

**RESPONSE TO PUBLIC COMMENTS**  
**Templeton Development Center**  
**National Pollutant Discharge Elimination Permit (NPDES) No. MA0102156**

**INTRODUCTION**

In accordance with the provisions of 40 C.F.R. §124.17, this document presents EPA's response to comments (RTC) received on the Draft NPDES Permit (MA0102156). The RTC explains and supports EPA's determinations that form the basis of the Templeton Development Center final Permit. The draft permit public comment period began April 18, 2006, and ended on May 17, 2006. Comments were received from the Riverways Program, Massachusetts Department of Fish and Game.

After a review of the comments, EPA has made a final decision to issue the permit authorizing this discharge. The final permit has changed from the draft permit based on comments received. The new information resulted in changes that are detailed in this document and are reflected in the final permit. A summary of the changes made in the final permit may be found below. The analyses underlying these changes are explained in the responses to individual comments.

**Summary of changes to the final permit:**

- a new maximum day limit of 0.070 mg/l and an average monthly limit of 0.003 mg/l for total lead, with a sampling frequency of quarterly concurrent with the WET tests. See Answer No. 2.
- a new minimum day dissolved oxygen (DO) discharge limit of 6 mg/l with a weekly monitoring frequency. See Answer No. 2.
- a two (2) year schedule to fund, design, and build a mechanism to meet the new effluent DO requirement. See Answer No. 6.
- recommendation (only) that TDC to begin a toxicity identification evaluation (TIE). See Answer No. 9.
- seasonal total phosphorus average monthly loading limits of 0.08 lbs/Day and 0.42 lbs/Day, and a monthly loading reporting requirement for orthophosphorus. As well as a three (3) year set of schedules to construct and implement phosphorus removal. See Answer No. 12.
- a typo correction: the dilution factor shall read 3.3 in footnote 11.

**Comments**

- 1) *The recalculation of the dilution factor using the gage data appears to be a more accurate portend of the likely 7Q10 than the Streamstats calculation. We hope the dilution factor will be revisited when additional gage data is compiled and an even more accurate estimate can be calculated.*

**Answer**

The available dilution is revisited each time the permit is reissued or the permit is modified for water quality based effluent limitations. The most current available gage data will be used at that time to update the dilution factor.

- 2) *Are there other metals in the effluent that might be exacerbating the existing metal impairment, (but does not appear likely to exceed national guidelines)?*

**Answer**

The Region I Protocols for Whole Effluent Toxicity (WET) testing require ancillary metals testing for both the effluent and the upstream test dilution water. The metals sampled are ; total aluminum, total cadmium, total chromium, total copper, total lead, total magnesium, total nickel, and total zinc. All but three metals were consistently well below the criteria concentrations or beneath detection.

The following table is a compilation of recent sampling data for those three metals from the WET reports. The first portion of the table lists acute (CMC) and chronic (CCC) criteria for total copper, total aluminum, and total lead from the Massachusetts Water Quality Standards and the associated calculated limits. The second portion of the table is effluent and ambient concentration data for the three metals.

**Total Copper, Total Aluminum, and Total Lead Criteria and Calculated Limits**

Parameter	Cu CCC	Cu CMC	Al CCC	Al CMC	Pb CCC	Pb CMC
Criteria	0.00354	0.00481	0.087	0.750	0.00075	0.01929
Limit	0.013	0.017	0.3132	2.700	0.0027	0.0695

**Total Copper, Total Aluminum, and Total Lead data from WET Reports**

Date of Report	Copper [mg/l]		Aluminum [mg/l]		Lead [mg/l]	
	Effluent	Ambient	Effluent	Ambient	Effluent	Ambient
4/6/03	0.004	<0.002	0.044	0.16	0.005	<0.005
7/6/03	0.006	0.004	0.02	0.22	0.014	0.014

10/12/03	0.006	<0.002	0.02	0.16	0.018	0.014
1/11/04	0.012	0.003	0.06	0.18	0.010	0.011
4/11/04	<0.002	<0.002	<0.01	0.09	*****	*****
7/5/04	<0.002	<0.002	<0.01	0.09	<0.005	<0.005
1/10/05	<0.002	<0.002	<0.01	0.13	<0.005	<0.005
7/10/05	0.012	<0.002	0.15	0.2	0.007	<0.005
10/9/05	0.007	0.003	0.04	0.24	0.021	0.017
2/21/06	0.016	0.002	0.03	0.06	0.009	0.007
4/10/06	0.009	<0.002	<0.01	0.045 *	**<0.005	<0.005

\* [blank had 0.041]

\*\* Note when effluent is elevated generally so is ambient

Total copper, total aluminum, and total lead are the three metals among those tested that have concentration values at or above the State's ambient Water Quality Criteria. Total copper is addressed in the answer to question number 3.

The effluent total aluminum concentrations exceeded the State's Chronic Criteria only once in 11 samples taken over three years and never exceeded the calculated limit. The ambient concentrations were higher (in some cases considerably higher) than the effluent concentrations and did exceed the chronic water quality criteria. The TDC will continue to monitor for total aluminum with the quarterly WET tests. Some rivers in Massachusetts have naturally occurring high concentrations of aluminum. The appropriate staff at MassDEP have been made aware of the high background concentrations of aluminum in Beaver Brook for consideration of further investigation.

Based on exceedences of the calculated limits for total lead, the final permit will have a maximum day limit of 0.070 mg/l and an average monthly limit of 0.003 mg/l. The sampling frequency shall be quarterly concurrent with the WET tests.

- 3) *Beaver Brook appears on the Massachusetts list of Impaired Waters (303d list) for priority organics, metals and pathogens. The metal(s) of concern are not identified in the list. Is it known if copper is one of the metals impacting this impaired water? Given the metals issue already identified in this waterway, is the quarterly sampling requirement for copper sufficient?*

Answer

See the table of data in Answer number 2. The ambient data for total copper is fairly consistently at or below the analytical minimum level [of detection] of 3 ug/l. The data further reveals only one excursion above the permitted copper limits in the final permit. For a conventional activated sludge treatment plant, the effluent copper concentrations are rather low (below 20 ug/l). Based on available data, copper does not appear to be a major cause of impairment to Beaver Brook. EPA maintains that quarterly copper sampling is sufficient.

- 4) *The Fact Sheet provides information on the potential for toxic pollutants to pose a threat to the receiving water but does not provide units of measure. **Are the copper concentrations listed in mg/l or µg/l?***

Answer

The data in the Fact Sheet Table on Page 8, is in mg/l.

- 5) *Given the threats posed by excessive ammonia concentrations, we would like to **recommend a daily maximum limitation be added to this permit.** An infrequent but significant increase in ammonia concentrations in this cold water fishery could prove detrimental to the aquatic organisms both by causing acute toxicity or by inducing a depression in dissolved oxygen levels in the stream. A monthly averaging could mask the severity of a high ammonia event, a concern given some of the more recent DMR data indicating significant ammonia monthly average exceedances during the summer of 2004 just when an aquatic system is typically at its most stressed and susceptible to DO depression.*

Answer

The acute ammonia criteria multiplied by the dilution factor of 3.6 yields a concentration of 63 mg/l (see permit fact sheet Page 10) which would be the maximum daily limit. Based on data provided by the permittee there does not appear to be reasonable potential for an exceedence of the in-stream acute water quality criteria. Absent reasonable potential, no maximum daily total ammonia limit shall be added to the final permit.

- 6) *Native cold water aquatic assemblages rely on cool, clean, running waters. **Has any consideration been given to require dissolved oxygen [DO] monitoring of the effluent to ensure the receiving water remains well oxygenated throughout the summer season?***

Answer

The permittee currently monitors the effluent dissolved oxygen (DO) and reports the data to the MassDEP. A review of effluent DO data shows sample results at times approaching 1 mg/l, which given the low dilution factor establishes that the discharge has a reasonable potential to contribute a violation of the in-stream DO criteria of 6 mg/l. The final permit includes a minimum daily DO discharge limit of 6 mg/l, based on the in-stream water quality criteria. The permittee shall be required to monitor the effluent DO once per week. Effluent sampling shall be required at the end of the UV disinfection tank. This sampling location may be relocated depending upon possible alterations made at the treatment plant to meet the new DO limitation. There may be turbulence induced DO introduced after the UV contact chamber. The permittee might wish to explore this possibility by sampling for DO at an access point (manhole) located about 100 yards from the plant. The manhole is not currently used as a sampling point as it is a confined space necessitating special entry procedures. The final permit shall include a two (2) year schedule to fund, design, and build a mechanism to meet the effluent DO requirement as permitted under 40 CFR §122.47 and 314 CMR 3.10(10).

- 7) *Has there been any investigation of the thermal impacts of this discharge on the receiving water given the meager dilution factor of this discharge?*

Answer

The permittee monitors the influent temperature and reports the data to the state. The 12-18 hour detention time at the plant is brief enough so as to not significantly alter the treated wastewater temperature prior to discharge. The effluent is unlikely to raise the in-stream temperature during critical periods. The final permit shall not require effluent temperature monitoring.

- 8) *The draft permit will retain the  $\geq 30\%$  chronic C-NOEC requirement though, under the recalculated dilution factor, there would be a slight lowering of the percent effluent used in the testing. **We support maintaining the existing  $\geq 30\%$  and would even urge an expansion of the Whole Effluent Toxicity testing requirements based on past performance.***

Answer

Rather than require an expansion of the current WET testing requirements, EPA shall advise the TDC to work with their contract laboratory to identify the toxicant at the time(s) when acute toxicity is observed. Once the toxicant(s) is identified the permittee may work to identify and eliminate the source. This matter has been identified to our Water Technical Unit who will follow the TDC's progress.

- 9) *The MA Department of Environmental Protection's (DEP) most recent watershed assessment report notes the facility's chronic toxicity failures suggest acute not chronic failure since problems seemed to occur after the initial test waters were replenished- not a cumulative impact over the course of the test. This acute toxicity during the chronic test is doubly disquieting because the chronic testing uses only 30% effluent and 70% make-up water. DEP has interpreted these findings as indicative of acute toxicity issues and it may be best to add another test species to determine if Ceriodaphnia dubia are the most sensitive species. Since this water body can support salmonids, a species within this genus might be a suitable test organism,*

Answer

EPA encourages the TDC to begin a toxicity identification evaluation (TIE) which is generally done in conjunction with the permittee's chosen WET testing laboratory. Where evidence of toxicity is already apparent, a TIE will identify the specific toxicant(s) present in the effluent so they may be removed. This is more effective than broadening the scope of WET testing by adding additional species. While EPA encourages the permittee to begin this process voluntarily, EPA and MassDEP have the option of requiring a TIE through enforcement against WET violations or the provision in the permit that states, *the permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.* EPA recommends the following as guidance, Methods for Aquatic Toxicity Identification Evaluations Phase I Toxicity Characterization Procedures, United States Office of Environmental Protection Agency Research and Development Washington, DC 20460 EPA/600/6-9 1/003 February 1991

- 10) *The Templeton Development School is a state-run school and this suggests there may be seasonal reductions in the population at this facility. **If there is a seasonality to the population and the effluent flows, it would be worth reconsidering the WET testing schedule. The current schedule is unlikely to capture the low flow conditions in this stream and may have a sampling date that occurs during a summer reduction in population at the school.** Is the schedule in the draft permit based on specific target conditions?*

Answer

The Templeton Development Center has a stable year-round population with very little fluctuation according to TDC staff. The variation in effluent flows do not follow a consistent pattern and so historical flow data is not a sound predictor for future effluent low flow periods. The MassDEP has a schedule for WET testing determined by watershed. MassDEP has discovered that there is value in having all WET tests for a particular watershed done during a concurrent period. The final permit shall retain the current WET schedule.

- 11) *We are very pleased to see phosphorus limitations added to this permit. As already noted, the receiving water is a coldwater fishery capable of supporting native salmonids. In addition to cold water conditions, these species are relatively pollution intolerant. Reducing the nutrient load into this stream is an important component to keep the water quality of Beaver Brook to a level capable of supporting a native cold water fishery. The Fact Sheet presented estimates of the receiving water phosphorus concentration if the Templeton Development Center maintains a 0.2 mg/l concentration. This calculation, which assumed no background phosphorus, indicated the 0.2 mg/l phosphorus concentration permit limit would not be adequate to meet the recommended concentrations in the EPA Ecoregional guidance but it would meet best technically achievable level. Since there is currently no Massachusetts water quality numerical standard for nutrients, the permit is relying on the highest and best practicable treatment concentration for this permit despite concerns about meeting Ecoregion guidance and water quality goals. **If 0.2 mg/l is the highest and best practicable treatment concentration than we would like to strongly recommend the 0.2 mg/l concentration also be required as the daily maximum and that load limitations also be added to the permit.** This option may not be as desirable as assigning a concentration limitation likely to achieve the Ecoregional recommended goals but it will require the facility to consistently meet practicably achievable goals and keep phosphorus concentrations and loads to the technically feasible lowest level throughout the growing season.*

Answer

EPA does not have background total phosphorus (TP) data for the Beaver Brook in proximity to the discharge. There are no other permitted dischargers on the Beaver Brook. With the available dilution, the discharge limitation of 0.2 mg/l will allow for some naturally occurring ‘background’ TP and still achieve the in-stream Gold Book criteria.

- 12) *We note the draft permit mentions the loading values of orthophosphate in footnote number 6 but there is no dedicated report requirement for loads listed in the permit limitation chart on page 3.*

Answer

The final permit shall include a reporting requirement in pounds per day for orthophosphate loading limits as well as loading limits for average monthly total phosphorus which are calculated as follows:

(concentration limit (mg/l))(design flow (MGD))(conversion (8.34)) =  
(loading limit (lbs/Day))

(0.2 mg/l)(0.05 MGD)(8.34) = 0.08 lbs/Day Average Monthly Limit  
(1.0 mg/l)(0.05 MGD)(8.34) = 0.42 lbs/Day Maximum Daily Limit

The loading sampling frequency shall be the same as for the phosphorus concentration monitoring.

EPA acknowledges that The permittee will need time to design, construct, and implement phosphorus removal capabilities. The final permit includes a schedule of no later than three years from the effective date of the permit for TDC to achieve compliance with the limits for total phosphorus.

- 13) *As noted above, a summer monitoring may not be representative of the effluent if Templeton Development Center experiences seasonal population shifts. If there is a lowering of population and activity in the summer than the January and August sampling schedule for nitrate-nitrogen, nitrite-nitrogen and Total Kjeldahl nitrogen may not adequately capture the information concerning nitrogen loadings as we presuppose this measure is intended to do.*

Answer

The Templeton Development Center has a stable year-round population with very little fluctuation, therefore, any minor changes in loading are not due to seasonal population changes. The final permit shall retain the January and August sampling periods to represent nitrogen loads during both warm and cold weather plant operations.

- 14) *There is a minor typographical error in footnote number 11 where the dilution factor is listed as 6 instead of 3.6.*

Answer

The dilution factor calculated for this draft permit is 3.6. The chronic no observable effects concentration (C-NOEC) is carried forward from the previous permit based on anti-degradation provisions found in the CWA. The dilution used in the previous permit to derive the C-NOEC of  $\geq 30\%$  was 3.3. The dilution factor shall read 3.3 in footnote 11 in the final permit.