**Date**:     July 13, 2016

**To**:      Rob Ede
            Hahn and Associates Inc.

**From**:    Jeanne Peterson
            Sr. Data Validator, AQA

**Subject**:  Data Validation
            Siltronic RI - Doane Creek
            Analytical Resources, Incorporated Job No AYO6 (A6C1076)

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## SUMMARY

Level III data validation was performed on the data for 11 soil samples prepared and analyzed with approved procedures using method SM 4500-S2 D (sulfide).  The samples were submitted to Analytical Resources, Incorporaterd (ARI) for analysis.  Data were reported for all requested analytes.

The analytical data were evaluated in accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (October 1999) and the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (February 1994) (NFG).

In general, most of the data are valid as reported.  No sample data were rejected.  Other qualifiers were applied to the data as specified in the Data Qualifiers section below.

See attached data validation spreadsheets for supporting documentation on the data review and validation.

**SAMPLES**

The samples included in this validation are listed below.

| Sample ID | ARI Laboratory ID | APEX Laboratory ID | Matrix |
|---|---|---|---|
| 5237-160328-DC-SED063 | AYO6A | A6C1076-02 | Soil |
| 5237-160328-DC-SED065 | AYO6B | A6C1076-04 | Soil |
| 5237-160328-DC-SED068 | AYO6C | A6C1076-06 | Soil |
| 5237-160328-DC-SED070 | AYO6D | A6C1076-08 | Soil |
| 5237-160328-DC-SED072 | AYO6E | A6C1076-10 | Soil |
| 5237-160328-DC-SED075 | AYO6F | A6C1076-12 | Soil |
| 5237-160328-DC-SED077 | AYO6G | A6C1076-14 | Soil |
| 5237-160328-DC-SED077D | AYO6H | A6C1076-16 | Soil |
| 5237-160328-DC-SED082 | AYO6I | A6C1076-18 | Soil |
| 5237-160328-DC-SED085 | AYO6J | A6C1076-20 | Soil |
| 5237-160328-DC-SED087 | AYO6K | A6C1076-22 | Soil |

**DATA QUALIFIERS** (see following sections for detailed explanations)

| Sample ID | Analyte | Qualifier | Reason for Qualification |
|---|---|---|---|
| 5237-160328-DC-SED063 | Sulfide | UJ | Low matrix spike recovery |
| 5237-160328-DC-SED065 | Sulfide | UJ | Low matrix spike recovery |
| 5237-160328-DC-SED068 | Sulfide | UJ | Low matrix spike recovery |
| 5237-160328-DC-SED070 | Sulfide | UJ | Low matrix spike recovery |
| 5237-160328-DC-SED072 | Sulfide | UJ | Low matrix spike recovery |
| 5237-160328-DC-SED075 | Sulfide | UJ | Low matrix spike recovery |
| 5237-160328-DC-SED077 | Sulfide | UJ | Low matrix spike recovery |
| 5237-160328-DC-SED077D | Sulfide | UJ | Low matrix spike recovery |
| 5237-160328-DC-SED082 | Sulfide | UJ | Low matrix spike recovery |

| Sample ID | Analyte | Qualifier | Reason for Qualification |
|---|---|---|---|
| 5237-160328-DC-SED085 | Sulfide | J | Low matrix spike recovery |
| 5237-160328-DC-SED087 | Sulfide | J | Low matrix spike recovery |

**DISCUSSION**

**Sample Shipping/Receiving**

All COC, analysis request, and sample receipt documentation was complete and correct.

**Holding Times and Preservation**

The samples were preserved by the laboratory upon receipt and analyzed within the prescribed holding times.

**Calibration**

All initial and continuing calibration acceptance criteria were met. It should be noted that the results found on the Sulfide Benchsheet and the results found in the raw data differed slightly. The differences were not significant.

**Blanks**

The target analyte was not detected in the method blank.

**Laboratory Control Sample (LCS)**

The LCS analysis met laboratory acceptance criteria.

**Matrix Spike (MS)**

The MS analysis met all QC acceptance criteria with the following exception.

The MS recovery was < the lower acceptance limit but ≥30%. The associated sample results that were detects were **qualified J**, and the associated sample results that were non-detects were **qualified UJ**.

**Laboratory Duplicate**

The laboratory duplicate analysis met all QC acceptance criteria.

**Field Duplicate**

The field duplicate analysis met all QC acceptance criteria.

**Reporting Limits**

All reporting limits were properly reported. The samples were not diluted.

**Other QC**

No other specific issues that affect data quality were identified.

# Hahn Data Validation Summary Worksheet

| | | | |
|---|---|---|---|
| SDG#: AYO6_A6C1076 | Laboratory: ARI | Validator: Jeanne Peterson | Validation Date: 06/06/2016 |
| Site: Siltronic - Doane Creek | COC#: NA | | Validation Level: ☐ II  ☒ III |
| Matrix: Soil | # of Samples: 11 | Tracking docs present: See sample receipt and log-in documentation | |
| COCs present: Yes | COCs signed: Yes | COCs dated: Yes | Sample Container Integrity: OK |

Analyses:
☐ VOCs   ☐ SVOCs   ☐ PAHs   ☐ GRO   ☐ DRO   ☐ Pests   ☐ PCBs   ☐ Metals   ☒ Gen Chem   ☐ Cyanide
☐ Other:

| Requested Analyses Not Reported | | | |
|---|---|---|---|
| **Client Sample ID** | **Lab Sample ID** | **Analysis** | **Comments** |
| None | | | |
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| Hold Time/Preservation Outliers | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Client Sample ID** | **Lab Sample ID** | **Analysis** | **Pres.** | **Collection Date** | **Preparation Date** | **Analysis Date** | **Analysis <3X HT** | **Analysis ≥3X HT** |
| None | | | | | | | | |
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Comments:  Samples collected 3/28.

Cooler temps OK.  Samples preserved upon receipt.

# Hahn Level III General Chemistry Worksheet

| SDG: AYO6_A6C1076 | Matrix:  Soil | Lab Sample IDs: AYO6A thru AYO6K |
|---|---|---|
| Method/Batch #s: SM 4500-S2D (sulfide)/040416 #1 | | |

*(80-120%) (75-125%)  ≤20%*

| Analyte (outliers) | *(90-110%)* Calibration | | | | | | Method Blank | 5X MB | LCS %R | MS %R | Lab Dup RPD | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | r ≥0.995 | ICV | CCV | ICB | CCB | 5X CB | | | | | | | | | | | |
| Sulfide | ✓ | ✓ | ✓ | ✓ | ✓ | NA | ✓ | NA | ✓ | 31 | ✓ | | | | | | |

Comments:   HTs OK.  Distilled 4/4; analyzed 4/6.

MB, LCS, AYO6A MS, Dup ; AYO6G and AYO6H field dups
90-100%  = 0.45 to 0.55 for CCVs