

**Department of Pesticide Regulation
Environmental Monitoring Branch
1001 I Street, P.O. Box 4015
Sacramento, California 95812**

May 2019

**STUDY #323: PROTOCOL FOR GROUNDWATER MONITORING AT A FLOOD-
MAR PILOT STUDY SITE NEAR HELM, CALIFORNIA**

I. INTRODUCTION

The California Department of Pesticide Regulation (DPR) has provided funding to the University of California at Davis to perform a flood-managed aquifer recharge (Flood-MAR) pilot study at the TerraNova Ranch near Helm, California. In addition to other objectives, the study will evaluate the impacts of on-farm recharge using excess surface water supplies on the leaching behavior of agricultural pesticides in the soil root and deep vadose zones underlying the fields where the recharge will be applied. Prior to the application of the surface water for recharge to the cropped fields, agricultural wells on the ranch property in and around the recharge field sites will be sampled by staff from the Groundwater Protection Program (GWPP) of DPR for analysis of various pesticide active ingredients listed in regulation on the Groundwater Protection List (Title 3 of the California Code of Regulations (CCR), sections 6800[a] and 6800[b]) and other active ingredients registered with DPR.

II. PERSONNEL

Well sampling will be conducted by the Environmental Monitoring Branch of DPR, under the general direction of Joy Dias. Project personnel include:

Project Leader/Senior Scientist:	Nels Ruud
Field Coordinator:	Kevin Richardson
Laboratory Liaison:	Sue Peoples
Analytical Chemistry:	Center for Analytical Chemistry, California Department of Food and Agriculture (CDFA)

Please direct questions regarding this study to Nels Ruud at (916) 324-4167, e-mail: <Nels.Ruud@cdpr.ca.gov>.

III. SAMPLING AND ANALYTICAL METHODS

The pre-project round of sampling is planned to occur sometime between late June and late July of 2019. A post-project round of sampling will also be planned at a yet-to-be-determined date in

the future. Fifteen to twenty-five wells are anticipated to be sampled during both the pre- and post-project sampling events. Samples will be collected from the wells using the methods described in SOP FSWA001.02 (Nordmark and Herrig, 2011). Quality assurance samples will be collected in the field following the guidelines described in SOP QAQC001.00 (Segawa, 1995). Groundwater samples collected by GWPP staff will be sent to the California Department of Food and Agriculture (CDFA) Center for Analytical Chemistry for pesticide analysis. Samples collected from each well will be analyzed by the CDFA lab for the following four pesticide screens: 1) EMON-SM-05-032 (CDFA, 2016), 2) EMON-SM-05-037 (CDFA, 2017a), 3) EMON-SM-05-040 (CDFA, 2017b), and 4) EMON-SM-62.9 (CDFA, 2009). Analytical laboratory quality control will be conducted following the guidelines described in SOP QAQC001.00 (Segawa, 1995); although the current version of Assembly Bill (AB) 2021 no longer requires confirmation of detections of a pesticide in at least two discrete well samples nor verification of a pesticide detection by a second analytical method or an approved second analytical laboratory.

IV. DATA ANALYSIS

Results obtained from the CDFA Center for Analytical Chemistry will be used to assess current levels of the analyzed pesticides in the sampled aquifers. Follow up monitoring in areas around wells with pesticide detections will occur according to the Detection Response Process. A report of the results will be prepared. A letter report describing the results will be provided to participating property owners.

V. TIMETABLE

- July 2019 (pre-project) and TBD (post-project): Conduct sampling
- August 2019: Obtain and review analytical results from CDFA laboratory
- September 2019: Review laboratory results and determine if additional sampling is necessary
- December 2019: Prepare report of findings
- Communication
 - Provide notice to the County Agricultural Commissioner prior to initiating monitoring in a county
 - Provide results to property owners within 30 days of receipt
 - Provide results to state and local agencies when sampling is concluded and results have been reviewed and approved by the project team

IX. REFERENCES

- CDFA. 2009. EMON-SM-62.9. Determination of Atrazine, Bromacil, Cyanazine, Diuron, Hexazinone, Metribuzin, Norflurazon, Prometon, Prometryn, Simazine, Deethyl Atrazine (DEA), Deisopropyl Atrazine (ACET), Diamino Chlorotraizine (DACT), Tebuthiuron and the metabolites Tebuthiuron-104, Tebuthiuron-106, Tebuthiuron-107 and Tebuthiuron-108 in Well Water and River Water By Liquid Chromatography- Atmospheric Pressure Chemical Ionization Mass Spectrometry. California Department of Pesticide Regulation, Sacramento, California.
- CDFA. 2016. EMON-SM-05-032. Determination of 44 Pesticides on Well Water by Liquid Chromatography Coupled to Linear Ion Trap Quadrupole and Gas Chromatography Coupled to Triple Quadrupole Mass Spectrometer. California Department of Pesticide Regulation, Sacramento, California.
- CDFA. 2017a. EMON-SM-05-037. Determination of 47 pesticides in Surface Water by Liquid Chromatography Coupled to Linear Ion Trap Quadrupole. California Department of Pesticide Regulation, Sacramento, California.
- CDFA. 2017b. EMON-SM-05-040. Analysis of Dacthal, Dacthal Monoacid, and Dacthal Diacid in Well Water using Gas Chromatography/MSD. California Department of Pesticide Regulation, Sacramento, California.
- Nordmark, C. and J. M. Herrig. 2011. SOP FSWA001.02. Obtaining and Preserving Well Water Samples. Available at: <http://www.cdpr.ca.gov/docs/emon/pubs/sops/fswa00102.pdf> (verified May 20, 2019) California Department of Pesticide Regulation, Sacramento, California.
- Segawa, R. 1995. SOP QAQC001.00. Chemistry Laboratory Quality Control. Available at: <http://www.cdpr.ca.gov/docs/emon/pubs/sops/qaqc001.pdf> (verified May 20, 2019) California Department of Pesticide Regulation, Sacramento, California.