## 4.3 Whole Effluent Toxicity (WET)

Chronic WET test measures the effect of wastewater on indicator organisms' growth, reproduction and survival. Effluent toxicity is predicted when the No Observable Effect Concentrations (NOEC) for a test organism is less than the facility's Instream Wastewater Concentration (IWC). WET testing also requires a measure of test sensitivity known as the Percent Minimum Significant Difference (PMSD). See Table below from Section 10.2.8.3 (page 52) of EPA 821-R-02-013 *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, 4th Edition, 2002 for PMSD variability criteria.

TABLE 6. VARIABILITY CRITERIA (UPPER AND LOWER PMSD BOUNDS) FOR SUBLETHAL HYPOTHESIS TESTING ENDPOINTS SUBMITTED UNDER NPDES PERMITS.[1]

| Test Method | Endpoint | Lower PMSD Bound | Upper PMSD Bound |
|---|---|---|---|
| Method 1000.0, Fathead Minnow Larval Survival and Growth Test | growth | 12 | 30 |
| Method 1002.0, *Ceriodaphnia dubia* Survival and Reproduction Test | reproduction | 13 | 47 |
| Method 1003.0, *Selenastrum capricornutum* Growth Test | growth | 9.1 | 29 |

[1] Lower and upper PMSD bounds were determined from the 10th and 90th percentile, respectively, of PMSD data from EPA's WET Interlaboratory Variability Study (USEPA, 2001a; USEPA, 2001b).

PMSD must be calculated for each species tested as follows:

$$\text{PMSD} = \frac{\text{Minimum Significant Data (MSD)}}{\text{Control Mean}} \text{ x } 100\ \%$$

The effluent from the New River WPCP will not be considered toxic if the No Observed Effect Concentration (NOEC) is greater than or equal to the Instream Wastewater Concentration (IWC) of 100%. If results of the WET tests predict toxicity or are invalid, then the permittee may be required to perform additional WET tests, or the permit may be modified to include chronic WET effluent limitations.

The permittee submitted the results of 8 WET tests with the application. For all tests, the NOEC for the *Ceriodaphnia dubia* survival and reproduction and the *Pimephales promelas* survival and growth were equal to the IWC of 100%; therefore, effluent is not considered toxic. Refer to WET Test results summary in the table below.