

El Dorado Chemical Co. Whole Effluent Toxicity Analysis

The following is a summary of the findings after reviewing the preliminary draft permit, fact sheet, and supporting documents for El Dorado Chemical Co. (EDCC), NPDES Permit No. AR0000752, the 2000 State of Arkansas Continuing Planning Process (2000 CPP), the 2014 Arkansas Pollution Control and Ecology Commission Regulation No.2 (2014 Reg.2), and the 1991 EPA's Technical Support Document for Water Quality-Based Toxics Control (1991 TSD).

Outfall 001

The previous permit established chronic WET testing requirements and data from the last permit cycle indicates there were 68 chronic tests conducted with *Pimephales promelas* (*P.promelas*), in which 12 tests failed. There were 65 chronic tests conducted with *Ceriodaphnia dubia* (*C.dubia*), in which 43 tests failed. The permit describes the WET testing requirement for this outfall as 48-hr acute testing when the discharge lasts less than 5 days and 7-day chronic testing when the discharge lasts over 5 days. Under the Regulation No.2, Part 2.409 (2014), "Discharges shall not be allowed into any waterbody which after consideration of the zone of initial dilution, mixing zone and critical flow conditions, will cause toxicity". Under Regulation 2.508, "Permitting of all toxic substances shall be in accordance with the toxic implementation strategy found in the State of Arkansas Continuing Planning Process". According to the 2000 CPP, Appendix D, Part III.A, "If a facility discharges to a large stream (7Q10>100cfs) and background flow to effluent flow is greater than 100:1 (7Q10: Qd>100), acute biomonitoring is required. In all other cases, chronic testing is required". The 7Q10 for outfall 001 is 0cfs and background flow is less than 100:1. WET test data for outfall 001 demonstrates the reasonable potential for chronic toxicity in this effluent, and the limits proposed in the permit for lethal and sublethal toxicity are appropriate. An acute test will not analyze sublethal toxicity, therefore, chronic testing with limits on both species is the only appropriate WET test requirement for this outfall. In the case that a discharge has a short duration, the permit (Part II.11.2.d.iv) indicates that the minimum number of effluent samples for the chronic test and the holding time is waived. The permittee must collect sufficient sample volume to complete the required test with daily renewal. This ensures a chronic test can be completed by the permittee even when discharges are of short duration.

Outfall 002

The 7Q10 for outfall 001 is <100cfs and background flow is less than 100:1, however, the testing requirement proposed for this outfall is acute testing. This test is not consistent with the 2000 CPP, Appendix D, Part III.A. The previous permit required acute testing for this outfall and data indicates reasonable potential for *D. pulex*. Acute testing requirements and the limit for *D.pulex* may remain in this permit but chronic biomonitoring must be a requirement for this outfall, using *C.dubia* and *P.promelas*.

Outfall 006 and Outfall 007

The 7Q10 for both outfalls is <100cfs and background flows are less than 100:1, however, the testing requirement proposed for both outfalls is acute testing. This test is not consistent with the 2000 CPP, Appendix D, Part III.A.

In June 1999, EDCC had requested acute toxicity testing instead of chronic toxicity testing. A Permit Appeal Resolution signed on June 5th, 2003 by ADEQ and EDCC indicated under Order and Agreement, Part 1(g), that acute testing (monitoring and reporting) instead of chronic testing would be the requirement until a watershed analysis was completed and a permit modification resulting from such analysis became effective. The watershed analysis was completed by EDCC and the 7Q10 for both outfalls is <100cfs and background flows are less than 100:1. Chronic testing should be the requirement for both outfalls. Additionally, the permittee's critical dilution in the draft permit is 22% effluent at outfall 006 and 50% effluent at outfall 007, even though the acute toxicity formula found in the 2000 CPP for calculating a critical dilution was used. According to EPA Guidance (1991 TSD, Part 1.3.4) an acute to chronic ratio of 10:1 should provide ample protection against chronic instream impacts, although the chronic toxicity formula found in the 2000 CPP should be used in calculating the critical dilution for 006 and 007 before extrapolating to an acute critical dilution.

The previous permit established acute 48hr WET testing requirements and data from the last permit cycle for outfall 006 indicates there were 49 acute tests conducted with *P.prom*, in which 9 tests failed (2 failed at the new proposed critical dilution) . There were 49 acute tests conducted with *D. pulex*, in which 15 tests failed (6 failed at the new proposed critical dilution). No limits are proposed for outfall 006, even though according to the 2000 CPP, Appendix D, Part III.F, the demonstration of significant toxic effects in two toxicity tests demonstrates reasonable potential for WET. Therefore, limits are warranted. Acute testing requirements may remain in this permit, with a limit for both *D.pulex* and *P.prom*, but chronic biomonitoring must be a requirement for this outfall, using *C.dubia* and *P.promelas*.

Data from outfall 007 indicates there were 55 acute tests conducted with *P.prom*, in which 36 tests failed (23 failed at the new proposed critical dilution). There were 55 acute tests conducted with *D. pulex*, in which 40 tests failed (32 failed at the new proposed critical dilution). Acute testing requirements may remain in this permit, with a limit for both *D.pulex* and *P.prom* as proposed in the permit, but chronic biomonitoring must be a requirement for this outfall, using *C.dubia* and *P.promelas*.