Reasonable Potential Analyzer

Facility Name   City of Las Vegas

NPDES Permit Number   NM0028827   Outfall Number   001

Proposed Critical Dilution*   87   Appendix A

*Critical Dilution in draft permit, do not use % sign.

Enter data in yellow shaded cells only. Fifty percent should be entered as 50, not 50%.

Test Data

Date (mm/yyyy)	VERTEBRATE Lethal NOEC	Sublethal NOEC	Lethal TU	Sublethal TU	INVERTEBRATE Lethal NOEC	Sublethal NOEC	Lethal TU	Sublethal TU
Mar-06	89	89	1.12	1.12	89	89	1.12	1.12
Jun-06	89	89	1.12	1.12	89	89	1.12	1.12
Sep-06	89	89	1.12	1.12	89	89	1.12	1.12
Dec-06	89	89	1.12	1.12	89	89	1.12	1.12
Mar-07	89	89	1.12	1.12	89	89	1.12	1.12
Jun-07	89	89	1.12	1.12	89	89	1.12	1.12
Sep-07	89	89	1.12	1.12	89	89	1.12	1.12
Dec-07	89	89	1.12	1.12	89	89	1.12	1.12
Feb-08	89	89	1.12	1.12	89	89	1.12	1.12
May-08	89	89	1.12	1.12	89	89	1.12	1.12
Sep-08	67	28	1.49	3.57	89	89	1.12	1.12
Oct-08	89	89	1.12	1.12				
Nov-08	89	89	1.12	1.12				
Dec-08	89	89	1.12	1.12	89	89	1.12	1.12
Mar-09	89	89	1.12	1.12	89	89	1.12	1.12
Jun-09	89	67	1.12	1.49	89	89	1.12	1.12
Sep-09	89	89	1.12	1.12	89	89	1.12	1.12
Dec-09	89	89	1.12	1.12	89	89	1.12	1.12
Feb-10	89	89	1.12	1.12	89	89	1.12	1.12
May-10	89	89	1.12	1.12	89	89	1.12	1.12
Aug-10	89	89	1.12	1.12	89	89	1.12	1.12
Nov-10	89	89	1.12	1.12	89	89	1.12	1.12
Mar-11	89	89	1.12	1.12	89	89	1.12	1.12
	67	28	1.49	3.57	89	89	1.12	1.12
Count			23	23			21	21
Mean			1.140	1.246			1.124	1.124
Std. Dev.			0.077	0.513			0.000	0.000
CV			0.1	0.4			0	0
RPMF			1.1	1.2				

                   1.149 Reasonable Potential Acceptance Criteria

Vertebrate Lethal   1.428   Reasonable Potential exists, Permit requires WET monitoring and WET limit.

Vertebrate Sublethal   3.729   Reasonable Potential exists, Permit requires WET monitoring and WET limit.

Invertebrate Lethal

                                      No Reasonable Potential exists. Permit requires WET monitoring, but no WET limit.

Invertebrate Sublethal

                                      No Reasonable Potential exists. Permit requires WET monitoring, but no WET limit.

According to the EPA Reasonable Potential Analyzer (Appendix A) the facility has demonstrated exceedances of the State WQS for the *Pimephales promelas* test species. However, in 2005, a TRE was performed that identified ammonia as the cause of toxicity. Ammonia was subsequently limited in the previous permit in lieu of WET limits as indicated under 40 CFR 122.44 (d) (1)(v). EPA notes that the failure for *Pimephales promelas* in September of 2008 coincides with the facility's failure to meet ammonia limits set in the previous permit term after the TRE was performed. Since *Pimephales promelas* is more sensitive to ammonia than *Ceriodaphnia dubia*, EPA finds this failure to be due to ammonia. Another sublethal failure occurred in June 2009 but occurred at a dilution series point near the new critical dilution. EPA believes that toxicity is non-existent or averted via the ammonia limit maintained in the permit but will still remove the facility's option for a reduction in monitoring frequency.

Reasonable Potential Analyzer

Determining "Reasonable Potential" for Excursions Above Ambient Criteria Using Effluent Data Only

EPA recommends finding that a permittee has "reasonable potential" to exceed a receiving water quality standard if it cannot be demonstrated with a high confidence level that the upper bound of the lognormal distribution of effluent concentrations is below the receiving water criteria at specified low-flow conditions.

Step 1 Determine the number of total observations ("n") for a particular set of effluent data (concentration or toxic units [TUs]), and determine the highest value from that data set.

Step 2 Determine the coefficient of variation for the data set. For a data set where n<10, the coefficient of variation (CV) is estimated to equal 0.6, or the CV is calculated from data obtained from a discharger. For a data set where n>0, the CV is calculate as standard deviation/mean. For less than 10 items of data, the uncertainty in the CV is too large to calculate a standard deviation or mean with sufficient confidence.

Step 3 Determine the appropriate ratio from the table below.

Step 4 Multiply the highest value from a data set by the value from the table below. Use this value with the appropriate dilution to project a maximum receiving water concentration (RWC).

Step 5 Compare the projected maximum RWC to the applicable standard (criteria maximum concentration, criteria continuous concentration [CCC], or reference ambient concentration). EPA recommends that permitting authorities find reasonable potential when the projected RWC is greater than an ambient criterion.

key1	10	11	12	13	14	15	16	17	18	19	20
0.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
0.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1
0.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2
0.4	1.5	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.2
0.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4	1.3	1.3	1.3
0.6	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.4
0.7	1.9	1.8	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.5	1.4
0.8	2	1.9	1.9	1.8	1.7	1.7	1.6	1.6	1.6	1.5	1.5
0.9	2.2	2.1	2	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.5
1	2.3	2.2	2.1	2	1.9	1.8	1.8	1.7	1.7	1.6	1.6
1.1	2.4	2.3	2.2	2.1	2	1.9	1.9	1.8	1.7	1.7	1.7
1.2	2.6	2.4	2.3	2.2	2.1	2	1.9	1.9	1.8	1.8	1.7
1.3	2.7	2.5	2.4	2.3	2.2	2.1	2	1.9	1.9	1.8	1.8
1.4	2.8	2.7	2.5	2.4	2.3	2.2	2.1	2	1.9	1.9	1.8
1.5	3	2.8	2.6	2.5	2.3	2.2	2.1	2	2	1.9	1.8
1.6	3.1	2.9	2.7	2.5	2.4	2.3	2.2	2.1	2	2	1.9
1.7	3.2	3	2.8	2.6	2.5	2.4	2.3	2.2	2.1	2	1.9
1.8	3.3	3.1	2.9	2.7	2.6	2.4	2.3	2.2	2.1	2	2
1.9	3.4	3.2	3	2.8	2.6	2.5	2.4	2.3	2.2	2.1	2
2	3.6	3.3	3	2.9	2.7	2.5	2.4	2.3	2.2	2.1	2