

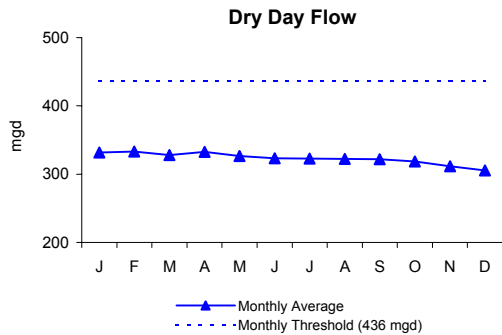
**Massachusetts Water Resources Authority  
Contingency Plan Report on Effluent Monitoring  
Fourth Quarter 2001**

**Deer Island Effluent**

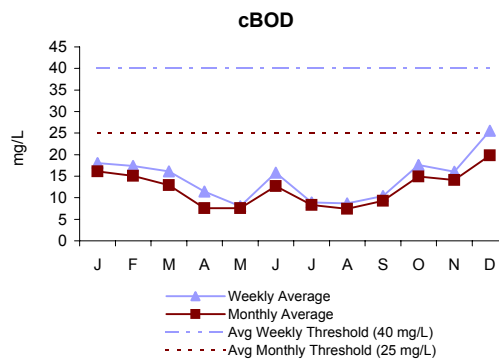
<i>Effluent Characteristics</i>	<i>Units</i>	<i>Threshold</i>	<i>Threshold Exceedence</i>
Dry Day Flow	mgd	436	0
cBOD: Monthly Avg	mg/L	25	0
Weekly Avg	mg/L	40	0
TSS: Monthly Avg	mg/L	30	0
Weekly Avg	mg/L	45	0
TCR: Monthly Avg	ug/L	456	0
Daily Avg	ug/L	631	0
Fecal Coliform	col/100mL	14000	0
pH: Minimum	SU	6.0	0
Maximum	SU	9.0	0
PCB, Aroclors	ug/L	0.000045	0
Total Nitrogen: Caution Level	mtons/year	12500	0
Warning Level	mtons/year	14000	0
Acute Toxicity: Mysid Shrimp	%	50	0
Acute Toxicity: Inland Silverside	%	50	0
Chronic Toxicity: Inland Silverside	%	1.5	0
Chronic Toxicity: Sea Urchin	%	1.5	0
Oil and Grease, Petroleum Origin (Weekly)	mg/L	15	0

1 - Toxicity testing was identified as one of the permit limits which may be difficult to meet prior to the start-up of secondary treatment, including a start-up period of 6 months thereafter.

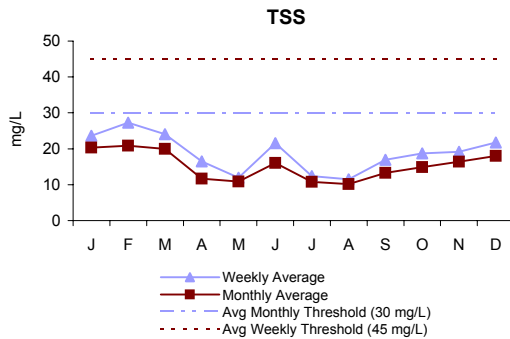
\* - All levels are Warning Levels, unless specified



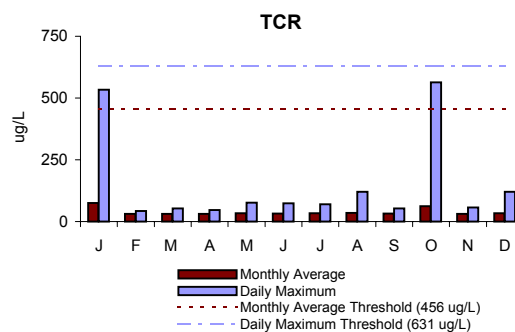
The dry day flow is calculated by averaging influent flow over the previous 365 days during dry weather. A dry day is defined as a day with < 0.09 inches of precipitation and no snow melt. In addition, the precipitation for the previous three days must be less than 0.3, 1.0, and 2.0 inches, respectively.



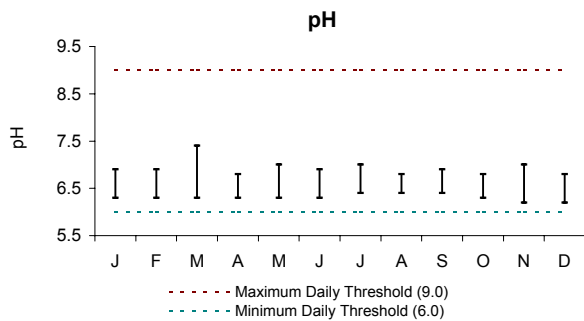
cBOD is a measure of the amount of dissolved oxygen required for the decomposition of organic materials in effluent. The weekly and monthly concentrations for the quarter were below threshold values. The 5-day cBOD removal rate range for the period was 86.2-91.3%.



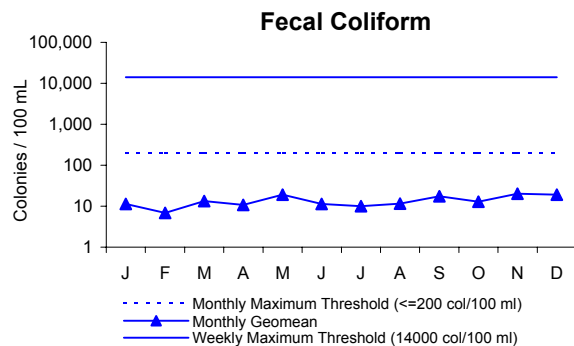
Effluent Total Suspended Solids is a measure of the amount of solids that remain suspended after treatment. The weekly and monthly concentrations for the quarter were below threshold values. The TSS removal rate range for the period was 92.0-93.6%.



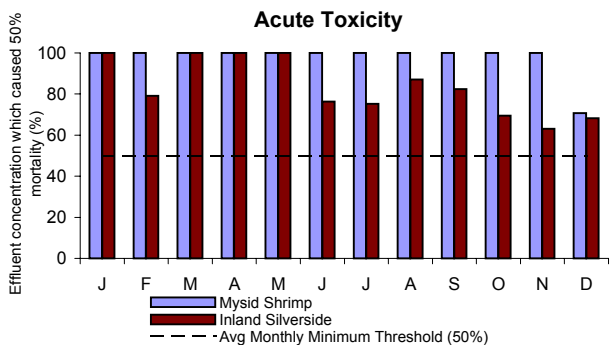
Total Chlorine Residual is the concentration of chlorine allowed in the effluent as it leaves the treatment plant. Chlorine levels will drop off significantly as the effluent travels the length of the outfall.



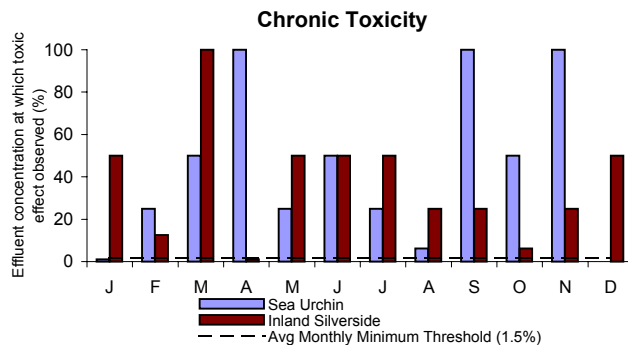
pH is a measure of the alkalinity or acidity of the effluent. Small fluctuations in pH do not have an adverse effect on marine environments, because seawater is well buffered. Secondary treatment technology at Deer Island tends to produce effluent at the low end of the range. All pH measurements were within the threshold range for the quarter.



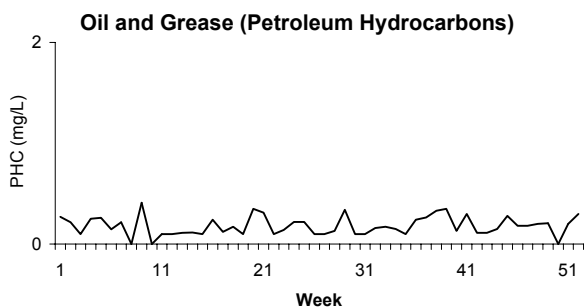
Fecal Coliform is an indicator of the presence of pathogens. The levels of these bacteria after disinfection show how effectively the plant is inactivating disease-causing microorganisms. The Contingency Plan requires that the monthly geometric mean not exceed 14000 col/100ml. The monitoring results for the quarter were well below the threshold value.



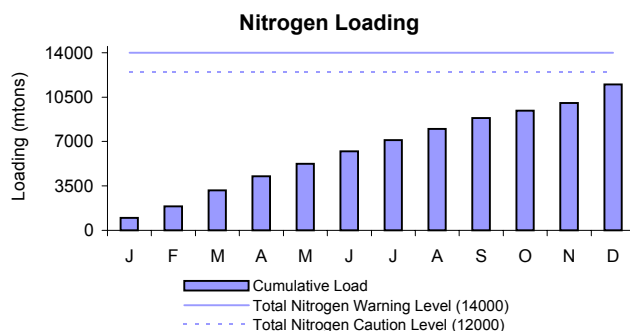
The acute toxicity test simulates the short-term toxic effects of chemicals in sewage effluent on marine animals. The test measures the concentration (percent) of effluent that kills half the test organisms within four days. The higher the concentration of effluent required, the less toxic the effluent. For permit compliance, the effluent concentration that causes mortality to mysid shrimp and inland silverside must be at least 50%. The threshold limits were met for the quarter.



Typically, effects of chronic exposures differ from those of acute exposures. Because of this, chronic toxicity responses are not necessarily related to acute toxicity. The chronic toxicity test simulates the long-term toxic effects of chemicals in sewage effluent on marine animals. To meet permit limits, at least 1.5% effluent must show no observed effect on the growth and reproduction of the test species. The sea urchin and inland silverside results did not meet the minimum threshold limit in January and April, respectively. The sea urchin test could not be conducted in December due to the lack of viable gametes in the test species.



The graph depicts PHC readings well below the Contingency Plan Threshold warning level of 15 mg/L per week. A reason for such low levels is that PHCs are less dense than water and therefore tend to float and adhere to floating materials (scum). Scum collection mechanisms in place at the primary and secondary clarifiers at DITP remove these materials.



Total nitrogen is not regulated under the permit, but the Contingency Plan requires it to be closely monitored because of its potential effects on Massachusetts Bay. Total nitrogen includes total kjeldahl nitrogen, nitrates, and nitrites. The cumulative load for Calendar Year 2001 is below the threshold limits.