

Appendix E  
Data Quality Evaluation Report

# Data Quality Evaluation

## Phase 1 Sitewide Soil Vapor Investigation Report

### 221 Sunset Drive, Camdenton, Missouri

## Introduction

The objective of this data quality evaluation (DQE) technical memorandum is to assess the quality of analytical results for soil, soil vapor, and groundwater samples collected at 221 Sunset Drive, Camdenton, Missouri. Samples were collected by CH2M HILL Engineers, Inc. (CH2M) September 27 through October 17, 2016. Guidance for the DQE memorandum came from the U.S. Environmental Protection Agency (EPA) *National Functional Guidelines (NFG) for Superfund Organic Methods Data Review, August 2014* and individual method requirements. The analytical results were evaluated using the criteria of precision, accuracy, representativeness, comparability, and completeness (PARCC).

This DQE memorandum is intended as a general data quality assessment designed to summarize data issues.

## Analytical Data

This DQE memorandum covers 47 soil samples, 2 groundwater samples, 27 soil vapor samples, 4 soil field duplicates (FDs), 1 groundwater FD, 3 soil vapor FDs, and 9 trip blanks. The samples were reported as 10 sample delivery groups (SDGs) listed as 122483, 122587, 122842, 122977, Q3107, Q3141, Q3155, Q3221, Q3255, and Q3277. Samples were collected and delivered to CT Laboratories, in Baraboo, Wisconsin, and Applied Sciences Laboratory (ASL), in Corvallis, Oregon. The samples were analyzed by the method listed in Table 1.

**Table 1. Analytical Parameters**

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Parameter	Method	Laboratory
Volatile Organic Compounds	SW-846 8260C	CT Laboratories
Total Organic Carbon (TOC)	Lloyd Kahn	CT Laboratories
Volatile Organic Compounds in Air	TO-15	ASL

The SDGs were assessed by reviewing the following: (1) the chain-of-custody documentation, (2) holding-time compliance, (3) initial and continuing calibration criteria, (4) method blanks and field blanks, (5) laboratory control sample (LCS) recoveries, (6) matrix spike (MS)/matrix spike duplicate (MSD) recoveries, (7) surrogate spike recoveries, (8) internal standard recoveries, (9) FD precision, (10) initial and continuing calibrations, and (11) any other required quality control samples at the specified frequencies.

Data flags were assigned according to the NFGs. Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but there will only be one final flag. A final flag is applied to the data and is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample impacts.

The data flags are listed and defined as follows:

- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- U = The analyte was analyzed for but was not detected above the reported sample quantitation limit.

## Findings

The overall summaries of the data validation are contained in the following subsections. The qualified data are presented in Table 2 at the end of this report.

### Holding Time and Preservation

All acceptance criteria were met.

### Calibration

Initial and continuing calibration analyses were performed as required by the methods. All acceptance criteria were met.

### Method Blanks

Method blanks were analyzed at the required frequency and were free of contamination.

### Field Blanks

Nine trip blanks were collected, analyzed, and were free of contamination.

### Laboratory Control Samples

LCSs were analyzed as required, and all accuracy criteria were met.

### Matrix Spike

MS/MSDs were collected and analyzed as required, and all accuracy and precision criteria were met.

### Surrogates

Surrogates were added as required, and all acceptance criteria were met.

### Internal Standards

Internal standards were added as required, and all acceptance criteria were met, with the following exception:

- One internal standard was recovered greater than the upper control limit in sample MW108S-SV-10-15-101116, indicating a possible high bias. One associated detected result was qualified as estimated and flagged "J". Nondetected results were not flagged.

### Field Duplicates

FDs were collected and analyzed as required, and all precision criteria were met, with the following exceptions:

- Field duplicate pairs SB115D-SO-10-101216 / SB115D-SO-10-101216-FD and SB117S-SO-13-101516 / SB117S-SO-13-101516-FD did not meet precision criteria for TOC. Results were qualified as estimated and flagged "J".

## Chain of Custody

Required procedures were followed, and the document was free of errors.

## Overall Assessment

The goal of the assessment is to demonstrate that a sufficient number of representative samples were collected, and the resulting analytical data can be used to support the decision making process.

The following summary highlights the PARCC findings for the above-defined event:

- Precision of the data was verified through the review of the laboratory data quality indicators that include FD and MS/MSD RPDs. Precision was acceptable with the exception of the four TOC results qualified as estimated J due to field duplicate precision criteria exceedance.
- Accuracy of the data was verified through the review of the calibration data, LCS, MS/MSD, internal standard, and surrogate recoveries, as well as the evaluation of method/field blank data. Accuracy was acceptable with one result being qualified as estimated due to internal standard issues. Data users should consider the impact to any result that is qualified as estimated as it may contain a bias, which could affect the decision making process. The method/field blank samples were free of contamination with no qualification necessary.
- Representativeness of the data was verified through the sample collection, storage, and preservation procedures and the verification of holding-time compliance. All data were reported from analyses within the recommended holding time.
- Comparability of the data was verified using standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

**Table 2. Validation Qualifications**

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Sample	Method	Analyte	Result	Units	Qualifier	Reason Code
MW108S-SV-10-15-101116	TO15	Trichloroethene	5260	µg/m3	J	IS>UCL
SB115D-SO-10-101216	LYDKHN	TOC	38100	mg/kg	J	FD>UCL
SB115D-SO-10-101216-FD	LYDKHN	TOC	20600	mg/kg	J	FD>UCL
SB117S-SO-13-101516	LYDKHN	TOC	57600	mg/kg	J	FD>UCL
SB117S-SO-13-101516-FD	LYDKHN	TOC	29600	mg/kg	J	FD>UCL

**Qualifier Notes**

FD>UCL = Results exceeded field duplicate precision criteria.

IS>UCL = Internal standard compound was recovered above the upper control limit.