**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 31-Oct-2017  Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 1202.6 | 1382.6 | 15.7 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU9  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1445 | 624 | 15 | 1057.0 | 16 | |
| 2 | 1445 | 625 | 15 | 1274.0 | 17 | |
| 3 | 1447 | 626 | 15 | 1016.0 | 16 | |
| 4 | 1448 | 627 | 15 | 1487.0 | 19 | |
| 5 (optional) | 1449 | 628 | 15 | 1179.0 | 17 | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 1202.6 | LOD = | 51.11 |
| | | | **SD** | 188.78 | **Ttl %RSD** | 15.70 |
| | | | n = | 5 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 968.2 | | |
| | 2-sided | Bag 95% t-UCL = | | 1437.0 | | |
| | 1-sided | Bag 95% t-LCL = | | 1022.6 | | |
| | 1-sided | Bag 95% t-UCL = | | 1382.6 | | |

9956453

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 834.6 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 1570.6 | | |
| subsampling error = | 15.63 | instrument error = | 1.42 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA DU9 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 215.8 | 226.8 | 6.2 | 93.5 | 100.0 | 8.4 |

**DU or Bag ID:** EBA PSA2 side (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1408 | 204 | 15 | 213.3 | 7.6 | |
| 2 | 1409 | 205 | 15 | 207.0 | 7.3 | |
| 3 | 1410 | 206 | 15 | 205.3 | 7.3 | |
| 4 | 1410 | 207 | 15 | 238.7 | 7.8 | |
| 5 (optional) | 1412 | 208 | 15 | 205.9 | 7.3 | |
| 6 (optional) | 1412 | 209 | 15 | 224.7 | 7.6 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 215.8 | LOD = | 22.46 |
| | | | **SD** | 13.38 | **Ttl %RSD** | 6.20 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | normal | | |

Operator: DMC

Clerical:

**Analysis Date:** 26-Oct-2017

Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-LCL = | 201.8 | | |
| | 2-sided | Bag 95% t-UCL = | 229.9 | | |
| | 1-sided | Bag 95% t-LCL = | 204.8 | | |
| | 1-sided | Bag 95% t-UCL = | 226.8 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 192.0 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 239.6 | | |
| subsampling error = | | 5.14 | instrument error = | 3.47 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | |
|---|---|
| | **particle size drop-down list** |
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA PSA2 side (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Operator: | DMC | | Clerical: | | | |
| **Analysis Date:** | 26-Oct-2017 | | Read Bag lot = | | PO 321861 | |
| **Particle Fraction Being Read:** | **<10-mesh** | **-mesh** | **(click in cell for drop-down)** | | | |
| Replicate reading 1 | 1630 | 266 | 15 | 99.7 | 5.3 | |
| 2 | 1631 | 267 | 15 | 85.6 | 5.00 | |
| 3 | 1632 | 268 | 15 | 91.0 | 5.20 | |
| 4 | 1633 | 269 | 15 | 105.0 | 5.40 | |
| 5 (optional) | 1634 | 270 | 15 | 85.1 | 5.00 | |
| 6 (optional) | 1636 | 271 | 15 | 94.7 | 5.30 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 93.5 | LOD = | 15.61 |
| | | | **SD** | 7.89 | **Ttl %RSD** | 8.44 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | normal | | |

**Original I**
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| | | | | | | |
|---|---|---|---|---|---|---|
| -2SD Lower bag limit | | Mean - 2 SD = | 77.7 | | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | 109.3 | | | |
| | 1-sided | Bag 95% t-LCL = | 87.0 | | | |
| | 1-sided | Bag 95% t-UCL = | 100.0 | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 79.5 | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 107.6 | | | |
| subsampling error = | | 6.34 | instrument error = | | 5.56 | as %RSD |

**Between-**
Pb
As

**Sample d**
Pb
As

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

| -1.5-g subsamples variability | | | Within-subsample bag variability | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

| luplicate mean variability | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 851.0 | 930.1 | 13.9 | 422.5 | 445.6 | 6.7 |

**DU or Bag ID:** EBA PSA1 (0-6) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 26-Oct-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1603 | 258 | 15 | 732.6 | 13 | |
| 2 | 1604 | 259 | 15 | 987.4 | 15 | |
| 3 | 1605 | 260 | 15 | 765.3 | 14 | |
| 4 | 1605 | 261 | 15 | 843.4 | 14 | |
| 5 (optional) | 1606 | 262 | 15 | 887.0 | 15 | |
| 6 (optional) | 1607 | 263 | 15 | 731.5 | 14 | |
| 7 (optional) | 1607 | 264 | 15 | 1052.0 | 16 | |
| 8 (optional) | 1608 | 265 | 15 | 808.4 | 14 | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 851.0 | LOD = | 43.20 |
| | | | **SD** | 118.21 | **Ttl %RSD** | 13.89 |
| | | | n = | 8 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 752.1 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 949.8 | | |
| | 1-sided | Bag 95% t-LCL = | 771.8 | | |
| | 1-sided | Bag 95% t-UCL = | 930.1 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 668.8 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 1033.1 | | |
| subsampling error = | | 13.79 | instrument error = | 1.69 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA PSA1 (6-24) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 26-Oct-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1657 | 273 | 15 | 411.9 | 10.1 | |
| 2 | 1658 | 274 | 15 | 470.8 | 11.0 | |
| 3 | 1700 | 275 | 15 | 419.0 | 10.5 | |
| 4 | 1703 | 276 | 15 | 387.7 | 9.9 | |
| 5 (optional) | 1705 | 277 | 15 | 411.0 | 10.2 | |
| 6 (optional) | 1705 | 278 | 15 | 434.8 | 10.4 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 422.5 | LOD = | 31.07 |
| | | | **SD** | 28.11 | **Ttl %RSD** | 6.65 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 366.3 | | |

**Original l**
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| | | | | | | |
|---|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 478.7 | | | Pb |
| | 1-sided | Bag 95% t-LCL = | 399.4 | | | As |
| | 1-sided | Bag 95% t-UCL = | 445.6 | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 372.5 | | | **Sample d** |
| | 1-sided Bag 95% Chebyshev UCL = | | 472.5 | | | Pb |
| subsampling error = | | 6.18 | instrument error = | 2.45 | as %RSD | As |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

| **-1.5-g subsamples variability** | **Within-subsample bag variability** |
|---|---|

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC Clerical:

**Analysis Date:** 28-Oct-2017 Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 378.3 | 404.4 | 12.6 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA North Transe (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1356 | 235 | | 416.4 | 10 | |
| 2 | 1357 | 236 | | 350.9 | 9 | |
| 3 | 1358 | 237 | | 370.0 | 9 | |
| 4 | 1359 | 238 | | 463.4 | 10 | |
| 5 (optional) | 1400 | 239 | | 379.2 | 10 | |
| 6 (optional) | 1407 | 240 | | 310.3 | 9 | |
| 7 (optional) | 1408 | 241 | | 295.1 | 8 | |
| 8 (optional) | 1409 | 242 | | 394.0 | 10 | |
| 9 (optional) | 1411 | 243 | | 407.1 | 9.5 | |
| 10 (optional) | 1412 | 244 | | 402.7 | 9.2 | |
| 11 (optional) | 1413 | 245 | | 372.6 | 9.2 | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 378.3 | LOD = | 27.70 |
| | | | **SD** | 47.71 | **Ttl %RSD** | 12.61 |
| | | | n = | 11 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 346.3 | | |
| | 2-sided | Bag 95% t-UCL = | | 410.4 | | |
| | 1-sided | Bag 95% t-LCL = | | 352.3 | | |
| | 1-sided | Bag 95% t-UCL = | | 404.4 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | | 315.6 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 441.0 | | |
| subsampling error = | 12.37 | instrument error = | | 2.44 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA North Transe (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
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**Between-**
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| | | | | | | |
|---|---|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | **Sample d** |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | Pb |
| subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD | As |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 28-Oct-2017  Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 299.4 | 308.9 | 3.8 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA South Transe (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1628 | 262 | | 306.0 | 8 | |
| 2 | 1629 | 263 | | 301.0 | 9 | |
| 3 | 2629 | 264 | | 315.3 | 8 | |
| 4 | 1630 | 265 | | 296.8 | 8 | |
| 5 (optional) | 1632 | 266 | | 296.8 | 8 | |
| 6 (optional) | 1633 | 267 | | 280.7 | 8 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 299.4 | LOD = | 24.71 |
| | | | **SD** | 11.51 | **Ttl %RSD** | 3.84 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 287.4 | | |
| | 2-sided | Bag 95% t-UCL = | | 311.5 | | |
| | 1-sided | Bag 95% t-LCL = | | 290.0 | | |
| | 1-sided | Bag 95% t-UCL = | | 308.9 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | | 279.0 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 319.9 | | |
| subsampling error = | 2.68 | instrument error = | | 2.75 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | |
|---|---|
| | **particle size drop-down list** |
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA South Transe (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original b**
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As

**Between-**
Pb
As

| | | | | | | |
|---|---|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | **Sample d** |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | Pb |
| subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD | As |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 397 | 431 | 10.6 | 18.3 | 22.0 | 24.5 |

**DU or Bag ID:** EBA SU 1 (0-6) **Element:** **Pb**

Operator: DMC Clerical: PJZ

**Analysis Date:** 28-Oct-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** **bulk** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 16:07 | 256 | 15 | 389.0 | 9.3 | |
| 2 | 16:07 | 257 | 15 | 451.5 | 9.7 | |
| 3 | 16:08 | 258 | 15 | 429.7 | 9.1 | |
| 4 | 16:08 | 259 | 15 | 329.5 | 8.4 | |
| 5 (optional) | 16:09 | 260 | 15 | 388.9 | 9.2 | |
| 6 (optional) | 16:19 | 261 | 15 | 391.1 | 9.4 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 396.6 | LOD = | 27.5 |
| | | | **SD** | 41.9 | **Ttl %RSD** | 10.6 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 352.7 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 440.5 | | |
| | 1-sided | Bag 95% t-LCL = | 362.2 | | |
| | 1-sided | Bag 95% t-UCL = | 431.0 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 322.1 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 471.1 | | |
| subsampling error = | | 10.30 | instrument error = | 2.31 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LC
nce limits. The spreadsheet partitions data error between analytical (XRF instru

**' comparability analysis.**

| | |
|---|---|
| | **particle size drop-down list** |
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA SU 1 (6-24) **Element:** **Pb**

Operator: SLM Clerical: PJZ

**Analysis Date:** 30-Oct-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? | |
|---|---|---|---|---|---|---|---|
| Replicate reading 1 | 952 | 283 | 15 | 15.3 | 2.9 | | |
| 2 | 953 | 284 | 15 | 12.4 | 2.70 | | |
| 3 | 954 | 285 | 15 | 25.8 | 3.20 | | |
| 4 | 955 | 286 | 15 | 18.8 | 3.00 | | |
| 5 (optional) | 956 | 287 | 15 | 18.5 | 3.10 | | |
| 6 (optional) | 959 | 288 | 15 | 19.1 | 3.00 | | |
| 7 (optional) | | | | | | | |
| 8 (optional) | | | | | | | |
| 9 (optional) | | | | | | | |
| 10 (optional) | | | | | | | |
| 11 (optional) | | | | | | | |
| 12 (optional) | | | | | | | |
| | | | **Mean** | 18.3 | LOD = | 8.96 | **Original l** |
| | | | **SD** | 4.49 | **Ttl %RSD** | 24.54 | Pb |
| | | | n = | 6 | | | As |
| | | ProUCL distribution = | | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 9.3 | | | **Between-** |

| | | | | | | |
|---|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 27.3 | | | Pb |
| | 1-sided | Bag 95% t-LCL = | 14.6 | | | As |
| | 1-sided | Bag 95% t-UCL = | 22.0 | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 10.3 | | | **Sample d** |
| | 1-sided Bag 95% Chebyshev UCL = | | 26.3 | | | Pb |
| subsampling error = | 18.33 | instrument error = | | 16.31 | as %RSD | As |

Ls and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCL
ument precision) and sampling error (data variability due to matrix heterogene

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

**-1.5-g subsamples variability** **Within-subsample bag variability**

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 454.7 | 610.1 | 41.5 | 72.4 | 80.1 | 14.5 |

**DU or Bag ID:** EBA SU2 (0-6) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 30-Oct-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1500 | 340 | 15 | 307.9 | 9 | |
| 2 | 1501 | 341 | 15 | 453.8 | 11 | |
| 3 | 1502 | 342 | 15 | 826.5 | 15 | |
| 4 | 1504 | 343 | 15 | 350.2 | 10 | |
| 5 (optional) | 1504 | 344 | 15 | 378.0 | 10 | |
| 6 (optional) | 1504 | 345 | 15 | 411.9 | 11 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 454.7 | LOD = | 33.51 |
| | | | **SD** | 188.90 | **Ttl %RSD** | 41.54 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 256.5 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 653.0 | | |
| | 1-sided | Bag 95% t-LCL = | 299.3 | | |
| | 1-sided | Bag 95% t-UCL = | 610.1 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 118.6 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 790.9 | | |
| subsampling error = | | 41.47 | instrument error = | 2.46 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LC
nce limits. The spreadsheet partitions data error between analytical (XRF instr

## comparability analysis.

| | |
|---|---|
| | **particle size drop-down list** |
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot =

**Particle Fraction Being Read:** **<10-mesh** **-mesh (cli**

**DU or Bag ID:** EBA SU **10/30/2017** (6-24)

Operator: SLM Clerical:

**Analysis Date:** 30-Oct-2017 Read Bag lot =

**Particle Fraction Being Read:** **<10-mesh** **-mesh (cli**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) |
|---|---|---|---|---|
| Replicate reading 1 | 1040 | 299 | 15 | 83.7 |
| 2 | 1041 | 300 | 15 | 58.8 |
| 3 | 1043 | 301 | 15 | 61.3 |
| 4 | 1044 | 302 | 15 | 72.3 |
| 5 (optional) | 1048 | 303 | 15 | 75.1 |
| 6 (optional) | 1049 | 304 | 15 | 68.7 |
| 7 (optional) | 1051 | 305 | 15 | 86.8 |
| 8 (optional) | | | | |
| 9 (optional) | | | | |
| 10 (optional) | | | | |
| 11 (optional) | | | | |
| 12 (optional) | | | | |
| | | | **Mean** | 72.4 |
| | | | **SD** | 10.52 |
| | | | n = | 7 |
| | | | ProUCL distribution = | normal |
| -2SD Lower bag limit | | | Mean - 2 SD = | 51.3 |

| | | | |
|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 93.4 |
| | 1-sided | Bag 95% t-LCL = | 64.6 |
| | 1-sided | Bag 95% t-UCL = | 80.1 |
| | | 1-sided Bag 95% Chebyshev LCL = | 55.0 |
| | | 1-sided Bag 95% Chebyshev UCL = | 89.7 |
| subsampling error = | | 12.97 | instrument error = |

CLs and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ument precision) and sampling error (data variability due to matrix heterogeneity

PO 321861

**ck in cell for drop-down)**

**Element: Pb**

WM A6070C5

**ck in cell for drop-down)**

| Instrument Error (as 1 Std Dev) | Note? |
|---|---|
| 5.0 | |
| 4.4 | |
| 4.4 | |
| 4.9 | |
| 4.8 | |
| 4.6 | |
| 5.13 | |
| | |
| | |
| | |
| | |
| | |
| LOD = | 14.28 |
| **Ttl %RSD** | 14.54 |
| | |
| | |
| | |

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

**Original bag: within-sample bag variability**

| | | | |
|---|---|---|---|
| Pb | move betw rdgs | #VALUE! | %RSD |
| As | ave of 2 dups | #VALUE! | %RSD |

**Replicate readings: analytical va**

| | | |
|---|---|---|
| no-move-betw rdgs | | #VALUE! |
| | triplicates | #VALUE! |

**Between-1.5-g subsamples variability**

**Within-subsample bag variabilit**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pb | var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! |
| | | As | sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! |
| | | | | | | | |
| | | **Sample duplicate mean variability** | | | | | |
| | | Pb | var betw means | #DIV/0! | %RSD | | |
| 6.58 | as %RSD | As | of 2 ind. analyses | #DIV/0! | %RSD | | |

and UCLs (for non-normal data).
within the sample/bag).

**ariability**
%RSD
%RSD

**y**

%RSD
%RSD

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**-mesh** (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 203.3 | 217.9 | 6.1 | 35.3 | 40.9 | 13.4 |

**DU or Bag ID:** EBA DU1A (0-6) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 30-Oct-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** <10-mesh

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1523 | 350 | 15 | 199.9 | 7 | |
| 2 | 1524 | 351 | 15 | 187.1 | 7 | |
| 3 | 1525 | 352 | 15 | 213.2 | 7 | |
| 4 | 1526 | 353 | 15 | 212.9 | 7 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 203.3 | LOD = | 20.79 |
| | | | **SD** | 12.44 | **Ttl %RSD** | 6.12 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 183.5 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 223.1 | | |
| | 1-sided | Bag 95% t-LCL = | 188.6 | | |
| | 1-sided | Bag 95% t-UCL = | 217.9 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 176.2 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 230.4 | | |
| subsampling error = | | 5.08 | instrument error = | 3.41 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA DU1A (6-24) **Element:** **Pb**

Operator: MSJ Clerical:

**Analysis Date:** 4-Nov-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** **<10-mesh**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1710 | 604 | 15 | 36.1 | 4.6 | |
| 2 | 1710 | 605 | 15 | 40.3 | 3.8 | |
| 3 | 1711 | 606 | 15 | 36.0 | 3.6 | |
| 4 | 1712 | 607 | 15 | 28.9 | 3.4 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 35.3 | LOD = | 11.64 |
| | | | **SD** | 4.73 | **Ttl %RSD** | 13.39 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 25.9 | | |

**Original l**
Pb
As

**Between-**

| | | | | | | |
|---|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 44.8 | | | Pb |
| | 1-sided | Bag 95% t-LCL = | 29.8 | | | As |
| | 1-sided | Bag 95% t-UCL = | 40.9 | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 25.0 | | | **Sample d** |
| | 1-sided Bag 95% Chebyshev UCL = | | 45.7 | | | Pb |
| subsampling error = | | 7.66 | instrument error = | 10.98 | as %RSD | As |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

| **-1.5-g subsamples variability** | **Within-subsample bag variability** |
|---|---|

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 30-Oct-2017  Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 161.2 | 172.7 | 10.6 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU1B  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1528 | 354 | 15 | 168.6 | 6 | |
| 2 | 1529 | 355 | 15 | 135.9 | 6 | |
| 3 | 1530 | 356 | 15 | 146.7 | 6 | |
| 4 | 1531 | 357 | 15 | 143.5 | 6 | |
| 5 (optional) | 1532 | 358 | 15 | 167.5 | 6 | |
| 6 (optional) | 1533 | 359 | 15 | 181.0 | 7 | |
| 7 (optional) | 1533 | 360 | 15 | 181.0 | 7 | |
| 8 (optional) | 1535 | 361 | 15 | 165.6 | 6 | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 161.2 | LOD = | 19.20 |
| | | | **SD** | 17.16 | **Ttl %RSD** | 10.64 |
| | | | n = | 8 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 146.9 | | |
| | 2-sided | Bag 95% t-UCL = | | 175.6 | | |
| | 1-sided | Bag 95% t-LCL = | | 149.7 | | |
| | 1-sided | Bag 95% t-UCL = | | 172.7 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 134.8 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 187.7 | | |
| subsampling error = | 9.88 | instrument error = | 3.97 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | |
|---|---|
| | **particle size drop-down list** |
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA DU1B (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC Clerical:

**Analysis Date:** 30-Oct-2017 Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 166.1 | 172.7 | 5.4 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU1C (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1540 | 362 | 15 | 153.98 | 6 | |
| 2 | 1541 | 363 | 15 | 164.01 | 6 | |
| 3 | 1542 | 364 | 15 | 180.93 | 7 | |
| 4 | 1543 | 365 | 15 | 173.95 | 7 | |
| 5 (optional) | 1545 | 366 | 15 | 167.22 | 7 | |
| 6 (optional) | 1546 | 367 | 15 | 160.92 | 6 | |
| 7 (optional) | 1547 | 368 | 15 | 162.03 | 6 | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 166.1 | LOD = | 19.33 |
| | | | **SD** | 8.92 | **Ttl %RSD** | 5.37 |
| | | | n = | 7 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 157.9 | | |
| | 2-sided | Bag 95% t-UCL = | | 174.4 | | |
| | 1-sided | Bag 95% t-LCL = | | 159.6 | | |
| | 1-sided | Bag 95% t-UCL = | | 172.7 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 151.5 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 180.8 | | |
| subsampling error = | 3.71 | instrument error = | 3.88 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA DU1C (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC Clerical:

**Analysis Date:** 30-Oct-2017 Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 90.5 | 94.8 | 4.0 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA SUS 101 (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1633 | 395 | 15 | 92.4 | 5 | |
| 2 | 1634 | 396 | 15 | 94.5 | 5 | |
| 3 | 1635 | 397 | 15 | 86.5 | 5 | |
| 4 | 1636 | 398 | 15 | 88.7 | 5 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 90.5 | LOD = | 14.76 |
| | | | **SD** | 3.59 | **Ttl %RSD** | 3.96 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 84.8 | | |
| | 2-sided | Bag 95% t-UCL = | | 96.2 | | |
| | 1-sided | Bag 95% t-LCL = | | 86.3 | | |
| | 1-sided | Bag 95% t-UCL = | | 94.8 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 82.7 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 98.4 | | |
| subsampling error = | <inst error | instrument error = | 5.44 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA SUS 101 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 30-Oct-2017  Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 80.9 | 90.9 | 15.0 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA SUS 101  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 152 | 369 | 15 | 75.3 | 4 | |
| 2 | 1553 | 370 | 15 | 65.8 | 4 | |
| 3 | 1554 | 371 | 15 | 72.8 | 4 | |
| 4 | 1555 | 372 | 15 | 99.9 | 5 | |
| 5 (optional) | 1557 | 373 | 15 | 85.9 | 5 | |
| 6 (optional) | 1558 | 374 | 15 | 86.0 | 5 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 80.9 | LOD = | 13.29 |
| | | | **SD** | 12.13 | **Ttl %RSD** | 14.99 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 68.2 | | |
| | 2-sided | Bag 95% t-UCL = | | 93.7 | | |
| | 1-sided | Bag 95% t-LCL = | | 71.0 | | |
| | 1-sided | Bag 95% t-UCL = | | 90.9 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 59.4 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 102.5 | | |
| subsampling error = | 13.95 | instrument error = | 5.47 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA SUS 101 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC Clerical:

**Analysis Date:** 30-Oct-2017 Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 87.4 | 96.4 | 10.8 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA SUS 101 (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1648 | 400 | 15 | 94.6 | 5 | |
| 2 | 1649 | 401 | 15 | 79.6 | 4 | |
| 3 | 1650 | 402 | 15 | 75.9 | 4 | |
| 4 | 1651 | 403 | 15 | 97.9 | 4 | |
| 5 (optional) | 1653 | 404 | 15 | 88.8 | 5 | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 87.4 | LOD = | 13.11 |
| | | | **SD** | 9.47 | **Ttl %RSD** | 10.84 |
| | | | n = | 5 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 75.6 | | |
| | 2-sided | Bag 95% t-UCL = | | 99.1 | | |
| | 1-sided | Bag 95% t-LCL = | | 78.3 | | |
| | 1-sided | Bag 95% t-UCL = | | 96.4 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 68.9 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 105.8 | | |
| subsampling error = | 9.61 | instrument error = | 5.00 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA SUS 101 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 368.7 | 388.1 | 4.5 | 123.6 | 138.0 | 18.8 |

**DU or Bag ID:** EBA SUT 1,1 (0-6) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 2-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1011 | 250 | 15 | 345.2 | 9.0 | |
| 2 | 1012 | 251 | 15 | 370.8 | 9.5 | |
| 3 | 1012 | 252 | 15 | 383.4 | 9.8 | |
| 4 | 1013 | 253 | 15 | 375.4 | 9.9 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 369 | LOD = | 28.7 |
| | | | **SD** | 16.5 | **Ttl %RSD** | 4.48 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 342 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 395 | | |
| | 1-sided | Bag 95% t-LCL = | 349 | | |
| | 1-sided | Bag 95% t-UCL = | 388 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 333 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 405 | | |
| subsampling error = | | 3.65 | instrument error = | 2.59 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA SUT 1,1 (6-24) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 7-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 0745 | 30 | 15 | 109.2 | 5.6 | |
| 2 | 0745 | 31 | 15 | 117.9 | 5.8 | |
| 3 | 0746 | 32 | 15 | 89.6 | 5.2 | |
| 4 | 0747 | 33 | 15 | 152.0 | 6.4 | |
| 5 (optional) | 0748 | 34 | 15 | 147.2 | 6.3 | |
| 6 (optional) | 0749 | 35 | 15 | 108.2 | 5.6 | |
| 7 (optional) | 0749 | 36 | 15 | 155.5 | 6.7 | |
| 8 (optional) | 0750 | 37 | 15 | 125.9 | 6.1 | |
| 9 (optional) | 0751 | 38 | 15 | 106.8 | 5.6 | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 123.6 | LOD = | 17.8 |
| | | | **SD** | 23.2 | **Ttl %RSD** | 18.8 |
| | | | n = | 9 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 77.2 | | |

**Original l**
Pb
As

**Between-**

| | | | | | | |
|---|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 170.0 | | | Pb |
| | 1-sided | Bag 95% t-LCL = | 109.2 | | | As |
| | 1-sided | Bag 95% t-UCL = | 138.0 | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 89.9 | | | **Sample d** |
| | 1-sided Bag 95% Chebyshev UCL = | | 157.3 | | | Pb |
| subsampling error = | | 18.14 | instrument error = | 4.81 | as %RSD | As |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

| **-1.5-g subsamples variability** | **Within-subsample bag variability** |
|---|---|

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC Clerical:

**Analysis Date:** 1-Nov-2017 Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 385.0 | 409.3 | 5.4 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA SUT1,2 (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1458 | 119 | 15 | 405.5 | 10 | |
| 2 | 1459 | 120 | 15 | 359.8 | 10 | |
| 3 | 1459 | 121 | 15 | 397.6 | 10 | |
| 4 | 1500 | 122 | 15 | 377.2 | 10 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 385.0 | LOD = | 29.64 |
| | | | **SD** | 20.61 | **Ttl %RSD** | 5.35 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 352.2 | | |
| | 2-sided | Bag 95% t-UCL = | | 417.8 | | |
| | 1-sided | Bag 95% t-LCL = | | 360.8 | | |
| | 1-sided | Bag 95% t-UCL = | | 409.3 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 340.1 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 430.0 | | |
| subsampling error = | 4.70 | instrument error = | 2.57 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA SUT1,2 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 399.8 | 421.1 | 4.5 | 162.8 | 204.3 | 43.9 |

**DU or Bag ID:** EBA SUT 1,3 (0-6) **Element:** **Pb**

Operator: MSJ Clerical:

**Analysis Date:** 3-Nov-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 0955 | 424 | 15 | 392.1 | 9.7 | |
| 2 | 0956 | 425 | 15 | 413.1 | 10.0 | |
| 3 | 0956 | 426 | 15 | 416.1 | 9.8 | |
| 4 | 0957 | 427 | 15 | 378.0 | 9.8 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 399.8 | LOD = | 29.5 |
| | | | **SD** | 18.0 | **Ttl %RSD** | 4.51 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 371.1 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 428.5 | | |
| | 1-sided | Bag 95% t-LCL = | 378.6 | | |
| | 1-sided | Bag 95% t-UCL = | 421.1 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 360.5 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 439.2 | | |
| subsampling error = | 3.79 | instrument error = | | 2.46 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |
| | | 2-sided | 95% t-UCL = | #VALUE! | | |
| | | 1-sided | 95% t-LCL = | #VALUE! | | |
| | | 1-sided | 95% t-UCL = | #VALUE! | | |
| | | 1-sided 95% Chebyshev LCL = | | #VALUE! | | |
| | | 1-sided 95% Chebyshev UCL = | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | |
| | | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |

4
5 (optional)
6 (optional)
7 (optional)
8 (optional)
9 (optional)
10 (optional)

| | | | |
|---|---|---|---|
| **Mean** | NA | | |
| **SD** | NA | **Ttl %RSD** | #VALUE! |
| n = | 0 | | |

ProUCL distribution =

| | | |
|---|---|---|
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |

| | | | |
|---|---|---|---|
| **Mean** | NA | | |
| **SD** | NA | **Ttl %RSD** | #VALUE! |
| n = | 0 | | |

ProUCL distribution =

| | | |
|---|---|---|
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA SUT 1,3 (6-24) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 2-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1635 | 337 | 15 | 148.7 | 6.3 | |
| 2 | 1637 | 338 | 15 | 138.3 | 6.16 | |
| 3 | 1638 | 339 | 15 | 110.5 | 5.56 | |
| 4 | 1639 | 340 | 15 | 114.6 | 5.55 | |
| 5 (optional) | 1640 | 341 | 15 | 158.6 | 6.42 | |
| 6 (optional) | 1640 | 342 | 15 | 155.7 | 6.45 | |
| 7 (optional) | 1641 | 343 | 15 | 360.4 | 9.51 | |
| 8 (optional) | 1642 | 344 | 15 | 142.7 | 6.21 | |
| 9 (optional) | 1642 | 345 | 15 | 162.8 | 6.48 | |
| 10 (optional) | 1643 | 346 | 15 | 135.9 | 6.03 | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 162.8 | LOD = | 19.66 |
| | | | **SD** | 71.56 | **Ttl %RSD** | 43.95 |
| | | | n = | 10 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 19.7 | | |

**Original l**
Pb
As

**Between-**

| | | | | | |
|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 306.0 | | |
| | 1-sided | Bag 95% t-LCL = | 121.3 | | |
| | 1-sided | Bag 95% t-UCL = | 204.3 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 64.2 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 261.5 | | |
| subsampling error = | 43.76 | instrument error = | | 4.02 | as %RSD |

Pb
As

**Sample d**
Pb
As

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |

n = 0

ProUCL distribution =

2-sided 95% t-LCL = #VALUE!

2-sided 95% t-UCL = #VALUE!

1-sided 95% t-LCL = #VALUE!

1-sided 95% t-UCL = #VALUE!

1-sided 95% Chebyshev LCL = #VALUE!

1-sided 95% Chebyshev UCL = #VALUE!

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |

n = 0

ProUCL distribution =

2-sided Bag 95% t-LCL = #VALUE!

2-sided Bag 95% t-UCL = #VALUE!

1-sided Bag 95% t-LCL = #VALUE!

1-sided Bag 95% t-UCL = #VALUE!

1-sided Bag 95% Chebyshev LCL = #VALUE!

1-sided Bag 95% Chebyshev UCL = #VALUE!

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

| **-1.5-g subsamples variability** | **Within-subsample bag variability** |
|---|---|

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 2-Nov-2017  Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 362.6 | 386.8 | 5.7 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA SUT 1,4  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1020 | 258 | 15 | 358.8 | 9.6 | |
| 2 | 1020 | 259 | 15 | 373.3 | 9.6 | |
| 3 | 1021 | 260 | 15 | 382.7 | 9.7 | |
| 4 | 1021 | 261 | 15 | 335.4 | 9.1 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 362.6 | LOD = | 28.5 |
| | | | **SD** | 20.6 | **Ttl %RSD** | 5.68 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 329.8 | | |
| | 2-sided | Bag 95% t-UCL = | | 395.3 | | |
| | 1-sided | Bag 95% t-LCL = | | 338.3 | | |
| | 1-sided | Bag 95% t-UCL = | | 386.8 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 317.7 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 407.4 | | |
| subsampling error = | 5.04 | instrument error = | 2.62 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

## comparability analysis.

| | |
|---|---|
| | **particle size drop-down list** |
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA SUT 1,4 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 2-Nov-2017  Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 462.3 | 555.6 | 17.1 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA SUT 1,5  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1023 | 262 | 15 | 562.4 | 11.9 | |
| 2 | 1024 | 263 | 15 | 487.1 | 11.0 | |
| 3 | 1025 | 264 | 15 | 385.0 | 9.9 | |
| 4 | 1025 | 265 | 15 | 414.9 | 10.5 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 462.3 | LOD = | 32.5 |
| | | | **SD** | 79.3 | **Ttl %RSD** | 17.15 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 336.2 | | |
| | 2-sided | Bag 95% t-UCL = | | 588.5 | | |
| | 1-sided | Bag 95% t-LCL = | | 369.1 | | |
| | 1-sided | Bag 95% t-UCL = | | 555.6 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 289.6 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 635.1 | | |
| subsampling error = | 16.99 | instrument error = | 2.34 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA SUT 1,5 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original b**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 151.3 | 154.2 | 2.3 | 46.5 | 50.3 | 6.9 |

**DU or Bag ID:** EBA DU 2A (0-6) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 30-Oct-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1717 | 414 | 15 | 152.5 | 6 | |
| 2 | 1718 | 415 | 15 | 153.4 | 6 | |
| 3 | 1719 | 416 | 15 | 153.7 | 6 | |
| 4 | 1719 | 417 | 15 | 153.3 | 6 | |
| 5 (optional) | 1721 | 418 | 15 | 144.5 | 6 | |
| 6 (optional) | 1722 | 419 | 15 | 150.3 | 6 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 151.3 | LOD = | 18.85 |
| | | | **SD** | 3.55 | **Ttl %RSD** | 2.34 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 147.6 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 155.0 | | |
| | 1-sided | Bag 95% t-LCL = | 148.4 | | |
| | 1-sided | Bag 95% t-UCL = | 154.2 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 145.0 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 157.6 | | |
| subsampling error = | <inst error | instrument error = | | 4.15 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA DU 2A (6-24) **Element:** **Pb**

Operator: MSJ Clerical:

**Analysis Date:** 4-Nov-2017 Read Bag lot = PO312861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1718 | 608 | | 47.2 | 4.1 | |
| 2 | 1719 | 609 | | 41.9 | 4.0 | |
| 3 | 1721 | 610 | | 49.3 | 4.1 | |
| 4 | 1722 | 611 | | 47.7 | 4.1 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 46.5 | LOD = | 12.15 |
| | | | **SD** | 3.21 | **Ttl %RSD** | 6.89 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 40.1 | | |

**Original l**
Pb
As

**Between-**

| | | | | | | |
|---|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 52.9 | | | Pb |
| | 1-sided | Bag 95% t-LCL = | 42.7 | | | As |
| | 1-sided | Bag 95% t-UCL = | 50.3 | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 39.5 | | | **Sample d** |
| | 1-sided Bag 95% Chebyshev UCL = | | 53.5 | | | Pb |
| subsampling error = | <inst error | instrument error = | | 8.71 | as %RSD | As |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

| **-1.5-g subsamples variability** | **Within-subsample bag variability** |
|---|---|

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 30-Oct-2017  Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 152.1 | 167.3 | 13.6 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU 2B  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1600 | 375 | 15 | 139.5 | 6 | |
| 2 | 1602 | 376 | 15 | 166.2 | 7 | |
| 3 | 1603 | 377 | 15 | 152.3 | 6 | |
| 4 | 1604 | 378 | 15 | 124.3 | 6 | |
| 5 (optional) | 1605 | 379 | 15 | 143.3 | 6 | |
| 6 (optional) | 1606 | 380 | 15 | 189.1 | 7 | |
| 7 (optional) | 1608 | 381 | 15 | 150.0 | 6 | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 152.1 | LOD = | 18.75 |
| | | | **SD** | 20.74 | **Ttl %RSD** | 13.64 |
| | | | n = | 7 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 132.9 | | |
| | 2-sided | Bag 95% t-UCL = | | 171.3 | | |
| | 1-sided | Bag 95% t-LCL = | | 136.9 | | |
| | 1-sided | Bag 95% t-UCL = | | 167.3 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 117.9 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 186.3 | | |
| subsampling error = | 13.00 | instrument error = | 4.11 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA DU 2B (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC Clerical:

**Analysis Date:** 30-Oct-2017 Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 155.4 | 172.6 | 9.4 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DUC 2C (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1626 | 391 | 15 | 169.1 | 7 | |
| 2 | 1627 | 392 | 15 | 166.7 | 7 | |
| 3 | 1628 | 393 | 15 | 145.3 | 6 | |
| 4 | 1629 | 394 | 15 | 140.5 | 6 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 155.4 | LOD = | 18.84 |
| | | | **SD** | 14.60 | **Ttl %RSD** | 9.39 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 132.2 | | |
| | 2-sided | Bag 95% t-UCL = | | 178.6 | | |
| | 1-sided | Bag 95% t-LCL = | | 138.2 | | |
| | 1-sided | Bag 95% t-UCL = | | 172.6 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 123.6 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 187.2 | | |
| subsampling error = | 8.48 | instrument error = | 4.04 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA DUC 2C (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC Clerical:

**Analysis Date:** 31-Oct-2017 Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 325.5 | 353.1 | 8.9 | 206.8 | 228.9 | 18.4 |

**DU or Bag ID:** EBA DU3 (0-6) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 31-Oct-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1553 | 674 | 15 | 367.5 | 9 | |
| 2 | 1554 | 675 | 15 | 336.2 | 9 | |
| 3 | 1557 | 676 | 15 | 289.3 | 8 | |
| 4 | 1557 | 677 | 15 | 314.5 | 9 | |
| 5 (optional) | 1559 | 678 | 15 | 320.1 | 9 | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 325.5 | LOD = | 26.36 |
| | | | **SD** | 28.89 | **Ttl %RSD** | 8.88 |
| | | | n = | 5 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 289.6 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 361.4 | | |
| | 1-sided | Bag 95% t-LCL = | 298.0 | | |
| | 1-sided | Bag 95% t-UCL = | 353.1 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 269.2 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 381.8 | | |
| subsampling error = | | 8.46 | instrument error = | 2.70 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | |
|---|---|
| | **particle size drop-down list** |
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**DU or Bag ID:** EBA DU3 (6-24) 2-Nov **Element:** **Pb**

Operator: MSJ Clerical:

**Analysis Date:** 2-Nov-2017 Read Bag lot = PO312861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? | |
|---|---|---|---|---|---|---|---|
| Replicate reading 1 | 1730 | 365 | 15 | 162.1 | 6.2 | | |
| 2 | 1731 | 366 | 15 | 171.8 | 6.6 | | |
| 3 | 1732 | 367 | 15 | 220.4 | 7.2 | | |
| 4 | 1733 | 368 | 15 | 245.4 | 7.5 | | |
| 5 (optional) | 1735 | 369 | 15 | 235.7 | 6.9 | | |
| 6 (optional) | 1736 | 370 | 15 | 188.5 | 6.5 | | |
| 7 (optional) | 1737 | 371 | 15 | 175.1 | 7.20 | | |
| 8 (optional) | 1738 | 372 | 15 | 202.9 | 8.10 | | |
| 9 (optional) | 1740 | 373 | 15 | 281.0 | 6.70 | | |
| 10 (optional) | 1742 | 374 | 15 | 185.4 | 6.70 | | |
| 11 (optional) | | | | | | | |
| 12 (optional) | | | | | | | |
| | | | **Mean** | 206.8 | LOD = | 20.94 | **Original I** |
| | | | **SD** | 38.08 | **Ttl %RSD** | 18.41 | Pb |
| | | | n = | 10 | | | As |
| | | ProUCL distribution = | | normal | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 130.7 | | | **Between-** |

| | | | | | | |
|---|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 283.0 | | | Pb |
| | 1-sided | Bag 95% t-LCL = | 184.8 | | | As |
| | 1-sided | Bag 95% t-UCL = | 228.9 | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 154.3 | | | **Sample d** |
| | 1-sided Bag 95% Chebyshev UCL = | | 259.3 | | | Pb |
| subsampling error = | | 18.10 | instrument error = | 3.37 | as %RSD | As |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
nent precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

**-1.5-g subsamples variability** **Within-subsample bag variability**

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 187 | 204 | 8.1 | 67.6 | 71.3 | 4.7 |

**DU or Bag ID:** EBA DU 4 (0-6) **Element:** **Pb**

Operator: DMC Clerical: PJZ

**Analysis Date:** 3-Nov-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1034 | 450 | 15 | 170.5 | 6.6 | |
| 2 | 1035 | 451 | 15 | 176.6 | 6.8 | |
| 3 | 1036 | 452 | 15 | 199.8 | 7.2 | |
| 4 | 1037 | 453 | 15 | 199.2 | 7.1 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 186.5 | LOD = | 20.8 |
| | | | **SD** | 15.2 | **Ttl %RSD** | 8.1 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 162.4 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 210.7 | | |
| | 1-sided | Bag 95% t-LCL = | 168.7 | | |
| | 1-sided | Bag 95% t-UCL = | 204.4 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 153.4 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 219.6 | | |
| subsampling error = | 7.25 | instrument error = | | 3.71 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |
| | | 2-sided | 95% t-UCL = | #VALUE! | | |
| | | 1-sided | 95% t-LCL = | #VALUE! | | |
| | | 1-sided | 95% t-UCL = | #VALUE! | | |
| | | 1-sided 95% Chebyshev LCL = | | #VALUE! | | |
| | | 1-sided 95% Chebyshev UCL = | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | |
| | | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |

4
5 (optional)
6 (optional)
7 (optional)
8 (optional)
9 (optional)
10 (optional)

| | | | |
|---|---|---|---|
| **Mean** | NA | | |
| **SD** | NA | **Ttl %RSD** | #VALUE! |
| n = | 0 | | |

ProUCL distribution =

| | | |
|---|---|---|
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |

| | | | |
|---|---|---|---|
| **Mean** | NA | | |
| **SD** | NA | **Ttl %RSD** | #VALUE! |
| n = | 0 | | |

ProUCL distribution =

| | | |
|---|---|---|
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA DU 4 (6-24) **Element:** **Pb**

Operator: DMC Clerical: PJZ

**Analysis Date:** 6-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 0854 | 634 | 15 | 70.8 | 4.7 | |
| 2 | 0855 | 635 | 15 | 63.3 | 4.6 | |
| 3 | 0856 | 636 | 15 | 67.9 | 4.8 | |
| 4 | 0856 | 637 | 15 | 68.6 | 4.8 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 67.6 | LOD = | 14.12 |
| | | | **SD** | 3.15 | **Ttl %RSD** | 4.66 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 61.3 | | |

**Original I**
Pb
As

**Between-**

| | | | | | |
|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 73.9 | | |
| | 1-sided | Bag 95% t-LCL = | 63.9 | | |
| | 1-sided | Bag 95% t-UCL = | 71.3 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 60.7 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 74.5 | | |
| subsampling error = | <inst error | instrument error = | | 6.96 | as %RSD |

Pb
As

**Sample d**
Pb
As

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |

n = 0

ProUCL distribution =

2-sided 95% t-LCL = #VALUE!

2-sided 95% t-UCL = #VALUE!

1-sided 95% t-LCL = #VALUE!

1-sided 95% t-UCL = #VALUE!

1-sided 95% Chebyshev LCL = #VALUE!

1-sided 95% Chebyshev UCL = #VALUE!

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |

n = 0

ProUCL distribution =

2-sided Bag 95% t-LCL = #VALUE!

2-sided Bag 95% t-UCL = #VALUE!

1-sided Bag 95% t-LCL = #VALUE!

1-sided Bag 95% t-UCL = #VALUE!

1-sided Bag 95% Chebyshev LCL = #VALUE!

1-sided Bag 95% Chebyshev UCL = #VALUE!

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
nent precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

**-1.5-g subsamples variability** **Within-subsample bag variability**

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: Sarick Matzen  Clerical: DMC

**Analysis Date:** 30-Oct-2017  Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | mean | UCL | %RSD |
|---|---|---|---|---|---|
| 782.3 | 1212.7 | 66.9 | | | |

**DU or Bag ID:** EBA DU-5  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1733 | 428 | 15 | 557.0 | 12.6 | |
| 2 | 1734 | 429 | 15 | 569.0 | 12.3 | |
| 3 | 1735 | 430 | 15 | 1850.0 | 23.0 | |
| 4 | 1736 | 431 | 15 | 590.8 | 12.7 | |
| 5 (optional) | 1740 | 432 | 15 | 558.1 | 12.0 | |
| 6 (optional) | 1741 | 433 | 15 | 568.9 | 12.1 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 782.3 | LOD = | 44.00 |
| | | | **SD** | 523.2 | **Ttl %RSD** | 66.9 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 233.2 | | |
| | 2-sided | Bag 95% t-UCL = | | 1331.4 | | |
| | 1-sided | Bag 95% t-LCL = | | 351.9 | | |
| | 1-sided | Bag 95% t-UCL = | | 1212.7 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | -148.8 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 1713.4 | | |
| subsampling error = | 66.85 | instrument error = | 1.87 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided 95% t-LCL = | #VALUE! | |
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided Bag 95% t-LCL = | #VALUE! | |
| 2-sided Bag 95% t-UCL = | #VALUE! | |
| 1-sided Bag 95% t-LCL = | #VALUE! | |
| 1-sided Bag 95% t-UCL = | #VALUE! | |
| 1-sided Bag 95% Chebyshev LCL = | #VALUE! | |
| 1-sided Bag 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | 2-sided | | Bag 95% t-LCL = | #VALUE! | | |
| | 2-sided | | Bag 95% t-UCL = | #VALUE! | | |
| | 1-sided | | Bag 95% t-LCL = | #VALUE! | | |
| | 1-sided | | Bag 95% t-UCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | 2-sided | | Bag 95% t-LCL = | #VALUE! | | |
| | 2-sided | | Bag 95% t-UCL = | #VALUE! | | |
| | 1-sided | | Bag 95% t-LCL = | #VALUE! | | |
| | 1-sided | | Bag 95% t-UCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

## comparability analysis.

| | particle size drop-down list |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <80-mesh |
| PO 321861 | <120-mesh |

**NOTE ADD'L PARTICLE FRACTIONS ANALYZED BELOW!!**

**DU or Bag ID:** EBA DU-5 (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? | |
|---|---|---|---|---|---|---|---|
| **Analyst:** | DMC | **Date:** | 11/6/2017 | **Fraction:** | <80-mesh | | |
| Replicate reading 1 | 1353 | 738 | 15 | 701.2 | 13.4 | | |
| 2 | 1354 | 739 | 15 | 674.4 | 13.3 | | |
| 3 | 1354 | 740 | 15 | 719.4 | 13.8 | | |
| 4 | 1355 | 741 | 15 | 722.1 | 14.4 | | |
| 5 (optional) | 1356 | 742 | 15 | 738.8 | 14.4 | | |
| 6 (optional) | 1356 | 743 | 15 | 692.3 | 14.1 | | |
| 7 (optional) | | | | | | | |
| 8 (optional) | | | | | | | |
| 9 (optional) | | | | | | | |
| 10 (optional) | | | | | | | |
| 11 (optional) | | | | | | | |
| 12 (optional) | | | | | | | |
| | | | **Mean** | 708.0 | LOD = | 41.7 | **Original I** |
| Hypothesis Test for | | | **SD** | 23.2 | **Ttl %RSD** | 3.3 | Pb |
| Fraction Agreement | | | n = | 6 | | | As |
| T-test p-value = | | ProUCL distribution = | | | | | |
| 0.7424 | ver bag limit | Mean - 2 SD = | | 661.6 | | | **Between-** |
| Fractions same | per bag limit | Mean + 2 SD = | | 754.5 | | | Pb |
| | 2-sided | Bag 95% t-LCL = | | 683.7 | | | As |
| | 2-sided | Bag 95% t-UCL = | | 732.4 | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | | 666.7 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 749.4 | | |
| subsampling error = | 2.63 | instrument error = | | 1.96 | as %RSD |

**Sample d**
Pb
As

**DU or Bag ID:** EBA DU-5 (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **Analyst:** | DMC | **Date:** | 11/6/2017 | **Fraction:** | <120-mesh | |
| Replicate reading 1 | 1346 | 732 | 15 | 884.9 | 15.5 | |
| 2 | 1347 | 733 | 15 | 903.6 | 15.9 | |
| 3 | 1348 | 734 | 15 | 832.1 | 15.0 | |
| 4 | 1350 | 735 | 15 | 901.4 | 15.6 | |
| 5 (optional) | 1351 | 736 | 15 | 912.3 | 15.7 | |
| 6 (optional) | 1351 | 737 | 15 | 810.9 | 15.0 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | 874.2 | LOD = | 46.4 |
| Hypothesis Test for | | | **SD** | 42.31 | **Ttl %RSD** | 4.8 |
| Fraction Agreement | | | n = | 6 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| 0.0000 | ver bag limit | Mean - 2 SD = | | 789.6 | | |
| Fractions different | er bag limit | Mean + 2 SD = | | 958.8 | | |
| | 2-sided | Bag 95% t-LCL = | | 829.8 | | |
| | 2-sided | Bag 95% t-UCL = | | 918.6 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | 798.9 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | 949.5 | | |
| subsampling error = | | 4.51 | instrument error = | | 1.77 | as %RSD |

**DU or Bag ID:** **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **Analyst:** | | **Date:** | | **Fraction:** | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | | 2-sided | 95% t-LCL = | #VALUE! | | |
| #DIV/0! | | 2-sided | 95% t-UCL = | #VALUE! | | |
| | | 1-sided | 95% t-LCL = | #VALUE! | | |
| | | 1-sided | 95% t-UCL = | #VALUE! | | |
| | | 1-sided 95% Chebyshev LCL = | | #VALUE! | | |
| | | 1-sided 95% Chebyshev UCL = | | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | 4.1 | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | 14.9 | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 258 | 270 | 4.0 | 56.1 | 83.6 | 73.1 |

**DU or Bag ID:** EBA DU 6 (0-6) **Element:** **Pb**

Operator: DMC Clerical: PJZ

**Analysis Date:** 2-Nov-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1653 | 357 | 15 | 252.8 | 8.1 | |
| 2 | 1654 | 358 | 15 | 251.5 | 7.9 | |
| 3 | 1655 | 359 | 15 | 273.3 | 8.4 | |
| 4 | 1655 | 360 | 15 | 253.2 | 8 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 257.7 | LOD = | 24.3 |
| | | | **SD** | 10.4 | **Ttl %RSD** | 4.0 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 241.1 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 274.3 | | |
| | 1-sided | Bag 95% t-LCL = | 245.4 | | |
| | 1-sided | Bag 95% t-UCL = | 270.0 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 235.0 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 280.4 | | |
| subsampling error = | 2.55 | instrument error = | | 3.14 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |
| | | 2-sided | 95% t-UCL = | #VALUE! | | |
| | | 1-sided | 95% t-LCL = | #VALUE! | | |
| | | 1-sided | 95% t-UCL = | #VALUE! | | |
| | | 1-sided 95% Chebyshev LCL = | | #VALUE! | | |
| | | 1-sided 95% Chebyshev UCL = | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | |
| | | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |

4
5 (optional)
6 (optional)
7 (optional)
8 (optional)
9 (optional)
10 (optional)

| | | | |
|---|---|---|---|
| **Mean** | NA | | |
| **SD** | NA | **Ttl %RSD** | #VALUE! |
| n = | 0 | | |

ProUCL distribution =

| | | |
|---|---|---|
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |

| | | | |
|---|---|---|---|
| **Mean** | NA | | |
| **SD** | NA | **Ttl %RSD** | #VALUE! |
| n = | 0 | | |

ProUCL distribution =

| | | |
|---|---|---|
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA DU 6 (6-24) **Element:** **Pb**

Operator: DMC Clerical: PJZ

**Analysis Date:** 6-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 8:28 | 626 | 15 | 34.1 | 3.5 | |
| 2 | 8:29 | 627 | 15 | 153.5 | 6.3 | |
| 3 | 8:29 | 628 | 15 | 42.2 | 3.8 | |
| 4 | 8:31 | 629 | 15 | 69.1 | 4.5 | |
| 5 (optional) | 8:32 | 630 | 15 | 41.6 | 3.79 | |
| 6 (optional) | 8:37 | 631 | 15 | 28.9 | 3.39 | |
| 7 (optional) | 8:38 | 632 | 15 | 39.7 | 3.80 | |
| 8 (optional) | 8:38 | 633 | 15 | 40.1 | 3.76 | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 56.1 | LOD = | 12.61 |
| | | | **SD** | 41.06 | **Ttl %RSD** | 73.12 |
| | | | n = | 8 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | -26.0 | | |

**Original I**
Pb
As

**Between-**

| | | | | | |
|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 138.3 | | |
| | 1-sided | Bag 95% t-LCL = | 28.6 | | |
| | 1-sided | Bag 95% t-UCL = | 83.6 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | -7.1 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 119.4 | | |
| subsampling error = | 72.74 | instrument error = | | 7.49 | as %RSD |

Pb
As

**Sample d**
Pb
As

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |

n = 0

ProUCL distribution =

2-sided 95% t-LCL = #VALUE!

2-sided 95% t-UCL = #VALUE!

1-sided 95% t-LCL = #VALUE!

1-sided 95% t-UCL = #VALUE!

1-sided 95% Chebyshev LCL = #VALUE!

1-sided 95% Chebyshev UCL = #VALUE!

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |

n = 0

ProUCL distribution =

2-sided Bag 95% t-LCL = #VALUE!

2-sided Bag 95% t-UCL = #VALUE!

1-sided Bag 95% t-LCL = #VALUE!

1-sided Bag 95% t-UCL = #VALUE!

1-sided Bag 95% Chebyshev LCL = #VALUE!

1-sided Bag 95% Chebyshev UCL = #VALUE!

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
nent precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

**-1.5-g subsamples variability** **Within-subsample bag variability**

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 1-Nov-2017  Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 180.7 | 188.9 | 7.7 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU 7  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1520 | 142 | 15 | 196.9 | 7 | |
| 2 | 1521 | 143 | 15 | 203.7 | 7 | |
| 3 | 1521 | 144 | 15 | 160.6 | 6 | |
| 4 | 1523 | 145 | 15 | 163.7 | 6 | |
| 5 (optional) | 1524 | 146 | 15 | 174.0 | 6 | |
| 6 (optional) | 1527 | 147 | 15 | 178.5 | 7 | |
| 7 (optional) | 1528 | 148 | 15 | 193.5 | 6 | |
| 8 (optional) | 1529 | 149 | 15 | 173.5 | 6 | |
| 9 (optional) | 1530 | 150 | 15 | 179.2 | 6.2 | |
| 10 (optional) | 1530 | 151 | 15 | 183.8 | 6.4 | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 180.7 | LOD = | 19.18 |
| | | | **SD** | 13.99 | **Ttl %RSD** | 7.74 |
| | | | n = | 10 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 170.7 | | |
| | 2-sided | Bag 95% t-UCL = | | 190.7 | | |
| | 1-sided | Bag 95% t-LCL = | | 172.6 | | |
| | 1-sided | Bag 95% t-UCL = | | 188.9 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 161.5 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 200.0 | | |
| subsampling error = | 6.89 | instrument error = | 3.54 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA DU 7 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 3-Nov-2017  Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 319.5 | 364.9 | 17.3 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU 8  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 0919 | 402 | 15 | 325.7 | 9 | |
| 2 | 0919 | 403 | 15 | 290.9 | 9 | |
| 3 | 0920 | 404 | 15 | 322.3 | 9 | |
| 4 | 0921 | 405 | 15 | 422.9 | 10 | |
| 5 (optional) | 922 | 406 | 15 | 269.1 | 8 | |
| 6 (optional) | 0923 | 407 | 15 | 286.1 | 8 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 319.5 | LOD = | 26.62 |
| | | | **SD** | 55.16 | **Ttl %RSD** | 17.26 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 261.6 | | |
| | 2-sided | Bag 95% t-UCL = | | 377.4 | | |
| | 1-sided | Bag 95% t-LCL = | | 274.1 | | |
| | 1-sided | Bag 95% t-UCL = | | 364.9 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 221.3 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 417.7 | | |
| subsampling error = | 17.04 | instrument error = | 2.78 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA DU 8 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 328.0 | 335.4 | 2.7 | 129.3 | 134.3 | 3.3 |

**DU or Bag ID:** EBA DU-10A (0-6) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 2-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 0954 | 231 | 15 | 321.0 | 9.1 | |
| 2 | 0955 | 232 | 15 | 323.5 | 9.1 | |
| 3 | 0956 | 233 | 15 | 320.9 | 9.0 | |
| 4 | 0956 | 234 | 15 | 343.0 | 8.9 | |
| 5 (optional) | 0958 | 235 | 15 | 334.8 | 8.8 | |
| 6 (optional) | 0958 | 236 | 15 | 324.7 | 8.6 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 328.0 | LOD = | 26.76 |
| | | | **SD** | 8.96 | **Ttl %RSD** | 2.73 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 318.6 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 337.4 | | |
| | 1-sided | Bag 95% t-LCL = | 320.6 | | |
| | 1-sided | Bag 95% t-UCL = | 335.4 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 312.0 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 343.9 | | |
| subsampling error = | | 0.28 | instrument error = | 2.72 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA DU-10A (6-24) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 2-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1624 | 325 | 15 | 123.6 | 5.8 | |
| 2 | 1625 | 326 | 15 | 131.3 | 6.0 | |
| 3 | 1625 | 327 | 15 | 128.5 | 6.1 | |
| 4 | 1626 | 328 | 15 | 133.6 | 6.0 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 129.3 | LOD = | 17.93 |
| | | | **SD** | 4.31 | **Ttl %RSD** | 3.33 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 120.6 | | |

**Original l**
Pb
As

**Between-**

| | | | | | | |
|---|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 137.9 | | | Pb |
| | 1-sided | Bag 95% t-LCL = | 124.2 | | | As |
| | 1-sided | Bag 95% t-UCL = | 134.3 | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 119.9 | | | **Sample d** |
| | 1-sided Bag 95% Chebyshev UCL = | | 138.6 | | | Pb |
| subsampling error = | <inst error | instrument error = | | 4.62 | as %RSD | As |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

| **-1.5-g subsamples variability** | **Within-subsample bag variability** |
|---|---|

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 355.5 | 367.7 | 5.1 | 121.6 | 149.8 | 28.1 |

**DU or Bag ID:** EBA DU-10B (0-6) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 3-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 0959 | 237 | 15 | 326.3 | 9.0 | |
| 2 | 1000 | 238 | 15 | 348.3 | 9.1 | |
| 3 | 1001 | 239 | 15 | 340.0 | 9.0 | |
| 4 | 1001 | 240 | 15 | 349.2 | 9.1 | |
| 5 (optional) | 1002 | 241 | 15 | 374.4 | 9.3 | |
| 6 (optional) | 1003 | 242 | 15 | 380.2 | 9.4 | |
| 7 (optional) | 1004 | 243 | 15 | 356.5 | 9.2 | |
| 8 (optional) | 1004 | 244 | 15 | 369.1 | 9.5 | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 355.5 | LOD = | 27.60 |
| | | | **SD** | 18.27 | **Ttl %RSD** | 5.14 |
| | | | n = | 8 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 340.2 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 370.8 | | |
| | 1-sided | Bag 95% t-LCL = | 343.3 | | |
| | 1-sided | Bag 95% t-UCL = | 367.7 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 327.3 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 383.7 | | |
| subsampling error = | 4.44 | instrument error = | | 2.59 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

Operator: Clerical:

**Analysis Date:** Read Bag lot =

**Particle Fraction Being Read:** **bulk** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

Replicate reading 1
2
3
4
5 (optional)
6 (optional)
7 (optional)
8 (optional)
9 (optional)
10 (optional)

| | | | | | |
|---|---|---|---|---|---|
| | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

Operator: Clerical:

**Analysis Date:** Read Bag lot =

**Particle Fraction Being Read:** **bulk** **-mesh** **(click in cell for drop-down)**

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

Replicate reading 1

2
3
4
5 (optional)
6 (optional)
7 (optional)
8 (optional)
9 (optional)
10 (optional)

| | | | |
|---|---|---|---|
| **Mean** | NA | LOD = | #DIV/0! |
| **SD** | NA | **Ttl %RSD** | #VALUE! |
| n = | 0 | | |
| ProUCL distribution = | | | |
| 2-sided 95% t-LCL = | #VALUE! | | |
| 2-sided 95% t-UCL = | #VALUE! | | |
| 1-sided 95% t-LCL = | #VALUE! | | |
| 1-sided 95% t-UCL = | #VALUE! | | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | | |

subsampling error = #VALUE! instrument error = #DIV/0! as %RSD

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | <10-mesh |
| none | <120-mesh |
| WM A6070C5 | <80 |
| PO 321861 | |

**DU or Bag ID:** EBA DU-10B (6-24) **Element:** **Pb**

Operator: MSJ Clerical:

**Analysis Date:** 3-Nov-2017 Read Bag lot = WM A6070C5

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? | |
|---|---|---|---|---|---|---|---|
| Replicate reading 1 | 1040 | 454 | 15 | 114.6 | 5.6 | | |
| 2 | 1041 | 455 | 15 | 99.37 | 5.4 | | |
| 3 | 1041 | 456 | 15 | 92.81 | 5.1 | | |
| 4 | 1043 | 457 | 15 | 186.2 | 7.0 | | |
| 5 (optional) | 1044 | 458 | 15 | 106.6 | 5.5 | | |
| 6 (optional) | 1045 | 459 | 15 | 130.3 | 5.9 | | |
| 7 (optional) | | | | | | | |
| 8 (optional) | | | | | | | |
| 9 (optional) | | | | | | | |
| 10 (optional) | | | | | | | |
| 11 (optional) | | | | | | | |
| 12 (optional) | | | | | | | |
| | | | **Mean** | 121.6 | LOD = | 17.34 | **Original I** |
| | | | **SD** | 34.19 | **Ttl %RSD** | 28.11 | Pb |
| | | | n = | 6 | | | As |
| | | ProUCL distribution = | | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 53.3 | | | **Between-** |

| | | | | | |
|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 190.0 | | |
| | 1-sided | Bag 95% t-LCL = | 93.5 | | |
| | 1-sided | Bag 95% t-UCL = | 149.8 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 60.8 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 182.5 | | |
| subsampling error = | 27.70 | instrument error = | | 4.75 | as %RSD |

Pb
As

**Sample d**
Pb
As

**DU or Bag ID:** EBA DU-10B (6-24) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 6-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<80** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| | | | | **Fraction:** | <80-mesh | |
| Replicate reading 1 | 1135 | 704 | 15 | 112.3 | 5.6 | |
| 2 | 1136 | 705 | 15 | 101.0 | 5.4 | |
| 3 | 1137 | 706 | 15 | 98.24 | 5.40 | |
| 4 | 1138 | 707 | 15 | 101.4 | 5.3 | |
| 5 (optional) | 1138 | 708 | 15 | 90.5 | 5.2 | |
| 6 (optional) | 1139 | 709 | 15 | 95.5 | 5.3 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | 99.8 | LOD = | 16.10 |
| Hypothesis Test for | | | **SD** | 7.32 | **Ttl %RSD** | 7.3 |
| Fraction Agreement | | | n = | 6 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| 0.1820 | ver bag limit | Mean - 2 SD = | | 85.2 | | |
| Fractions same | er bag limit | Mean + 2 SD = | | 114.5 | | |
| | 2-sided | Bag 95% t-LCL = | | 92.1 | | |
| | 2-sided | Bag 95% t-UCL = | | 107.5 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | 86.8 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | 112.8 | | |
| subsampling error = | 4.98 | instrument error = | | 5.38 | as %RSD | |

**DU or Bag ID:** EBA DU-10B (6-24) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 6-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<120-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **Analyst:** | DMC | **Date:** | 11/6/2017 | **Fraction:** | <120-mesh | |
| Replicate reading 1 | 1124 | 698 | 15 | 129.4 | 6.2 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | 1127 | 699 | 15 | 126.3 | 6.1 | |
| 3 | 1128 | 700 | 15 | 128.7 | 6.2 | |
| 4 | 1129 | 701 | 15 | 123.2 | 6.20 | |
| 5 (optional) | 1132 | 702 | 15 | 147.0 | 6.5 | |
| 6 (optional) | 1132 | 703 | 15 | 124.4 | 5.9 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | 129.8 | LOD = | 18.6 |
| Hypothesis Test for | | | **SD** | 8.74 | **Ttl %RSD** | 6.7 |
| Fraction Agreement | | | n = | 6 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| 0.0001 | | 2-sided | 95% t-LCL = | 120.7 | | |
| Fractions different | | 2-sided | 95% t-UCL = | 139.0 | | |
| | | 1-sided | 95% t-LCL = | 122.6 | | |
| | | 1-sided | 95% t-UCL = | 137.0 | | |
| | | 1-sided 95% Chebyshev LCL = | | 114.3 | | |
| | | 1-sided 95% Chebyshev UCL = | | 145.4 | | |
| subsampling error = | 4.76 | | instrument error = | | 4.76 | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
nent precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | 20.5 | %RSD | triplicates | 6.7 | %RSD |

| **-1.5-g subsamples variability** | **Within-subsample bag variability** |
|---|---|

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | 13.9 | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 368.8 | 394.4 | 5.9 | 139.4 | 152.1 | 14.7 |

**DU or Bag ID:** EBA DU-10C (0-6) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 2-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1755 | 379 | 15 | 362.5 | 9.6 | |
| 2 | 1756 | 380 | 15 | 386.3 | 10.1 | |
| 3 | 1757 | 381 | 15 | 385.7 | 10.4 | |
| 4 | 1758 | 382 | 15 | 340.6 | 9.3 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 368.8 | LOD = | 29.58 |
| | | | **SD** | 21.81 | **Ttl %RSD** | 5.91 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 334.1 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2-sided | Bag 95% t-UCL = | 403.5 | | |
| | 1-sided | Bag 95% t-LCL = | 343.1 | | |
| | 1-sided | Bag 95% t-UCL = | 394.4 | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 321.2 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 416.3 | | |
| subsampling error = | | 5.27 | instrument error = | 2.67 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA DU-10C (6-24) **Element:** **Pb**

Operator: DMC Clerical:

**Analysis Date:** 2-Nov-2017 Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1646 | 348 | 15 | 130.0 | 5.8 | |
| 2 | 1646 | 349 | 15 | 166.3 | 6.60 | |
| 3 | 1647 | 350 | 15 | 139.7 | 6.20 | |
| 4 | 1648 | 351 | 15 | 152.3 | 6.60 | |
| 5 (optional) | 1648 | 352 | 15 | 108.9 | 5.60 | |
| 6 (optional) | 1649 | 353 | 15 | 119.7 | 5.80 | |
| 7 (optional) | 1650 | 354 | 15 | 121.0 | 5.90 | |
| 8 (optional) | 1651 | 355 | 15 | 158.7 | 6.60 | |
| 9 (optional) | 1652 | 356 | 15 | 158.0 | 6.50 | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 139.4 | LOD = | 18.57 |
| | | | **SD** | 20.48 | **Ttl %RSD** | 14.69 |
| | | | n = | 9 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | 98.4 | | |

**Original b**
Pb
As

**Between-**

| | | | | | | |
|---|---|---|---|---|---|---|
| +2 SD Upper bag limit | | Mean + 2 SD = | 180.4 | | | Pb |
| | 1-sided | Bag 95% t-LCL = | 126.7 | | | As |
| | 1-sided | Bag 95% t-UCL = | 152.1 | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | 109.7 | | | **Sample d** |
| | 1-sided Bag 95% Chebyshev UCL = | | 169.1 | | | Pb |
| subsampling error = | | 14.00 | instrument error = | 4.44 | as %RSD | As |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
nent precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

**-1.5-g subsamples variability** **Within-subsample bag variability**

| | | | | | |
|---|---|---|---|---|---|
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 2-Nov-2017  Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 151.9 | 162.5 | 10.5 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU-11  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1628 | 329 | 15 | 124.4 | 5.7 | |
| 2 | 1629 | 330 | 15 | 146.3 | 6.3 | |
| 3 | 1630 | 331 | 15 | 167.0 | 6.5 | |
| 4 | 1630 | 332 | 15 | 155.3 | 6.3 | |
| 5 (optional) | 1631 | 333 | 15 | 155.6 | 6.4 | |
| 6 (optional) | 1632 | 334 | 15 | 165.6 | 6.4 | |
| 7 (optional) | 1633 | 335 | 15 | 133.9 | 5.9 | |
| 8 (optional) | 1634 | 336 | 15 | 166.7 | 6.6 | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 151.9 | LOD = | 18.8 |
| | | | **SD** | 15.9 | **Ttl %RSD** | 10.48 |
| | | | n = | 8 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 138.6 | | |
| | 2-sided | Bag 95% t-UCL = | | 165.1 | | |
| | 1-sided | Bag 95% t-LCL = | | 141.2 | | |
| | 1-sided | Bag 95% t-UCL = | | 162.5 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 127.3 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 176.4 | | |
| subsampling error = | 9.63 | instrument error = | 4.13 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA DU-11 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original b**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC Clerical:

**Analysis Date:** 3-Nov-2017 Read Bag lot = WM A6070C5

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 102.4 | 111.1 | 7.2 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU 12 (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 0925 | 408 | 15 | 109.8 | 6 | |
| 2 | 0930 | 409 | 15 | 101.2 | 6 | |
| 3 | 0931 | 410 | 15 | 92.7 | 5 | |
| 4 | 0932 | 411 | 15 | 105.9 | 5 | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 102.4 | LOD = | 16.30 |
| | | | **SD** | 7.35 | **Ttl %RSD** | 7.17 |
| | | | n = | 4 | | |
| | | ProUCL distribution = | | normal | | |
| | 2-sided | Bag 95% t-LCL = | | 90.7 | | |
| | 2-sided | Bag 95% t-UCL = | | 114.1 | | |
| | 1-sided | Bag 95% t-LCL = | | 93.8 | | |
| | 1-sided | Bag 95% t-UCL = | | 111.1 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 86.4 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 118.4 | | |
| subsampling error = | 4.83 | instrument error = | 5.30 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

Read Bag lot = PO 321861

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

**DU or Bag ID:** EBA DU 12 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | normal | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 2-Nov-2017  Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 161.6 | 171.4 | 7.4 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU-13  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1052 | 267 | 15 | 180.0 | 6.9 | |
| 2 | 1053 | 268 | 15 | 153.5 | 6.2 | |
| 3 | 1054 | 269 | 15 | 159.7 | 6.4 | |
| 4 | 1054 | 270 | 15 | 145.2 | 6.2 | |
| 5 (optional) | 1055 | 271 | 15 | 165.0 | 6.4 | |
| 6 (optional) | 1056 | 272 | 15 | 166.1 | 6.5 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 161.6 | LOD = | 19.3 |
| | | | **SD** | 11.9 | **Ttl %RSD** | 7.37 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 149.1 | | |
| | 2-sided | Bag 95% t-UCL = | | 174.1 | | |
| | 1-sided | Bag 95% t-LCL = | | 151.8 | | |
| | 1-sided | Bag 95% t-UCL = | | 171.4 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 140.4 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 182.8 | | |
| subsampling error = | 6.20 | instrument error = | 3.98 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA DU-13 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original b**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC Clerical:

**Analysis Date:** 4-Nov-2017 Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 178.1 | 190.8 | 9.7 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU-14 (0-6) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 0846 | 518 | 15 | 205.5 | 6.6 | |
| 2 | 0847 | 519 | 15 | 152.7 | 6.0 | |
| 3 | 0848 | 520 | 15 | 161.2 | 6.2 | |
| 4 | 0849 | 521 | 15 | 185.7 | 6.8 | |
| 5 (optional) | 0850 | 522 | 15 | 182.0 | 6.5 | |
| 6 (optional) | 0850 | 523 | 15 | 175.4 | 6.5 | |
| 7 (optional) | 0851 | 524 | 15 | 183.9 | 6.6 | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 178.1 | LOD = | 19.4 |
| | | | **SD** | 17.3 | **Ttl %RSD** | 9.72 |
| | | | n = | 7 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 162.1 | | |
| | 2-sided | Bag 95% t-UCL = | | 194.1 | | |
| | 1-sided | Bag 95% t-LCL = | | 165.4 | | |
| | 1-sided | Bag 95% t-UCL = | | 190.8 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 149.6 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 206.6 | | |
| subsampling error = | 9.01 | instrument error = | 3.63 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA DU-14 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original b**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical: DMC

**Analysis Date:** 6-Nov-2017  Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 150.9 | 159.4 | 7.7 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU-15  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 0944 | 662 | 15 | 131.0 | 6.1 | |
| 2 | 0945 | 663 | 15 | 167.3 | 6.6 | |
| 3 | 0946 | 664 | 15 | 145.7 | 6.3 | |
| 4 | 0946 | 665 | 15 | 153.4 | 6.4 | |
| 5 (optional) | 0947 | 666 | 15 | 145.1 | 6.3 | |
| 6 (optional) | 0948 | 667 | 15 | 155.9 | 6.5 | |
| 7 (optional) | 0949 | 668 | 15 | 157.8 | 6.5 | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 150.9 | LOD = | 19.16 |
| | | | **SD** | 11.58 | **Ttl %RSD** | 7.67 |
| | | | n = | 7 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 140.2 | | |
| | 2-sided | Bag 95% t-UCL = | | 161.6 | | |
| | 1-sided | Bag 95% t-LCL = | | 142.4 | | |
| | 1-sided | Bag 95% t-UCL = | | 159.4 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 131.8 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 170.0 | | |
| subsampling error = | 6.40 | instrument error = | 4.23 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | **particle size drop-down list** |
|---|---|
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA DU-15 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **Operator:** | | **Analytical Date:** | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente

Note: LCLs = lower confidence limits; UCLs = upper confider

LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** **<10-mesh** **-mesh** **(click in cell for drop-down)**

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical: DMC

**Analysis Date:** 6-Nov-2017  Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 400.9 | 429.2 | 8.6 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU-17  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1527 | 759 | 15 | 381.0 | 9.5 | |
| 2 | 1527 | 760 | 15 | 357.5 | 9.4 | |
| 3 | 1528 | 761 | 15 | 439.8 | 10.3 | |
| 4 | 1530 | 762 | 15 | 443.6 | 10.4 | |
| 5 (optional) | 1532 | 763 | 15 | 399.5 | 9.9 | |
| 6 (optional) | 1532 | 764 | 15 | 384.2 | 9.8 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 400.9 | LOD = | 29.7 |
| | | | **SD** | 34.3 | **Ttl %RSD** | 8.6 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 364.9 | | |
| | 2-sided | Bag 95% t-UCL = | | 437.0 | | |
| | 1-sided | Bag 95% t-LCL = | | 372.7 | | |
| | 1-sided | Bag 95% t-UCL = | | 429.2 | | |

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | 339.8 | | |
| | 1-sided Bag 95% Chebyshev UCL = | 462.0 | | |
| subsampling error = | 8.20 | instrument error = | 2.47 | as %RSD |

## Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | er bag limit | Mean - 2 SD = | | #VALUE! | | |
| #DIV/0! | er bag limit | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | |
|---|---|---|
| 2-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% t-LCL = | #VALUE! | |
| 1-sided 95% t-UCL = | #VALUE! | |
| 1-sided 95% Chebyshev LCL = | #VALUE! | |
| 1-sided 95% Chebyshev UCL = | #VALUE! | |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |

| | | |
|---|---|---|
| ProUCL distribution = | | |
| 2-sided | Bag 95% t-LCL = | #VALUE! |
| 2-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided | Bag 95% t-LCL = | #VALUE! |
| 1-sided | Bag 95% t-UCL = | #VALUE! |
| 1-sided Bag 95% Chebyshev LCL = | | #VALUE! |
| 1-sided Bag 95% Chebyshev UCL = | | #VALUE! |
| subsampling error = | #VALUE! | instrument error = #DIV/0! as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|

**For duplicate sample analysis (repeat analysis of same bag)**

| | | | | | | |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCL
nce limits. The spreadsheet partitions data error between analytical (XRF instrur

**' comparability analysis.**

| | |
|---|---|
| | **particle size drop-down list** |
| **Bag Lots d-d list** | bulk |
| none | <10-mesh |
| WM A6070C5 | <100-mesh |
| PO 321861 | |

**DU or Bag ID:** EBA DU-17 (6-24) **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **Operator:** | | **Analytical Date:** | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| -2SD Lower bag limit | | Mean - 2 SD = | | #VALUE! | | |
| +2 SD Upper bag limit | | Mean + 2 SD = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |

**Original l**
Pb
As

**Between-**
Pb
As

| | | | | |
|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| subsampling error = | #VALUE! | instrument error = | #DIV/0! | as %RSD |

**Sample d**
Pb
As

# Duplicate Bag Analysis

**Run by:** **Run date:**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| Hypothesis Test for | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Duplicate Agreement | | | n = | 0 | | |
| T-test p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | ver bag limit | Mean - 2 SD = | #VALUE! | | | |
| #DIV/0! | ɔer bag limit | Mean + 2 SD = | #VALUE! | | | |
| | 1-sided | Bag 95% t-LCL = | #VALUE! | | | |
| | 1-sided | Bag 95% t-UCL = | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev LCL = | | #VALUE! | | | |
| | 1-sided Bag 95% Chebyshev UCL = | | #VALUE! | | | |
| subsampling error = | #VALUE! | instrument error = | | | #DIV/0! | as %RSD |

| Dup or Trip Rdg Set 1 of 1 | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | | 2-sided | 95% t-LCL = | #VALUE! | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 2-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% t-LCL = | #VALUE! | | |
| | | | 1-sided 95% t-UCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | LOD = | #DIV/0! |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | | ProUCL distribution = | | | |
| | | 2-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 2-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-LCL = | #VALUE! | | |
| | | 1-sided | Bag 95% t-UCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev LCL = | #VALUE! | | |
| | | | 1-sided Bag 95% Chebyshev UCL = | #VALUE! | | |
| | subsampling error = | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

**Bag ID:** **Element:**

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Sample or Location ID = | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| **For duplicate sample analysis (repeat analysis of same bag)** | | | | | | |
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| Hypothesis | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| Test for Duplicate | | | n = | 0 | | |
| Agreement, p-value = | | ProUCL distribution = | | | | |
| #DIV/0! | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| #DIV/0! | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | | #VALUE! | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

| Replicate Bag Readings | Date & Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 (optional) | | | | | | |
| 6 (optional) | | | | | | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| | | | **Mean** | NA | | |
| | | | **SD** | NA | **Ttl %RSD** | #VALUE! |
| | | | n = | 0 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 2-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-LCL = | | #VALUE! | | |
| | 1-sided | Bag 95% t-UCL = | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev LCL = | | | #VALUE! | | |
| | 1-sided Bag 95% Chebyshev UCL = | | | #VALUE! | | |
| subsampling error = | #VALUE! | | instrument error = | | #DIV/0! | as %RSD |

.s and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs
ment precision) and sampling error (data variability due to matrix heterogeneit

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| | | | | | |
|---|---|---|---|---|---|
| **bag: within-sample bag variability** | | | **Replicate readings: analytical variability** | | |
| move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |
| **-1.5-g subsamples variability** | | | **Within-subsample bag variability** | | |
| var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**luplicate mean variability**

| | | |
|---|---|---|
| var betw means | #DIV/0! | %RSD |
| of 2 ind. analyses | #DIV/0! | %RSD |

s and UCLs (for non-normal data).

**RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF ins**

sheet PW = XRF

When the XRF result and instrument error (as 1 SD) are ente
Note: LCLs = lower confidence limits; UCLs = upper confider
LOD = sample-specific limit of detection

**This sheet records XRF concentration results for DU bags & for subsamples for**

**Project:** Wilcox Oil Site Pb Delineation

**Property ID:** **EBA**

**Particle Fraction Being Read:** <10-mesh -mesh (click in cell for drop-down)

Instrument: TIIB Niton GOLDD Ultra (S/N 92959)

Operator: DMC  Clerical:

**Analysis Date:** 4-Nov-2017  Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

| (0-6) Pb mean | UCL | %RSD | (6-24) mean | UCL | %RSD |
|---|---|---|---|---|---|
| 385.8 | 406.6 | 6.6 | NA | #VALUE! | #VALUE! |

**DU or Bag ID:** EBA DU-6  (0-6)  **Element:** **Pb**

| Replicate Bag Readings | Time | Reading No. | Run Time (sec) | Instrument Result (ppm) | Instrument Error (as 1 Std Dev) | Note? |
|---|---|---|---|---|---|---|
| Replicate reading 1 | 1702 | 598 | 15 | 410.0 | 10.4 | |
| 2 | 1704 | 599 | 15 | 406.0 | 10.3 | |
| 3 | 1704 | 600 | 15 | 388.8 | 9.0 | |
| 4 | 1705 | 601 | 15 | 338.9 | 9.3 | |
| 5 (optional) | 1706 | 602 | 15 | 385.1 | 10.2 | |
| 6 (optional) | 1707 | 603 | 15 | 385.7 | 9.8 | |
| 7 (optional) | | | | | | |
| 8 (optional) | | | | | | |
| 9 (optional) | | | | | | |
| 10 (optional) | | | | | | |
| 11 (optional) | | | | | | |
| 12 (optional) | | | | | | |
| | | | **Mean** | 385.8 | LOD = | 29.5 |
| | | | **SD** | 25.3 | **Ttl %RSD** | 6.56 |
| | | | n = | 6 | | |
| | | ProUCL distribution = | | | | |
| | 2-sided | Bag 95% t-LCL = | | 359.2 | | |
| | 2-sided | Bag 95% t-UCL = | | 412.3 | | |
| | 1-sided | Bag 95% t-LCL = | | 364.9 | | |
| | 1-sided | Bag 95% t-UCL = | | 406.6 | | |

| | | | | | |
|---|---|---|---|---|---|
| | 1-sided Bag 95% Chebyshev LCL = | | 340.7 | | |
| | 1-sided Bag 95% Chebyshev UCL = | | 430.8 | | |
| subsampling error = | 6.04 | instrument error = | | 2.55 | as %RSD |

**struments capable of reporting & nd error as 1 SD**

ered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t L

nce limits. The spreadsheet partitions data error between analytical (XRF ins

**comparability analysis.**

**RTeX Form: Partitioning of Variability for XRF Sample Analysis**

| **Original bag: within-sample bag variability** | | | | **Replicate readings: analytical variability** | | |
|---|---|---|---|---|---|---|
| Pb | move betw rdgs | #VALUE! | %RSD | no-move-betw rdgs | #VALUE! | %RSD |
| As | ave of 2 dups | #VALUE! | %RSD | triplicates | #VALUE! | %RSD |

| **Between-1.5-g subsamples variability** | | | | **Within-subsample bag variability** | | |
|---|---|---|---|---|---|---|
| Pb | var betw 2 sub- | #DIV/0! | %RSD | ave RSD of 2 sub- | #VALUE! | %RSD |
| As | sample means | #DIV/0! | %RSD | sample RSDs | #VALUE! | %RSD |

**Sample duplicate mean variability**

| | | | |
|---|---|---|---|
| Pb | var betw means | #DIV/0! | %RSD |
| As | of 2 ind. analyses | #DIV/0! | %RSD |

LCLs and UCLs (for data with a normal distribution) and 1-sided Chebyshe
trument precision) and sampling error (data variability due to matrix heter

ɘv LCLs and UCLs (for non-normal data).

| ID | 0-6 Mean | 0-6 UCL | 6-24 Mean | 6-24 UCL |
|---|---|---|---|---|
| EBA PSA2 side | 215.82 | 226.83 | 93.52 | 100.01 |
| EBA PSA1 | 850.95 | 930.13 | 422.51 | 445.63 |
| EBA North Transect | 378.34 | 404.41 | NA | #VALUE! |
| EBA South Transect | 299.43 | 308.90 | NA | #VALUE! |
| EBA SU 1 | 396.59 | 431.03 | 18.32 | 22.01 |
| EBA SU2 | 454.72 | 610.12 | 72.36 | 80.09 |
| EBA DU-1A | 203.28 | 217.91 | 35.34 | 40.91 |
| EBA DU-1B | 161.22 | 172.72 | NA | #VALUE! |
| EBA DU-1C | 166.15 | 172.70 | NA | #VALUE! |
| EBA SUS 100 | 90.54 | 94.76 | NA | #VALUE! |
| EBA SUS 101 | 80.93 | 90.91 | NA | #VALUE! |
| EBA SUS 102 | 87.36 | 96.39 | NA | #VALUE! |
| EBA SUT 1,1 | 368.70 | 388.13 | 123.59 | 137.96 |
| EBA SUT 1,2 | 385.03 | 409.28 | NA | #VALUE! |
| EBA SUT 1,3 | 399.83 | 421.06 | 162.83 | 204.31 |
| EBA SUT 1,4 | 362.55 | 386.79 | NA | #VALUE! |
| EBA SUT 1,5 | 462.33 | 555.61 | NA | #VALUE! |
| EBA DU2A | 151.28 | 154.20 | 46.52 | 50.29 |
| EBA DU2B | 152.10 | 167.33 | NA | #VALUE! |
| EBA DU2C | 155.40 | 172.58 | NA | #VALUE! |
| EBA DU3 | 325.52 | 353.07 | 206.83 | 228.91 |
| EBA DU 4 | 186.53 | 204.40 | 67.62 | 71.33 |
| EBA DU-5 | 782.30 | 1212.71 | 0.00 | 0.00 |
| EBA DU 6 | 257.70 | 269.97 | 56.15 | 83.65 |
| EBA DU7 | 180.74 | 188.85 | NA | #VALUE! |
| EBA DU 8 | 319.50 | 364.87 | NA | #VALUE! |
| EBA DU9 | 1202.60 | 1382.58 | NA | #VALUE! |
| EBA DU-10A | 327.98 | 335.36 | 129.25 | 134.32 |
| EBA DU-10B | 355.50 | 367.74 | 121.65 | 149.78 |
| EBA DU-10C | 368.78 | 394.44 | 139.40 | 152.09 |
| EBA DU-11 | 151.85 | 162.51 | NA | #VALUE! |
| EBA DU 12 | 102.41 | 111.05 | NA | #VALUE! |
| EBA DU-13 | 161.58 | 171.38 | NA | #VALUE! |
| EBA DU-14 | 178.06 | 190.76 | NA | #VALUE! |
| EBA DU-15 | 150.89 | 159.39 | NA | #VALUE! |
| EBA DU-17 | 400.93 | 429.18 | NA | #VALUE! |
| EBA DU-16 | 385.75 | 406.57 | NA | #VALUE! |
| EBA DU-5 <120 | 874.20 | 839.40 | #REF! | #REF! |
| EBA DU-5 <80 | 708.03 | 688.90 | #REF! | #REF! |
| EBA DU 10B <80 | | | 99.82 | 93.8 |
| EBA DU 10B <120 | | | 129.83 | 122.6 |