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M E M O R A N D U M

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SUBJECT: THE QUALIFICATION OF METHOD EMON-SM-05-040 AS UNEQUIVOCAL ACCORDING TO CRITERIA IN THE PESTICIDE CONTAMINATION PREVENTION ACT

BACKGROUND

The Pesticide Contamination Prevention Act (Food and Agricultural Code [FAC] sections 13141 et seq.) was passed in 1985 to prevent further pesticide pollution of ground water which may be used for drinking water supplies. FAC section 13149 specifies the conditions under which a pesticide is considered "found" in ground water or soil, and thus subject to formal review as specified. FAC subsection 13149(d) allows a finding of a pesticide in ground water or soil to be based on a single analytical method conducted by a single analytical laboratory, only if the analytical method provides unequivocal identification of a chemical. Criteria to identify methods providing unequivocal identification of a chemical are included in a DPR memo entitled "Evaluating analytical methods for compliance with the Pesticide Contamination Prevention Act Requirements" (Aggarwal, 2012).

PURPOSE

Determine if the analytical method (EMON-SM-05-040) for Dacthal, Dacthal monoacid, and Dacthal diacid in well water used by the California Department of Food and Agriculture (CDFA) meets the definition of an unequivocal detection method.

DISCUSSION AND RECOMMENDATION

CDFA Center for Analytical Chemistry method (EMON-SM-05-040) uses a gas chromatograph equipped with a mass selective detector (GC/MSD) for the detection of Dacthal and its metabolites (Dacthal monoacid and Dacthal diacid) in well water. Prior to injection of sample into the GC/MSD, ground water sample is acidified with sulfuric acid (H_2SO_4) and passed through a HLB solid phase extraction (SPE) cartridge. The column is then rinsed with 0.18 M H_2SO_4, followed by eluting the analytes with diethyl ether (Et_2O), and concentrating the extract to ~ 1-2 mL. This concentrated extract is then treated with diazoethane followed by evaporation

to dryness. The dried extract is reconstituted with 0.1 mL acetone followed by 0.9 mL of iso-octane, and then analyzed by a GC/MSD.

In CDFA method EMON-SM-05-040 for Dacthal, Dacthal monoacid, and Dacthal diacid, the MSD is run in selected ion monitoring mode looking only for selected molecular ion mass and specific daughter ion masses at specific retention times.

In CDFA method EMON-SM-05-040, the following criteria are used to confirm the presence of Dacthal, Dacthal monoacid, and Dacthal diacid in well water:

1. Each set of samples will have a matrix blank and a spiked matrix sample.
2. The retention time should be within ± 2 percent of that of the standards.
3. The recoveries of the matrix spikes shall be within the control limits.
4. The sample must be diluted if results exceed the calibration curve.
5. The standard curves at the beginning and end of each sample set should have a percentage change less than 20%.
6. The R^2 of each calibration curve should be equal to or greater than 0.990.
7. Chemist may report the average of two injections when the above criteria are met.

Analysis of Dacthal, Dacthal monoacid, and Dacthal diacid by method EMON-SM-05-040 is highly specific and qualifies for unequivocal detection designation. Therefore, analysis by a second laboratory or a second method is not necessary for well water samples analyzed for Dacthal, Dacthal monoacid, and Dacthal diacid by this method.

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REFERENCES

Aggarwal, V. 2012. Memorandum to Lisa Ross, Ph.D. Evaluating analytical methods for compliance with the Pesticide Contamination Prevention Act requirements. http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/analysis_memos/2391_ross.pdf (accessed 07 September 2017).