USE OF FIELD QUALITY-CONTROL SAMPLES IN DETERMINING THE QUALITY OF PESTICIDE DATA COLLECTED FOR THE USGS NATIONAL WATER-QUALITY ASSESSMENT (NAWQA) PROGRAM

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Biographical Sketch

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Abstract

More than 20,000 water samples from 56 Study Units of the NAWQA Program have been analyzed for pesticides. Field quality-control (QC) samples were used to document the overall quality of the pesticide data because field QC samples measure potential sources of error (from sample collection, processing, and transport) that are not measured by laboratory QC samples. Information from field QC samples is used to (1) identify and correct data-quality problems, (2) provide evidence that data quality is sufficient for the intended use or some future, unanticipated use, (3) adjust environmental data, and (4) qualify interpretations or conclusions.

The NAWQA field QC program emphasizes three types of QC samples: field blanks, field duplicates, and field matrix spikes. Field blanks measure positive bias caused by contamination. Field duplicates measure random variability caused by sample collection, processing, and analysis. Field matrix spikes measure positive or negative bias caused by performance of the analytical method, matrix interference, and analyte degradation. Field QC samples for NAWQA are collected routinely during data collection and in proportion to the number of environmental samples collected.

Estimates of bias and variability measured by field QC samples are used to make inferences about bias and variability in environmental samples. Estimates of the quality of the NAWQA pesticide data will be presented for selected pesticides. Examples of the use of estimates of data quality in water-quality assessments will be presented.