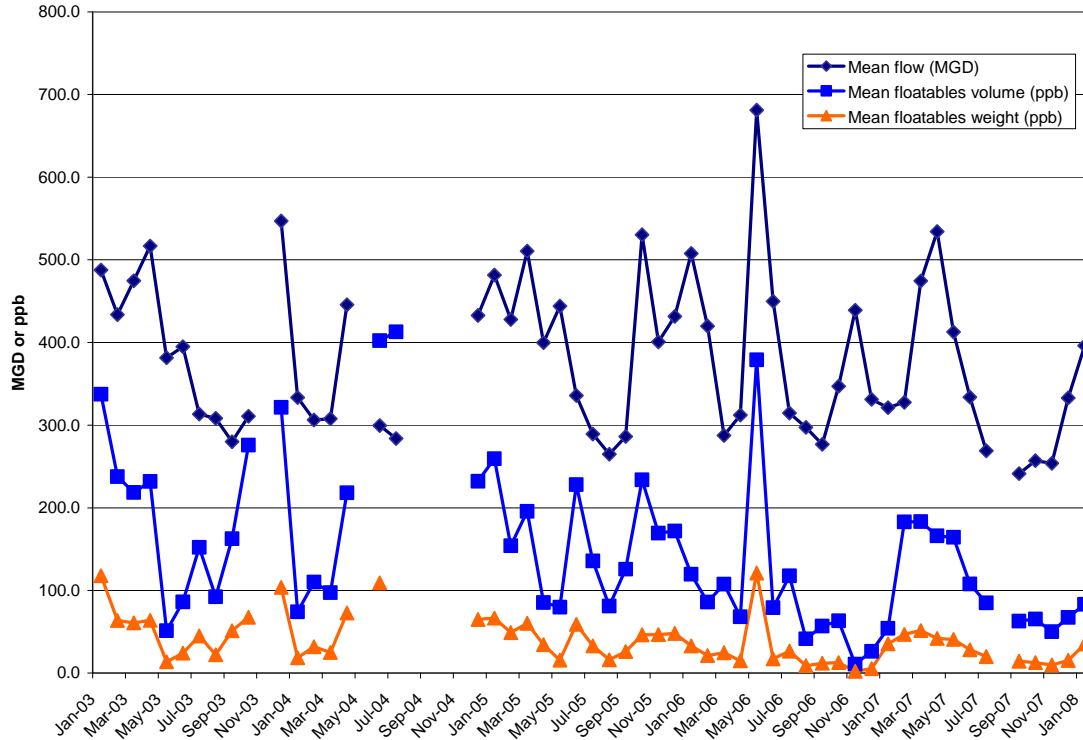


Figure 6. DITP Effluent floatables and plant flow over time grouped and averaged by month, 2003-2008.

As shown in Table 6, improvements and upgrades to the facilities and treatment processes were made from 2004 through 2007. In addition, improvements to the secondary treatment process which began in early 2005 increased the amount of flow through secondary treatment, and thus the secondary clarifiers. Inter-annual patterns of the amounts of floatables are shown as percentile box plots in Figure 7. Overall, amounts are lower in 2006 and 2007 than for 2003-2005.

Table 6. Major improvements to DITP facilities and processes 2000-2007

DATE	IMPROVEMENT
September 6, 2000	New outfall diffuser system online
March, 2001	Upgrade from primary to secondary treatment completed
October, 2004	Upgrades to secondary facilities (clarifiers, oxygen generation)
April 2005	Sludge/filtrate line between Deer Island and Fore River operational
2005-2007	Improved removal of TSS etc due to more stable process

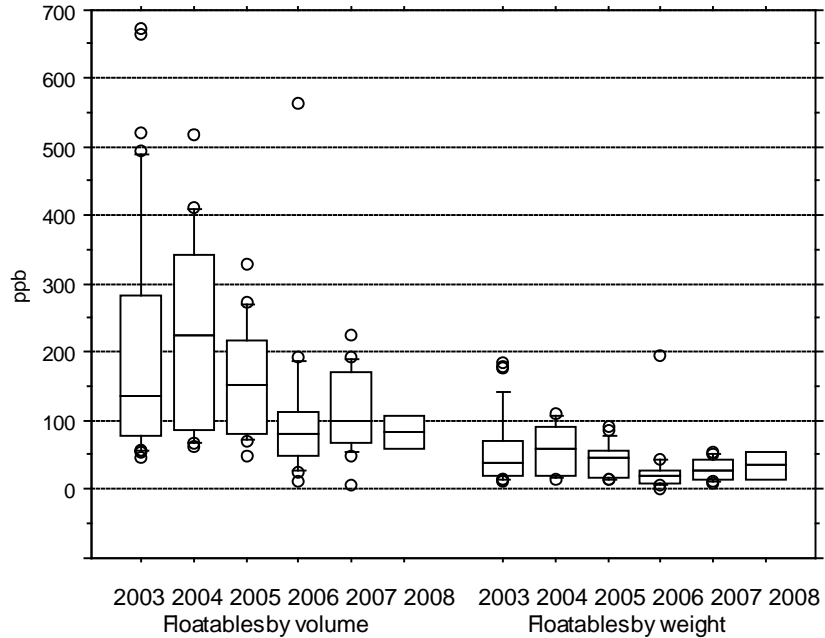


Figure 7. Percentile box plots illustrate inter-annual variation in floatables volume and weight (2008 data are for January only).

4.1.4 Relationship between floatables and flow: regression analyses

Regression analyses of floatables by volume and weight on flow are shown in Figures 8 and 9. Both non-transformed and log-transformed data are analyzed.

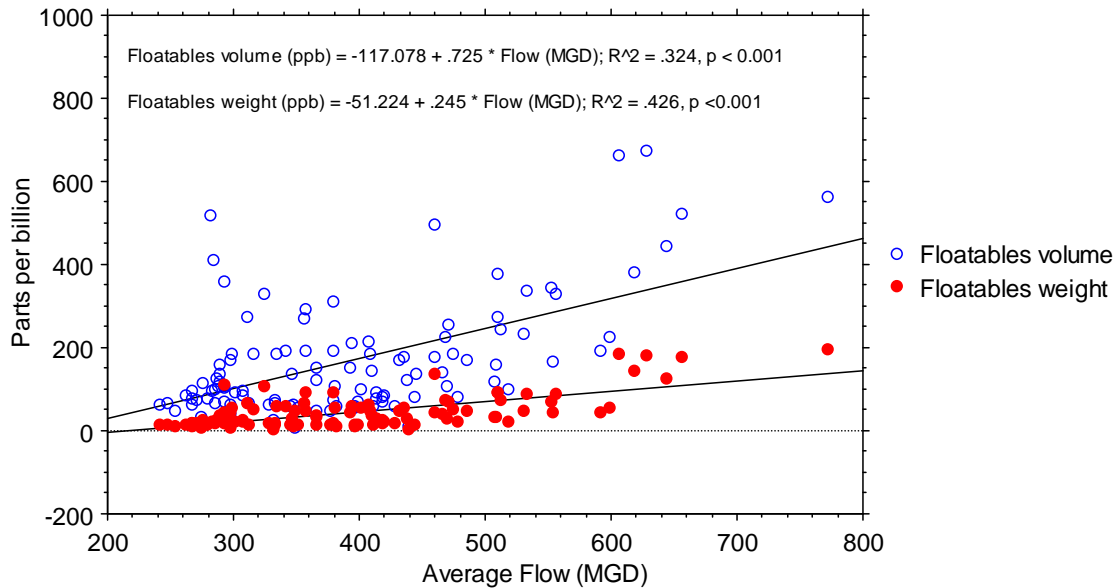


Figure 8. Regressions of floatables volume and weight on flow

For non-transformed data, flow explains 32% of the variance in floatables volume and 43% of the variance in weight, and both regressions are highly significant ($p < 0.001$). The regression models predict, for example, that for average flow of 350 mgd, average floatables volume is 137 ppb and the average floatables weight is 34 ppb.

Log-transformation of the floatables data improves the fit to assumptions of normality and the significance level improves ($p < 0.001$).

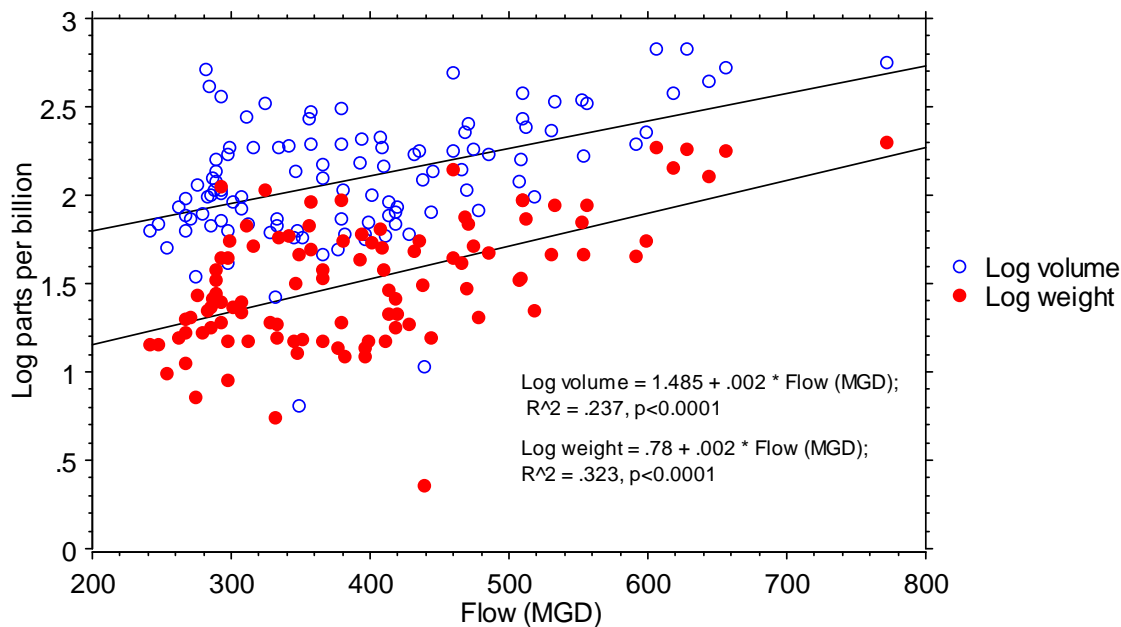


Figure 9. Regression of log-transformed floatables volume and floatables weight on flow.

Using the same examples of flow as above, at average flows of 350 mgd, the Log volume is 2.185, geometric mean volume is 153 ppb, log-transformed floatables weight, at 350 mgd Log weight is 1.48, geometric mean is 32 ppb.

4.1.5 Adverse treatment plant events

Table 7 summarizes data from samples collected during “adverse events.” There is not a formal definition of adverse events with respect to floatables, but we have included the following. In August 2002 there was an upset of the secondary treatment process caused by an industrial discharge containing high levels of sulfates. The upset was associated with excess growth of filamentous bacteria, which interfered with the settling process and caused violations of MWRA’s permit limit for total suspended solids. A more common type of adverse event is periods of high flow during storms or snow melt; this decreases the amount of flow receiving full secondary treatment (increases blending). Also, there have been several occasions during high flow when brief flooding of secondary clarifiers has occurred. The analyses above in sections 4.1.3 and 4.1.4 quantify the relationship between flow and floatables measured; Table 7 shows data from samples collected during high flow events.

Table 7. Results of effluent floatables sampling during adverse events at DITP

EVENT	SAMPLING START DATE	SAMPLING END DATE	SAMPLE PERIOD (DAYS)	MEAN PLANT FLOW (MGD)	MEAN FLOATABLES (PPB DRY WEIGHT)		
					NON-DEGRADABLE ¹	DEGRADABLE ²	TOTAL
Pilot study 2002							
Secondary upset	8/12/2002	8/19/2002	7	252	4.5	91	95.5
Secondary upset	8/19/2002	8/26/2002	7	271	12.7	120.2	132.9
Storm	10/15/2002	10/18/2002	3	353	11.0	67.3	78.3
Storm	10/25/2002	10/29/2002	4	389	17.7	108.8	126.5
Storm	11/12/2002	11/15/2002	3	429	6.6	40.2	46.8
Extreme storm	11/15/2002	11/19/2002	4	532	14.9	91.6	106.5
Extreme storm	12/10/2002	12/16/2002	6	518	19.9	122.2	142.1
Storm	12/20/2002	12/23/2002	3	609	26.1	160.6	186.7
Storm	1/3/2002	1/7/2002	4	618	20.1	123.3	143.4
Floatables monitoring 2003-1/31/2008							
Storm, snowmelt	1/31/2003	2/4/2003	4	357	12.9	79.5	92.4
Storm	2/21/2003	2/25/2003	4	533	12.2	75.1	87.3
Storm, snowmelt	2/28/2003	3/3/2003	3	460	19.4	119.3	138.7
Rain, snowmelt	4/3/2003	4/8/2003	5	552	9.8	60.3	70.1
Heavy rain	4/11/2003	4/18/2003	7	643	17.8	109.5	127.3
Rain, sustained high flow	12/15/2003	12/22/2003	7	656	24.7	151.9	176.6
High flow	3/17/2005	4/14/2005	28	553	6.4	39.7	46.1
High flow ³	10/12/2005	11/9/2005	28	530	ND	ND	ND
High flow	1/19/2006	2/8/2006	20	508	4.6	28.4	33
Sustained very high flow	5/12/2006	5/25/2006	13	771	27.6	169.4	197
Heavy rains, plant flooding 6/7-6/10	5/25/2006	6/12/2006	18	591	6.3	39	45.3
High flow	4/4/2007	4/24/2007	20	599	7.7	37	54.7
Historical Average	1/1/2003	1/31/2008	13.7	393	6	39	45
¹ Beginning September 2002, not directly measured. Estimated as 14% of total. ² Beginning September 2002, not directly measured. Estimated as 86% of total.. ³ No weight data, scale malfunction.							

Both process upsets and high flows can increase the amount of floatable material in the effluent. Nevertheless, the amount of floatables in the effluent was small even during adverse conditions. Even the most dramatic high flow period during May 2006 (mean flow of 771 mgd over 13 days, almost double the historical mean flow) generated <200 ppb total floatables by weight, and an estimated <30 ppb of inert floatables. During the secondary process biological upset a greater proportion of degradable floatables was collected; the amounts of inert materials were similar to the historical average.

Not every adverse event resulted in increased amounts of floatables in the effluent. For example, high flows in March-April 2005, January-February 2006, and flooding in May-June 2006 yielded about average levels of floatables in the effluent samples.

4.2 Effluent Fats, Oil, and Grease and Petroleum Hydrocarbons

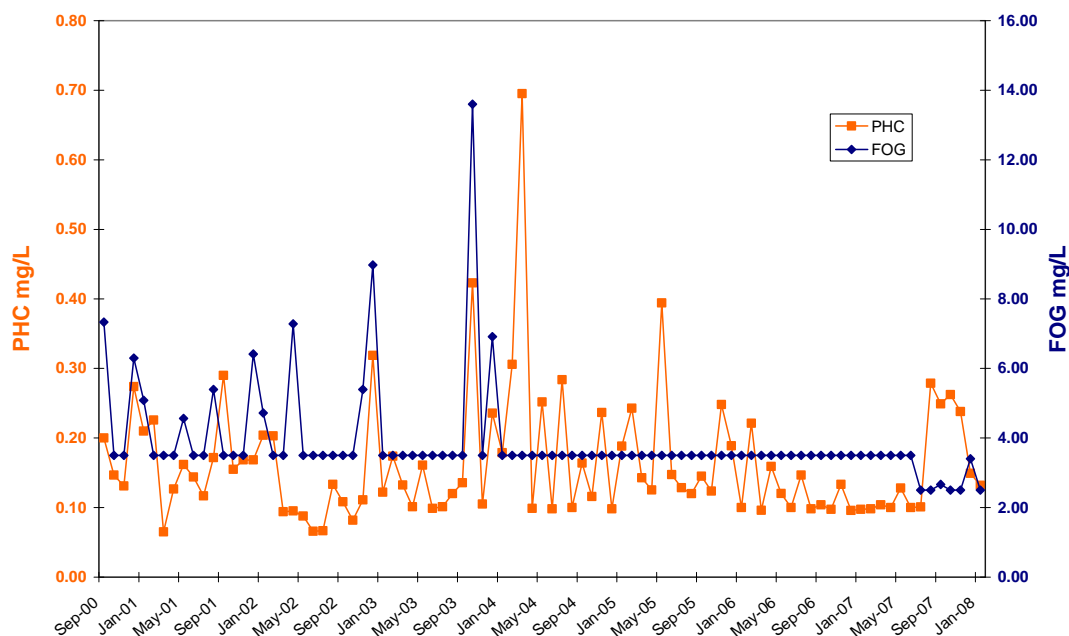
From September 2000 through January 2008, 489 effluent samples were tested for total fats, oil, and grease (FOG) and 487 samples for petroleum hydrocarbons (PHC). For FOG, all but 21 samples (96%) had levels below the detection limit. For PHC, 298 of 487 samples were non-detects. Table 8 summarizes the monitoring data. The Contingency Plan threshold for oil and grease (petroleum) is a weekly average of 15 mg/L. Based on monthly data, the highest weekly average for PHC was 0.7 mg/L, and the highest single sample was 1.6 mg/L, well within the threshold. Even FOG, which includes non-petroleum fat, is well below 15 mg/L. Figure 10 plots the monthly average data from September 2000 through January 2008. The most notable temporal trend is that beginning in 2004, FOG was consistently not detected, except for one single sample (7.9 mg/L) collected December 24, 2007 (during a period of exceptionally high flow and wet weather). The highest single sample, 54 mg/L was collected October 27, 2003. Notes on the effluent floatables sample data earlier in October say “abundant heavy greasy matter in sample.”

Table 8. Descriptive statistics* for DITP effluent fats, oil and grease and petroleum hydrocarbons September 2000 through January 2008

		Fats, Oil, and Grease	Petroleum Hydrocarbons Threshold = 15 mg/L
N		489	487
Non-detects		468	298
Mg/L	Mean (SD)	3.89 (3.32)	0.165 (0.167)
	Minimum	2.5	0.050
	Maximum	54	1.60
	Geometric Mean	3.60	0.128
	Median	3.5	0.100
	Highest weekly mean (based on monthly average)	13.6	0.7

*Statistics calculated with non-detects as ½ the detection limit. While this method of handling results below the detection limit is of questionable statistical validity, it is simple and generally accepted by EPA. Because these data are so far below the threshold, the practical effect of this method for purposes of this report is small.

Figure 10. Average PHC and FOG in DITP effluent over time



4.3 Ambient Floatables: Debris Tows

Marine debris tows were routinely added to the water column surveys in February 2000 (the outfall start-up was in September 2000), and digital photographs were taken of the contents of the net tows. Between February 2000 and the end of February 2008 there were 106 net tow surveys. For logistical reasons, one of those surveys only collected at the control site, and one survey only sampled at the outfall site, resulting in 105 samples each from the control and outfall sites. Below are sample images of net tow contents and a summary of findings. All the raw data images and survey report descriptions are available on request. Figure 11 illustrates examples of non-outfall related debris in tows taken in August 2000, before the outfall went online. Tow #1 is at site N01, the control station, and Tow #2 is the outfall site. Tow #1 is mostly seaweed. Tow #2 also has some marine plant matter and trash including colored balloons. Figure 12 illustrates the contents found in some tows after the outfall was online. Tow #1 the control site, has a piece of paper; Tow #2 at the outfall site has some white colored particles. Laboratory examination of the particles was consistent with bits of fat.

Marine debris observations were recorded in survey reports, and those observations were tabulated as presence-absence data for paper, plastic, and/or grease as particles of fat (petroleum-related grease was not observed). Results of these ambient observations for the control site and the outfall site are shown in Figure 13.

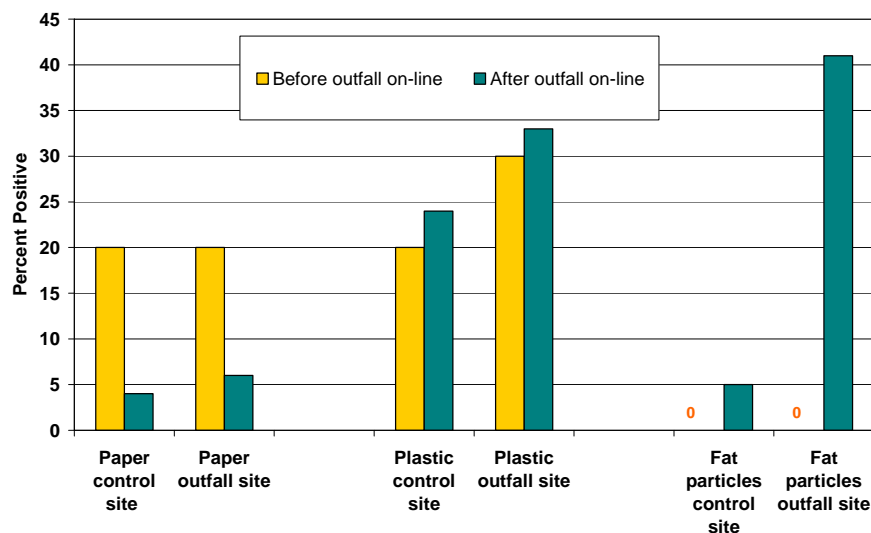


Figure 11. Marine debris tow contents before the bay outfall was operational



Figure 12. Marine debris tow contents showing white particles at outfall site Tow #2 on right.

Figure 13. Results of ambient marine debris observations, February 2000-February 2008. Ten samples were collected at the both control and outfall sites before the outfall went online, 95 samples at each site after the outfall went online.



Plastic or paper materials were observed at both the control site and the outfall site during 2-3 of the 10 surveys before the outfall went online. After the outfall went online, for plastics, the outfall site had slightly more observed incidences (33%) than the control site (24%); the same was true for observations of paper. None of the plastics and papers observed at either site were typical sewage-derived “floatables of concern” such as condoms, tampon applicators, or toilet paper—rather the debris observed was typical of the kind of trash (plastic bags, paper towels, paper containers, even balloons) that would be discarded from a boat or could have floated from the shoreline. However, there was a substantial difference between control and outfall incidence of the presence of grease-fat particles, which after outfall start-up were observed in 39 of 95 tows from the outfall site (41%) and 5 of 95 (5%) tows at the control site; presumably these fat particles did come from the outfall. The particles resemble material seen in the “degradable” fraction of samples (Figure 3) collected by the DITP effluent sampler.

Figure 14 shows the number of times fat particles were observed at the outfall site in each year that marine debris tows were performed. (The one tow in 2008 performed as of this writing did have fat particles present.) There is an increase after 2003 in the proportion of samples where fat particles were observed. It is possible that the increase is the result of the sampling team learning how to look for and identify these particles, which are quite small and easily obscured by the other matter retained in the net.

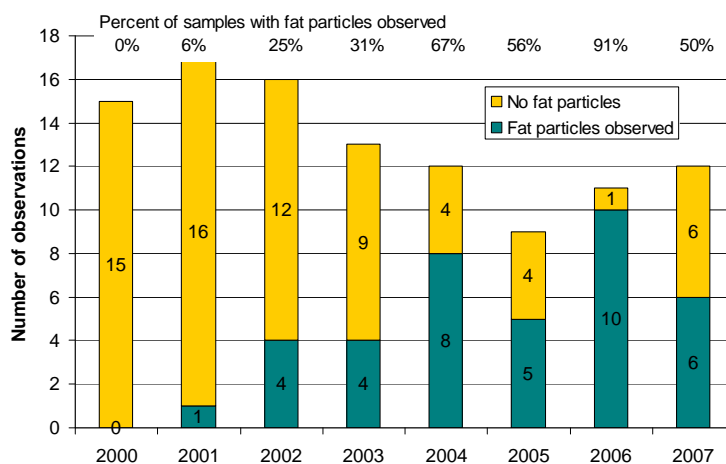


Figure 14. Observations of fat particles in net tow samples at the outfall site, trend over time, 2000-2007.

5.0 Summary

MWRA developed a flow-paced, quantitative method for sampling floatables in DITP effluent which is sensitive and reproducible. The total dry weight of floatables is a good estimator for the amount of both degradable and non-degradable materials in the samples; total floatables are composed of about 86% degradable and 14 % non-degradable material. Floatable materials in final effluent are measured at the parts per billion level: mean volume is 168 ppb, and mean weight is 45 ppb. On average, non-degradable materials are present at 6 ppb by weight. Floatables weight and floatables volume are highly correlated; weight is a stable measure of quantity, and less subject to measurement error than volume. In the effluent sampler floatables of most concern—plastic bags—are rare; condoms and tampon applicators are sometimes found. Most of the non-degradable material is in small pieces. For example, fruit labels and cellophane-type wrappers are consistently present in the sampler. Much of the degradable material is bits of fat and plant matter.

The amount of floatable material increases with increasing flow rates through the plant, which may result from both increased matter in influent (street runoff) and reduced removal efficiency at higher flow rates. However, even at the highest flows, material was present at only <200 ppb by weight. Since 2003, quantities of effluent floatables at DITP have decreased, likely a result of physical improvements to the secondary treatment facilities, including improved tip tubes, and improvements to the biological process.

For fats, oil and grease (FOG) 96% of effluent samples were below the laboratory detection limit; the mean value for FOG was 3.89 mg/L (assuming ½ the detection limit for non-detects) and the maximum weekly mean was 13.6 mg/L. For petroleum hydrocarbons (PHC), 61% of the samples were below the laboratory detection limit; the mean value was 0.165 mg/L (assuming ½ the detection limit for non-detects) and the maximum weekly mean was 0.7 mg/L. These values are well below the Contingency Plan threshold of 15 mg/L weekly average.

“Adverse conditions” such as process upsets and high flows can increase the amount of floatable material in the effluent; nevertheless the amount of floatables in the effluent remained low even during a secondary process upset and periods of extreme high flows due to storms.

These data show that floatable debris (both degradable and non-degradable), FOG, and PHC are found at very low levels in DITP effluent. In particular, materials of concern such as petroleum grease and plastics that are aesthetically offensive or could harm wildlife are rare in the effluent.

Debris tows at both the outfall site and at the control site found plastics and paper that are characteristic of trash discarded from land or boats. Plastic was found in 33% of tows at the outfall site and 24% of tows at the control site; paper was found in 8% of tows at the outfall site and 6% of tows at the control site. Paper or plastic debris characteristic of sewage was not found at either site. However, small fat particles were observed in 37% of tows at the outfall site and 5% of tows at the control site. These particles are similar to the particles observed in effluent samples at the treatment plant, and presumably come from the outfall. The prevalence of observations of fat particles in the outfall tows from 2004 onward is substantially higher than 2000-2003, but it is likely that this is due to improvements in the field crews’ awareness of and ability to see them in the tow samples. Such particles are only rarely directly observed in the environment but must be concentrated in the net tows to be seen, and do not have a significant aesthetic impact.

6.0 Conclusions

Five years of effluent monitoring have shown only very low levels of floatables, measured in the parts per billion range, in final effluent at DITP. More than seven years of field observations and net tows since the outfall came online have found no petroleum grease and no sewage-derived plastics in the waters at the outfall site; we conclude that the outfall is not a source of floatables of concern to the marine environment either aesthetically or to marine life.

Therefore, MWRA recommends that the effluent floatables study be terminated and collection of effluent floatables data ended. MWRA also recommends that no additional effluent Contingency Plan threshold be developed for floatables. Ambient monitoring for floatables would continue as part of the routine water column monitoring, until the ambient monitoring plan is revised as part of the process of renewal of MWRA's NPDES permit.

7.0 References

- Hoagland P, Kite-Powell HL. 1997. **Characterization and Mitigation of Marine Debris in the Gulf of Maine.** Woods Hole Research Consortium Duxbury MA. <http://www.gulfofmaine.org/library/debris/gomdeb.htm#pathways>
- Libby PS, Fitzpatrick M, Buhl R, Lescarbeau G, Leo W, Keller A, Borkman D, Turner J, Oviatt CA. 2008. **Combined work/quality assurance plan for water quality monitoring: 2008-2009.** Boston: Massachusetts Water Resources Authority. Report 2008-02 Version 1. 98 pages
- MWRA. 1997. **Massachusetts Water Resources Authority effluent outfall monitoring plan: Phase II post discharge monitoring.** Boston: Massachusetts Water Resources Authority. Report ms-44. 61 pages.
- MWRA. 1997. November. **Massachusetts Water Resources Authority Contingency Plan.** Boston: Massachusetts Water Resources Authority. 40 pages.
- MWRA 2001. May. **Massachusetts Water Resources Authority Contingency Plan Revision 1.** Boston: Massachusetts Water Resources Authority. Report ms-071. 47 pages.
- MWRA 2003. **Briefing for OMSAP workshop on ambient monitoring revisions March 31-April 1, 2003.** Boston: Massachusetts Water Resources Authority. Report ms-083. 96 pages.
- MWRA. 2004. **Massachusetts Water Resources Authority effluent outfall ambient monitoring plan Revision 1, March 2004.** Boston: Massachusetts Water Resources Authority. Report ms-092. 65 pages.

8.0 Appendix: Data

DITP Floatables Sampling Log (3 pages)

FOG data p.1-13

FOG monthly average p. 14-15

PHC data p. 16-29

PHC monthly average p. 30-31

Photographs of net tow results and raw data for ambient floatables are available on request.

Massachusetts Water Resources Authority
Deer Island Treatment Plant
Floatables Sampling Log

Sampling Event		Flow Conditions					Material Collected from Sampling System						Sampling Points Used			Notes
Start Date/Time	End Date/Time	Time Sampled Days	Plant Flow MGD	Sampling System Flow		Concentration Factor	Inerts	Degradable Grams Dry	Total Weight	Inerts	Degradable ppb Dry	Total	North X if active during event	Mid	South	
				GPM	% Good											
6/18/2002 8:00	7/10/2002 8:00	22.0	319.4	140	0.202	1,584			536.2			32.0	X	X	X	Dry combined weight available only 2ndary system upset during week 2ndary system upset during week
7/12/2002 8:00	7/19/2002 8:00	7.0	278.3	138.4	99.9	0.199	1,397		56.7			10.7				
7/19/2002 8:00	7/26/2002 8:50	7.0	273.0	119.3	99.9	0.172	1,590	22.8	167.0		189.8	5.0	36.5	41.5	X	
7/26/2002 8:50	7/31/2002 8:50	5.0	259.2	122.4	99.9	0.176	1,470	19.5	111.7		131.2	5.8	33.5	39.4	X	
8/2/2002 10:00	8/12/2002 9:00	10.0	258.4	276.9	99.9	0.399	648	12.8	132.0		144.8	0.9	8.8	9.6	X	
8/12/2002 9:00	8/19/2002 9:00	7.0	252.2	267.9	98.3	0.386	654	44.4	892.7		937.1	4.3	87.4	91.7	X	
8/19/2002 9:00	8/26/2002 9:30	7.0	270.7	246.4	99.6	0.355	763	114.9	1,088.1		1,202.9	12.2	115.5	127.7	X	
8/26/2002 9:30	9/3/2002 7:00	7.9	294.8	256.1	100.0	0.369	799	39.4	279.1		318.5	3.6	25.3	28.9	X	
9/3/2002 7:00	9/9/2002 8:10	6.0	281.0	245.8	90.1	0.354	794	13.6	101.5		115.1	1.7	12.5	14.2	X	
9/9/2002 8:10	9/16/2002 8:00	7.0	270.7	217.1	100.0	0.313	866	96.8	425.8		522.6	11.7	51.5	63.2	X	
9/16/2002 8:00	9/23/2002 10:00	7.1	287.7	278.0	100.0	0.400	719	83.6	713.7		797.3	7.8	66.5	74.3	X	

Sampling Event		Flow Conditions					Material Collected from Sampling System						Sampling Points Used			Notes
Start Date/Time	End Date/Time	Time Sampled Days	Plant Flow MGD	Sampling System Flow		Concentration Factor	Total Volume mL	Total Weight g dry	Total Volume ppb by volume	Total Weight ppb by weight	North X if active during event	Mid	South			
				GPM	% Good									MGD		
9/23/2002 10:00	9/27/2002 6:20	3.8	281.8	275.1	100.0	0.396	711			65.0	11.5		X	X	X	Sample separation discontinued- total weight only.; Volume approx. (method under dev.) Volume approx. (method under dev.) 10/16 - significant storm event Unit off for work 7:30 to 10:15 AM 10/25 10/26 - significant storm event 10/28 Sample flow adjusted to ~200gpm 11/12-13 - significant storm event 11/16-18 - extreme storm event 11/20 & 22 - some precipitation Secondary bypass event 12-9-02 Storm 12/11-12, extreme Storm 12/14 Storm- heavy precipitation 12/13 Rain/Snow storm 12/25-26 Pump off 1:00 PM 1/2 Pump on, 9:18 AM 1/3 Rain event 2/1, Melting 2/1-2/4 Rain event 2/22-23, Melting 2/21-2/24 Rain event/melting, 3/2, freeze 3/3 Melting through week, rain event 3/21 Melting through week, blending daily
9/27/2002 6:20	10/7/2002 8:00	10.1	274.0	278.2	96.1	0.401	684	1,300.0	315.7	85.1	20.7	X	X	X	X	
10/7/2002 8:00	10/15/2002 9:30	8.1	269.9	275.4	100.0	0.397	681	550.0	130.9	45.4	10.8	X	X	X	X	
10/15/2002 9:30	10/18/2002 9:30	3.0	353.3	274.6	100.0	0.395	893	1,750.0	351.6	389.7	78.3	X	X	X	X	
10/18/2002 9:30	10/22/2002 6:30	3.9	276.6	272.6	100.0	0.393	704	250.0	59.0	43.4	10.3	X	X	X	X	
10/22/2002 6:30	10/25/2002 7:30	3.0	279.7	271.3	100.0	0.391	716	175.0	37.7	38.9	8.4	X	X	X	X	
10/25/2002 10:15	10/29/2002 8:00	3.9	389.0	263.3	99.9	0.379	1,026	2,850.0	708.9	508.4	126.5	X	X	X	X	
10/29/2002 8:00	11/1/2002 8:30	3.0	296.1	197.9	98.1	0.285	1,039	300.0	45.0	92.1	13.8	X	X	X	X	
11/1/2002 8:30	11/5/2002 11:00	4.1	290.1	189.1	100.0	0.272	1,065	250.0	57.8	59.1	13.7	X	X	X	X	
11/5/2002 11:00	11/12/2002 8:00	6.9	321.4	174.1	100.0	0.251	1,282	1,050.0	254.1	160.9	39.0	X	X	X	X	
11/12/2002 8:00	11/15/2002 8:10	3.0	429.0	194.7	97.5	0.280	1,530	675.0	149.2	211.5	46.8	X	X	X	X	
11/15/2002 8:10	11/19/2002 11:00	4.1	532.2	185.3	99.5	0.267	1,995	1,950.0	442.6	468.9	106.5	X	X	X	X	
11/19/2002 11:00	11/22/2002 10:30	3.0	453.9	198.5	99.6	0.286	1,588	650.0	152.5	201.6	47.3	X	X	X	X	
11/22/2002 10:30	11/27/2002 7:00	4.9	398.2	185.1	100.0	0.266	1,494	500.0	106.8	102.1	21.8	X	X	X	X	
11/27/2002 7:00	12/2/2002 7:00	5.0	348.2	204.0	100.0	0.294	1,185	375.0	119.3	67.4	21.5	X	X	X	X	
12/2/2002 7:00	12/6/2002 7:00	4.0	339.3	204.0	100.0	0.294	1,155	225.0	56.5	50.6	12.7	X	X	X	X	
12/6/2002 7:00	12/10/2002 7:00	4.0	324.0	201.8	100.0	0.291	1,115	650.0	175.6	147.7	39.9	X	X	X	X	
12/10/2002 7:00	12/16/2002 7:30	6.0	517.9	183.1	100.0	0.264	1,964	2,550.0	853.6	424.3	142.1	X	X	X	X	
12/16/2002 7:30	12/20/2002 7:30	4.0	516.1	179.1	100.0	0.258	2,001	1,350.0	364.5	345.6	93.4	X	X	X	X	
12/20/2002 7:30	12/23/2002 7:30	3.0	609.1	157.2	100.0	0.226	2,691	2,000.0	479.4	778.2	186.7	X	X	X	X	
12/23/2002 7:30	12/27/2002 7:30	4.0	475.6	190.9	100.0	0.275	1,730	1,200.0	275.4	288.3	66.2	X	X	X	X	
12/27/2002 7:30	12/31/2002 8:30	4.0	417.6	192.3	100.0	0.277	1,508	200.0	40.0	47.2	9.4	X	X	X	X	
12/31/2002 8:30	1/2/2003 13:00	2.2	512.4	188.2	100.0	0.271	1,891	450.0	85.9	200.6	38.3	X	X	X	X	
1/3/2003 9:18	1/7/2003 9:00	4.0	618.4	199.6	100.0	0.287	2,151	1,650.0	621.9	380.3	143.4	X	X	X	X	
1/31/2003 13:30	2/4/2003 10:45	3.9	357.1	200.5	100.0	0.289	1,237	1,250.0	391.9	294.4	92.4	X	X	X	X	
2/4/2003 10:45	2/7/2003 13:45	3.1	345.0	203.1	100.0	0.292	1,180	200.0	51.0	57.8	14.8	X	X	X	X	
2/21/2003 13:30	2/25/2003 13:30	4.0	533.4	189.8	100.0	0.273	1,952	1,400.0	361.0	338.3	87.3	X	X	X	X	
2/25/2003 13:30	2/28/2003 13:30	3.0	396.4	203.1	100.0	0.292	1,355	200.0	45.4	60.2	13.7	X	X	X	X	
2/28/2003 13:30	3/3/2003 13:00	3.0	460.3	186.7	100.0	0.269	1,713	1,500.0	420.0	494.9	138.7	X	X	X	X	
3/3/2003 13:00	3/6/2003 12:30	3.0	435.9	201.3	100.0	0.290	1,504	575.0	180.7	175.9	55.3	X	X	X	X	
3/6/2003 12:30	3/14/2003 11:30	8.0	413.7	201.8	100.0	0.291	1,423	800.0	254.7	91.4	29.1	X	X	X	X	
3/14/2003 11:30	3/21/2003 10:00	6.9	418.3	201.0	100.0	0.289	1,445	525.0	136.3	69.1	17.9	X	X	X	X	
3/21/2003 10:00	3/28/2003 10:00	7.0	477.9	198.4	100.0	0.286	1,673	625.0	155.1	82.6	20.5	X	X	X	X	

3/29/2006 11:00	4/14/2006 9:00	15.9	287.5	198.1	100.0	0.285	1,008	1,850.0	422.0	107.7	24.6	X	X	X	Time gap due to intermittent down-tim
4/14/2006 9:00	5/12/2006 10:00	28.0	312.0	144.0	100.0	0.207	1,504	1,500.0	327.4	68.1	14.9	X	X	X	
5/12/2006 10:00	5/25/2006 9:30	13.0	771.4	150.2	100.0	0.216	3,567	6,000.0	2,090.4	564.7	196.9	X	X	X	Severe, Prolonged Rainstorm during sample perio
5/25/2006 9:30	6/12/2006 8:30	18.0	591.1	185.0	100.0	0.266	2,219	3,500.0	819.4	193.3	45.3	X	X	X	Heavy rains with flooding 6/7 - 6/10
6/12/2006 8:30	6/26/2006 10:30	14.1	517.8	184.8	100.0	0.266	1,946	1,400.0	317.1	98.7	22.4	X	X	X	Basin#1 down for mixer work
6/26/2006 10:30	7/12/2006 8:15	15.9	381.8	190.1	100.0	0.274	1,394	980.0	200.6	59.4	12.2	X	X	X	
7/12/2006 8:15	7/31/2006 11:00	19.1	346.1	150.5	99.8	0.217	1,598	2,150.0	490.7	137.2	31.3	X	X	X	
7/31/2006 11:00	8/22/2006 12:30	22.1	283.1	173.9	100.0	0.250	1,130	2,050.0	461.8	98.0	22.1	X	X	X	
8/22/2006 12:30	9/6/2006 8:30	14.8	297.2	186.7	100.0	0.269	1,106	625.0	136.1	41.4	9.0	X	X	X	Suspect Reading - drain bypass suspe
9/6/2006 8:30	9/25/2006 10:10	19.1	279.2	182.1	100.0	0.262	1,065	1,500.0	311.7	79.2	16.5	X	X	X	Suspect Reading - drain bypass suspe
9/25/2006 10:10	10/17/2006 10:30	22.0	274.2	181.8	100.0	0.262	1,048	750.0	157.5	34.4	7.2	X	X	X	Suspect Reading - drain bypass suspe
10/17/2006 10:30	11/17/2006 12:00	31.1	347.1	140.3	100.0	0.202	1,719	1,500.0	304.1	63.2	12.8	X	X	X	Suspect Reading - drain bypass suspe
11/17/2006 12:00	12/8/2006 8:30	20.9	439.0	205.9	100.0	0.297	1,480	250.0	53.3	10.7	2.3	X	X	X	Suspect Reading - drain bypass suspe
12/8/2006 8:30	1/5/2007 13:00	28.2	331.2	221.4	100.0	0.319	1,039	900.0	185.2	26.5	5.4	X	X	X	Suspect Reading - drain bypass suspe
1/5/2007 13:00	1/29/2007 9:30	23.9	349.2	180.5	100.0	0.260	1,344	150.0	-42.4	6.4		X	X	X	Sample did not reach screen for unde
1/29/2007 9:30	2/8/2007 10:40	10.0	293.0	197.1	100.0	0.284	1,033	1,100.0	265.2	101.9	24.6	X	X	X	
2/8/2007 10:40	2/23/2007 10:30	15.0	297.6	195.6	100.0	0.282	1,056	2,750.0	706.9	172.0	44.2	X	X	X	
2/23/2007 10:30	3/15/2007 13:00	20.1	357.4	176.8	100.0	0.255	1,404	3,750.0	957.2	193.5	49.4	X	X	X	
3/15/2007 13:00	4/4/2007 6:45	19.7	474.5	164.7	100.0	0.237	2,000	3,250.0	911.9	183.4	51.5	X	X	X	
4/4/2007 6:45	4/24/2007 9:00	20.1	599.4	157.0	100.0	0.226	2,650	3,875.0	940.7	225.3	54.7	X	X	X	
4/24/2007 9:00	5/7/2007 12:00	13.1	468.9	190.0	100.0	0.274	1,714	1,450.0	398.5	106.7	29.3	X	X	X	
5/7/2007 12:00	5/17/2007 11:45	10.0	365.6	183.5	100.0	0.264	1,384	1,500.0	377.1	150.1	37.8	X	X	X	
5/17/2007 11:45	5/29/2007 13:10	12.1	459.7	192.1	98.4	0.277	1,662	2,250.0	554.3	178.2	43.9	X	X	X	
5/29/2007 13:10	6/12/2007 8:15	13.8	366.3	193.9	100.0	0.279	1,312	1,800.0	492.4	123.4	33.8	X	X	X	
6/12/2007 8:15	6/25/2007 10:45	13.1	301.6	196.7	100.0	0.283	1,065	1,300.0	323.5	92.5	23.0	X	X	X	
6/25/2007 10:45	7/16/2007 11:15	21.0	270.6	196.6	100.0	0.283	956	1,650.0	455.2	73.3	20.2	X	X	X	
7/16/2007 11:15	8/8/2007 10:15	23.0	267.4	198.3	100.0	0.285	937	2,400.0	490.8	96.7	19.8	X	X	X	
8/8/2007 10:15	9/28/2007 10:30	11.0	241.5	198.9	100.0	0.286	843	750.0	171.0	63.0	14.4	X	X	X	Pump failure - unit off for approx. 5 we
9/17/2007 11:00	9/28/2007 10:30	11.0	241.5	198.9	100.0	0.286	843	2,200.0	464.0	68.0	14.3	X	X	X	
9/28/2007 10:30	10/30/2007 8:00	31.9	247.7	186.2	100.0	0.268	924	1,000.0	178.4	62.7	11.2	X	X	X	
10/30/2007 8:00	11/16/2007 9:30	17.1	266.5	171.5	100.0	0.247	1,079	1,050.0	207.6	49.9	9.9	X	X	X	
11/16/2007 9:30	12/7/2007 14:00	21.2	253.7	182.1	100.0	0.262	968	1,850.0	424.1	67.3	15.4	X	X	X	
12/7/2007 14:00	1/4/2008 11:30	27.9	333.0	180.8	100.0	0.260	1,279	1,200.0	305.2	59.2	15.1	X	X	X	
1/4/2008 11:30	1/23/2008 11:10	19.0	411.3	196.0	100.0	0.282	1,457	1,500.0	773.5	107.1	55.3	X	X	X	
1/23/2008 11:10	2/6/2008 13:50	14.1	380.8	182.1	100.0	0.262	1,452					X	X	X	
2/6/2008 13:50															

Report Notes:

XX - data entry field
 XX - calculated field
 XX - data automatic from pi

* began volumetric method 10/18 - placed product in volumetric strainer with 2kg compression for 5 min.

FOG data

Facility	Location	Project	Date	Tag	Result	Modified	Units	Component
						Result for <		
DITP	FEFF	NP-EM	9/11/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	9/13/00		15	15	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	9/18/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	10/2/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	10/9/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	10/16/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	10/23/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NPDES	10/30/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	11/6/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	11/8/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	11/13/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	11/21/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	11/27/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	12/4/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	12/6/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	12/11/00	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	12/18/00		10	10	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	12/25/00		11	11	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	1/1/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	1/10/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	1/12/01		13	13	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	1/15/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	1/22/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	1/29/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	2/5/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	2/7/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	2/12/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	2/19/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	2/26/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	3/12/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	3/14/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	3/19/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	3/26/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	4/2/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	4/4/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)
DITP	FEFF	NP-EM	4/9/01	<	7	3.5	MG/L	FATS OIL AND GREASE (AS HEXANE EXTRACTABLE MATERIAL)

FOG data, monthly average, NDs= half detection limit

Average of Modified Result		
Years	Date	Total
2000	Sep	7.33
	Oct	3.50
	Nov	3.50
	Dec	6.30
2001	Jan	5.08
	Feb	3.50
	Mar	3.50
	Apr	3.50
	May	4.56
	Jun	3.50
	Jul	3.50
	Aug	5.40
	Sep	3.50
	Oct	3.50
	Nov	3.50
	Dec	6.42
2002	Jan	4.72
	Feb	3.50
	Mar	3.50
	Apr	7.28
	May	3.50
	Jun	3.50
	Jul	3.50
	Aug	3.50
	Sep	3.50
	Oct	3.50
	Nov	5.40
	Dec	8.98
2003	Jan	3.50
	Feb	3.50
	Mar	3.50
	Apr	3.50
	May	3.50
	Jun	3.50
	Jul	3.50
	Aug	3.50
	Sep	3.50
	Oct	13.60
	Nov	3.50
	Dec	6.92

FOG data, monthly average, NDs= half detection limit

2004	Jan	3.50
	Feb	3.50
	Mar	3.50
	Apr	3.50
	May	3.50
	Jun	3.50
	Jul	3.50
	Aug	3.50
	Sep	3.50
	Oct	3.50
	Nov	3.50
	Dec	3.50
2005	Jan	3.50
	Feb	3.50
	Mar	3.50
	Apr	3.50
	May	3.50
	Jun	3.50
	Jul	3.50
	Aug	3.50
	Sep	3.50
	Oct	3.50
	Nov	3.50
	Dec	3.50
2006	Jan	3.50
	Feb	3.50
	Mar	3.50
	Apr	3.50
	May	3.50
	Jun	3.50
	Jul	3.50
	Aug	3.50
	Sep	3.50
	Oct	3.50
	Nov	3.50
	Dec	3.50
2007	Jan	3.50
	Feb	3.50
	Mar	3.50
	Apr	3.50
	May	3.50
	Jun	3.50
	Jul	2.50
	Aug	2.50
	Sep	2.67
	Oct	2.50
	Nov	2.50
	Dec	3.40
2008	Jan	2.50

PHC data

Facility	Location	Project	Date	Tag	Result	Modified		Component
						Result for <	Units	
DITP	FEFF	NP-EM	9/13/2000		0.12	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/18/2000		0.35	0.35	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/25/2000		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/2/2000	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/5/2000		0.22	0.22	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/9/2000		0.17	0.17	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/16/2000		0.16	0.16	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/23/2000		0.23	0.23	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NPDES	10/30/2000	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/6/2000		0.22	0.22	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/8/2000		0.28	0.28	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/13/2000	<	0.11	0.055	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/21/2000	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/27/2000	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/4/2000		0.55	0.55	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/6/2000		0.19	0.19	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/11/2000		0.26	0.26	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/18/2000		0.32	0.32	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/25/2000	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/1/2001		0.27	0.27	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/10/2001		0.16	0.16	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/12/2001		0.27	0.27	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/15/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/22/2001		0.25	0.25	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/29/2001		0.26	0.26	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/5/2001		0.11	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/7/2001		0.18	0.18	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/12/2001		0.26	0.26	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/19/2001		0.17	0.17	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/26/2001		0.41	0.41	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/12/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/14/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/19/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/26/2001		0.11	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/2/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	4/4/2001		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/9/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/16/2001		0.24	0.24	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/23/2001		0.12	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/30/2001		0.17	0.17	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/7/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/9/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/14/2001		0.35	0.35	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/21/2001		0.31	0.31	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/28/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/4/2001		0.18	0.18	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/6/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/11/2001		0.22	0.22	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/18/2001		0.22	0.22	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/25/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/2/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/10/2001		0.16	0.16	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/11/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/16/2001		0.34	0.34	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/23/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/30/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/6/2001		0.18	0.18	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/8/2001		0.14	0.14	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/13/2001		0.17	0.17	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	CLABQC	8/17/2001		0.34	0.34	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/20/2001		0.15	0.15	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/27/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/3/2001		0.24	0.24	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/10/2001		0.27	0.27	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/12/2001		0.26	0.26	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/17/2001		0.33	0.33	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/24/2001		0.35	0.35	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/3/2001		0.12	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/5/2001		0.14	0.14	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/8/2001		0.3	0.3	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/15/2001		0.11	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/22/2001		0.11	0.11	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	10/29/2001		0.15	0.15	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	CLABQC	11/2/2001		0.12	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/5/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/7/2001		0.28	0.28	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/12/2001		0.18	0.18	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/19/2001		0.18	0.18	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/26/2001		0.2	0.2	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/4/2001		0.19	0.19	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/5/2001		0.22	0.22	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/10/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/17/2001		0.2	0.2	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/24/2001		0.3	0.3	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/31/2001	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/9/2002		0.14	0.14	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/14/2002		0.12	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/15/2002		0.19	0.19	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/21/2002		0.23	0.23	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/28/2002		0.34	0.34	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/4/2002		0.18	0.18	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/6/2002		0.21	0.21	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/11/2002		0.34	0.34	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/18/2002		0.23	0.23	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/25/2002	<	0.11	0.055	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/4/2002		0.2	0.2	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/6/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/11/2002		0.12	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/18/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/25/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/1/2002		0.19	0.19	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	CLABQC	4/4/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/8/2002		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/22/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NPDES	4/26/2002		0.1	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/29/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/6/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/8/2002		0.18	0.18	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/13/2002		0.11	0.11	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	5/20/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/27/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/3/2002		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/5/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/10/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/17/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/24/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/1/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/8/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/10/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/15/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/22/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/29/2002		0.15	0.15	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/5/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/7/2002		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/12/2002		0.15	0.15	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/19/2002		0.2	0.2	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	CLABQC	8/26/2002		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/26/2002		0.14	0.14	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/2/2002		0.14	0.14	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/9/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/11/2002		0.17	0.17	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/16/2002		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/23/2002		0.11	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/30/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/7/2002		0.21	0.21	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/9/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/14/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/21/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/28/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/4/2002		0.12	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/6/2002		0.2	0.2	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/11/2002		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/18/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/25/2002	<	0.11	0.055	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/2/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/4/2002		0.24	0.24	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	12/9/2002		0.14	0.14	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	DISPEC	12/9/2002		1.5	1.5	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/12/2002		0.49	0.49	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/13/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/16/2002		0.22	0.22	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/23/2002	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/30/2002		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/7/2003	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/8/2003		0.12	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/13/2003	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/20/2003	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/27/2003		0.34	0.34	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/4/2003		0.26	0.26	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/5/2003		0.17	0.17	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/10/2003		0.14	0.14	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/17/2003		0.17	0.17	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/24/2003		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/4/2003		0.17	0.17	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/5/2003		0.15	0.15	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/10/2003		0.12	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/17/2003	<	0.11	0.055	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/24/2003		0.17	0.17	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/31/2003		0.13	0.13	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/8/2003	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/9/2003		0.1	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/14/2003	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/21/2003	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/28/2003		0.2	0.2	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/6/2003		0.15	0.15	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/7/2003	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/12/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/19/2003		0.15	0.15	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/26/2003		0.3	0.3	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/4/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/9/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/16/2003	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/23/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	6/30/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/8/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/9/2003	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/14/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/20/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/28/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/5/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/6/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/11/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/18/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/25/2003		0.2	0.2	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/1/2003	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/10/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/11/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/15/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/22/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/29/2003		0.31	0.31	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/7/2003		0.21	0.21	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/8/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/13/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/20/2003	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/27/2003		1.6	1.6	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/4/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/5/2003		0.11	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/10/2003	<	0.22	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/17/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/24/2003	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/1/2003	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/9/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/10/2003		0.36	0.36	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/15/2003		0.66	0.66	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/22/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/29/2003	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/6/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/7/2004	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/12/2004		0.21	0.21	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/19/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	1/26/2004		0.38	0.38	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/3/2004		0.36	0.36	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/4/2004		0.35	0.35	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/9/2004		0.46	0.46	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/16/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/23/2004		0.26	0.26	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/1/2004		0.66	0.66	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/9/2004		0.39	0.39	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/10/2004		0.48	0.48	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/15/2004		1.27	1.27	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/22/2004		1.27	1.27	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/29/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/6/2004	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/7/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/12/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/19/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/26/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/4/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/5/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/10/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/17/2004		0.37	0.37	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/24/2004		0.27	0.27	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/31/2004		0.57	0.57	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/8/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/9/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/14/2004	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/21/2004	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/28/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/5/2004	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/13/2004	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/14/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/19/2004		0.65	0.65	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/26/2004		0.48	0.48	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/3/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/4/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/9/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/16/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	8/23/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/30/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/6/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/14/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/15/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/20/2004		0.42	0.42	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/27/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/6/2004	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/7/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/11/2004	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/18/2004		0.19	0.19	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/25/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/1/2004		0.32	0.32	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/9/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/10/2004		0.23	0.23	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/15/2004		0.38	0.38	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/22/2004		0.29	0.29	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/29/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/7/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/8/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/13/2004	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/20/2004	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/27/2004	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/3/2005	<	0.22	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/11/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/12/2005		0.2	0.2	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/17/2005		0.22	0.22	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/24/2005		0.28	0.28	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/31/2005		0.22	0.22	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/8/2005		0.23	0.23	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/9/2005		0.3	0.3	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/14/2005		0.49	0.49	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/21/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/28/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/8/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/9/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/14/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	3/21/2005		0.32	0.32	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/28/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/5/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/6/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/11/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/18/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/25/2005		0.236	0.236	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/3/2005		0.238	0.238	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/4/2005		0.675	0.675	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/9/2005		0.343	0.343	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/16/2005		0.703	0.703	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/23/2005		0.296	0.296	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/30/2005	<	0.22	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/7/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/8/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/13/2005		0.341	0.341	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/20/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/27/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/4/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/12/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/18/2005		0.22	0.22	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/25/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/1/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/9/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/10/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/15/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/22/2005		0.231	0.231	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/29/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/5/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/13/2005		0.213	0.213	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/14/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/19/2005		0.223	0.223	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/26/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/4/2005		0.252	0.252	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/5/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/10/2005	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/17/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	10/24/2005	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/31/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/8/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/9/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/14/2005		0.566	0.566	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/21/2005		0.248	0.248	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/28/2005		0.237	0.237	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/6/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/7/2005		0.228	0.228	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/12/2005		0.256	0.256	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/19/2005	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/26/2005		0.27	0.27	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/2/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/10/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/11/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/16/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/23/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/30/2006	<	0.22	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/7/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/8/2006		0.706	0.706	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/13/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/20/2006	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/27/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/7/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/8/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/13/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/27/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/4/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/5/2006		0.271	0.271	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/10/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/17/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/24/2006		0.229	0.229	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/1/2006	<	0.22	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/9/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/10/2006		0.227	0.227	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/15/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/22/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	5/29/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/6/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/7/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/12/2006	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/19/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/26/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/3/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/11/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/12/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/17/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/24/2006		0.27	0.27	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/31/2006		0.21	0.21	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/8/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/9/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/14/2006	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/21/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/28/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/4/2006	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/12/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/13/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/18/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/25/2006	<	0.23	0.115	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/3/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/4/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/9/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/16/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/23/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/30/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/6/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/14/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/15/2006	<	0.24	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/20/2006		0.246	0.246	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/27/2006	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/5/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/6/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/11/2006	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/18/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	12/25/2006	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/1/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/9/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/10/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/15/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/22/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/29/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/6/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/7/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/12/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/19/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	2/26/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/7/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/8/2007	<	0.22	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/12/2007	<	0.23	0.115	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/19/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	3/26/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/3/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/4/2007	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/9/2007	<	0.23	0.115	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/16/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/23/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	4/30/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/8/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/9/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/14/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/21/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	SPLITS	5/24/2007		0.322	0.322	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	SPLITS	5/24/2007		0.41	0.41	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	5/28/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/5/2007	<	0.22	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/6/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/11/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/18/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	6/25/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/2/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/10/2007	<	0.24	0.12	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/11/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/16/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/23/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	7/30/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/7/2007	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/8/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/13/2007		0.82	0.82	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	8/27/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/3/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/11/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/12/2007		0.52	0.52	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/17/2007		0.3	0.3	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	9/24/2007		0.23	0.23	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/1/2007		0.91	0.91	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/9/2007		0.2	0.2	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/10/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/15/2007		0.21	0.21	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/22/2007	<	0.1	0.05	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	10/29/2007	<	0.21	0.105	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/6/2007		0.43	0.43	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/7/2007		0.46	0.46	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/12/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/19/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	11/26/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/4/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/5/2007	<	0.2	0.1	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/10/2007		0.41	0.41	MG/L	PETROLEUM HYDROCARBON

PHC data

DITP	FEFF	NP-EM	12/17/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/24/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	12/31/2007	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/8/2008	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/9/2008	<	0.19	0.095	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/14/2008	<	0.22	0.11	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/21/2008	<	0.18	0.09	MG/L	PETROLEUM HYDROCARBON
DITP	FEFF	NP-EM	1/28/2008		0.27	0.27	MG/L	PETROLEUM HYDROCARBON

PHC data monthly average ND = half detection limit

Average of Modified Result		
Years	Date	Total
2000	Sep	0.20
	Oct	0.15
	Nov	0.13
	Dec	0.27
2001	Jan	0.21
	Feb	0.23
	Mar	0.07
	Apr	0.13
	May	0.16
	Jun	0.14
	Jul	0.12
	Aug	0.17
	Sep	0.29
	Oct	0.16
	Nov	0.17
	Dec	0.17
2002	Jan	0.20
	Feb	0.20
	Mar	0.09
	Apr	0.10
	May	0.09
	Jun	0.07
	Jul	0.07
	Aug	0.13
	Sep	0.11
	Oct	0.08
	Nov	0.11
	Dec	0.32
2003	Jan	0.12
	Feb	0.17
	Mar	0.13
	Apr	0.10
	May	0.16
	Jun	0.10
	Jul	0.10
	Aug	0.12
	Sep	0.14
	Oct	0.42
	Nov	0.11
	Dec	0.24

PHC data monthly average ND = half detection limit

2004	Jan	0.18
	Feb	0.31
	Mar	0.70
	Apr	0.10
	May	0.25
	Jun	0.10
	Jul	0.28
	Aug	0.10
	Sep	0.16
	Oct	0.12
	Nov	0.24
	Dec	0.10
2005	Jan	0.19
	Feb	0.24
	Mar	0.14
	Apr	0.13
	May	0.39
	Jun	0.15
	Jul	0.13
	Aug	0.12
	Sep	0.15
	Oct	0.12
	Nov	0.25
	Dec	0.19
2006	Jan	0.10
	Feb	0.22
	Mar	0.10
	Apr	0.16
	May	0.12
	Jun	0.10
	Jul	0.15
	Aug	0.10
	Sep	0.10
	Oct	0.10
	Nov	0.13
	Dec	0.10
2007	Jan	0.10
	Feb	0.10
	Mar	0.10
	Apr	0.10
	May	0.13
	Jun	0.10
	Jul	0.10
	Aug	0.28
	Sep	0.25
	Oct	0.26
	Nov	0.24
	Dec	0.15
2008	Jan	0.13



Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129
(617) 242-6000
<http://www.mwra.state.ma.us>