

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

April 2019

**STUDY #326: PROTOCOL FOR STUDY TO TEST EFFECT OF SAMPLE PORT
LOCATION AND PUMP RUN TIME ON INTEGRITY OF GROUNDWATER
SAMPLES**

I. BACKGROUND

DPR groundwater sampling is generally accomplished by collecting water samples from a port prior to a well pressure tank to reduce sample contamination from potential residue accumulation in the tank. The pump is also run for at least ten minutes prior to sample collection to flush the water in the well casing and reduce possible sample contamination from potential residue accumulation in the casing. These procedures ensure the sample is representative of the water in the aquifer. There are instances when a well does not have a sampling port prior to the tank and/or cannot be pumped for ten minutes prior to sampling. This study will test whether well water samples collected after the tank or before the well casing is fully flushed are still representative of the water in the aquifer with respect to residue concentrations.

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:	Murray Clayton
Field Coordinator:	Cindy Garretson
Laboratory Liaison:	Sue Peoples
Analytical Chemistry:	Center for Analytical Chemistry, California Department of Food and Agriculture (CDFA)

Please direct questions regarding this study to Murray Clayton at (916) 324-4095, e-mail: Murray.Clayton@cdpr.ca.gov.

III. SAMPLING AND ANALYTICAL METHODS

Sampling will occur between April and July of 2019. Sixty one wells are anticipated to be sampled. This study will be conducted in conjunction with the Study 228 annual well network sampling.

Objectives

- 1) Test if the sample port location (before the tank vs after tank) affects pesticide residue results
- 2) Test if the amount of time that the pump runs prior to sample collection (at least 10 minutes vs zero minutes) affects pesticide residue results

Method

For 47 wells with previous triazine screen detections

- 1 sample for triazine analysis after the tank and prior to the pump run
- 1 sample for triazine analysis before the tank and immediately upon pump run
- 1 sample for triazine analysis before the tank and after a 10-minute pump run (standard sample)
- 1 sample for triazine analysis after the tank and after a 10-minute pump run

For 5 wells with previous multi-residue screen detections

- 1 sample for multi-residue analysis after the tank and prior to the pump run
- 1 sample for multi-residue analysis before the tank and immediately upon pump run
- 1 sample for multi-residue analysis before the tank and after a 10-minute pump run (standard sample)
- 1 sample for multi-residue analysis after the tank and after a 10-minute pump run

All samples will be collected from the wells using the methods described in SOP FSWA001.02 (Nordmark and Herring, 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 and will be analyzed by the CDFA lab for the following two pesticide screens: EMON-SM-05-032 (CDFA, 2016) and EMON-SM-62.9 (CDFA, 2009). Analytical laboratory quality control will be conducted following the guidelines described in SOP QAQC001.00 (Segawa, 1995).

IV. DATA ANALYSIS

Results obtained from the CDFA Center for Analytical Chemistry will be used to assess current groundwater sampling procedures related to sample port location and pump run time. Paired Student t-tests will be conducted between the standard well water sample collection procedure

(sample collection before the tank and after a 10-minute pump run) with each of the other well water sampling procedures to test for significant differences in residue concentrations.

V. TIMETABLE

- April through July 2019: Conduct sampling
- September 2019: Obtain and review analytical results from CDFA laboratory
- November 2019: Prepare report of findings

IV. 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 Chlorotrazine (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.

Nordmark, C. and J. M. Herrig. 2011. SOP FSWA001.02. Obtaining and Preserving Well Water Samples. California Department of Pesticide Regulation, Sacramento, California.

Segawa, R. 1995. SOP QAQC001.00. Chemistry Laboratory Quality Control. California Department of Pesticide Regulation, Sacramento, California.