



Donny Juarez
Energy Laboratories
2393 Salt Creek Hwy
Casper, WY 82601
USA

SOIL-113  **Final Report**

Soil/Hazardous Waste Proficiency Testing

Soil Study

Open Date: 01/25/21

Close Date: 03/11/21

Report Issued Date: 03/15/21



A Waters Company

March 15, 2021

Donny Juarez
Energy Laboratories
2393 Salt Creek Hwy
Casper, WY 82601

Enclosed is your final report for ERA's SOIL-113 Proficiency Testing (PT) study. Your final report includes an evaluation of all results submitted by your laboratory to ERA.

Data Evaluation Protocols: All analytes in ERA's SOIL-113 Proficiency Testing study have been evaluated using the following tiered approach. If the analyte is listed in the most current NELAC Fields of Proficiency Testing (FoPT) table the evaluation was completed by comparing the reported result to the acceptance limits generated using the criteria contained in the table and the evaluation criteria contained in the 2016 TNI Standard, Volume 3. If the analyte is not included in the NELAC FoPT table, the reported result has been evaluated using the procedures outlined in ERA's Standard Operating Procedure for the Generation of Performance Acceptance Limits (SOP 730002268).

Corrective Action Help: As part of your accreditation(s), you may be required to identify the root cause of any "Not Acceptable" results, implement the necessary corrective actions, and then satisfy your PT requirements by participating in a Supplemental (QuiK™ Response) or future ERA PT study. ERA's technical staff is available to help your laboratory resolve any technical issues that may be impairing your PT performance and possibly affecting your routine data quality. Our laboratory and technical staff have many years of collective experience in performing the full range of environmental analyses. As part of our technical support, ERA offers QC samples that can be useful in helping you work through your technical issues.

Thank you for your participation in ERA's SOIL-113 Proficiency Testing study. If you have any questions, please contact our Proficiency Testing Department at 1-800-372-0122.

Sincerely,

A handwritten signature in black ink, appearing to read "Matthew Seebeck".

Matthew Seebeck
Quality Officer

attachments



A Waters Company

| Report Recipient | Contact/Phone Number | Reporting Type |
|------------------|-----------------------------|----------------|
| Florida | Vanessa Soto / 904-791-1599 | All Analytes |



SOIL-113 Definitions & Study Discussion

Study Dates: 01/25/21 - 03/11/21

Report Issued: 03/15/21

SOIL Study Definitions

The Reported Value is the value that the laboratory reported to ERA.

The ERA Assigned Values are compliant with the most current NELAC Fields of Proficiency Testing (FoPT) table. The Assigned Values for the Organic Proficiency Testing Standards are equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation as applicable. The assigned values for the Inorganic Proficiency Testing Standards, with the exception of the TCLP Metals in Soil and Total Organic Carbon (TOC) in the Nutrients in Soil sample, are equal to the maximum amount of the parameter available in the standard by applicable EPA methodologies. The assigned values for the TCLP metals and TOC are equal to the mean of the study data, after the removal of outliers. All parameters not added to the standard are given an Assigned Value of "< PTRL", per the guidelines contained in the 2016 TNI Standard. The assigned values are directly traceable to the commercially prepared starting materials used to manufacture the PT standards.

The Acceptance Limits are established per the criteria contained in the most current NELAC FoPT table or ERA's SOP for the Generation of Performance Acceptance Limits™ as applicable.

The Performance Evaluation:

Acceptable = Reported Value falls within the Acceptance Limits.

Not Acceptable = Reported Value falls outside the Acceptance Limits.

No Evaluation = Reported Value cannot be evaluated.

Not Reported = No Value reported.

The Method Description is the method the laboratory reported to ERA.

SOIL Study Discussion

ERA's SOIL-113 Proficiency Testing (PT) study has been reviewed by ERA senior management and certified compliant with the requirements of the 2016 TNI Standard and the criteria contained in the most current NELAC Fields of Proficiency Testing (FoPT) table.

ERA's SOIL-113 study standards were examined for any anomalies. A full review of all homogeneity, stability and accuracy verification data was completed. All analytical verification data for all analytes in the standards met the acceptance criteria contained in the 2016 TNI Standard and the criteria contained in the most current NELAC FoPT table.

The data submitted by participating laboratories was also examined for study anomalies. There were no anomalies observed during the statistical review of the data.

ERA's SOIL-113 Proficiency Testing study reports shall not be reproduced except in its entirety and not without the permission of the participating laboratory. The report must not be used by the participating laboratories to claim product endorsement any agency of the U. S. government.

The data contained herein are confidential and intended for your use only.

If you have any questions or concerns regarding your assessment in ERA's SOIL Proficiency Testing program, please contact our Proficiency Testing Department at 1-800-372-0122.





A Waters Company

SOIL-113 Laboratory Exception Report

Donny Juarez
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Casper, WY 82601
307-235-0515 x3244

EPA ID:
ERA Customer Number:
Report Issued:
Study Dates:

WY00002
E772828
03/15/21
01/25/21 - 03/11/21

Not Acceptable Evaluations

| TNI Analyte Code | Analyte | Units | Reported Value | Assigned Value | Acceptance Limits | Performance Evaluation | Method Description |
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|

SOIL Metals in Soil (cat# 620, lot# D113-540)

| | | | | | | | |
|------|------|-------|-----|-----|------------|----------------|------------------|
| 1075 | Lead | mg/kg | 163 | 122 | 88.3 - 158 | Not Acceptable | EPA 6010B 2 1996 |
|------|------|-------|-----|-----|------------|----------------|------------------|



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.





Final Report Results For Laboratory Energy Laboratories

All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.

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Study # : SOIL-113





Final Evaluation Report

Study: **SOIL-113**

ERA Customer Number: **E772828**

Laboratory Name: **Energy Laboratories**

Inorganic Results



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.

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Study # : SOIL-113





SOIL-113 Final Evaluation Report

A Waters Company

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307-235-0515 x3244

EPA ID:
ERA Customer Number:
Report Issued:
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WY00002
E772828
03/15/21
01/25/21 - 03/11/21

| TNI Analyte Code | Analyte | Units | Reported Value | Assigned Value | Acceptance Limits | Performance Evaluation | Method Description | Analysis Date | Z Score | Study Mean | Study Standard Deviation | Analyst Name |
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|

SOIL Metals in Soil (cat# 620, lot# D113-540)

| | | | | | | | | | | | | |
|------|------------|-------|-------|-------|--------------|----------------|------------------|-----------|--------|-------|------|-----|
| 1000 | Aluminum | mg/kg | 8716 | 10100 | 4370 - 12900 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.0494 | 8630 | 1770 | meh |
| 1005 | Antimony | mg/kg | 76.1 | 256 | 25.6 - 323 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | -0.621 | 129 | 85.1 | meh |
| 1010 | Arsenic | mg/kg | 97 | 91.6 | 59.2 - 110 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 1.44 | 84.5 | 8.70 | meh |
| 1015 | Barium | mg/kg | 300 | 259 | 187 - 311 | Acceptable | EPA 6010B 2 1996 | 2/2/2021 | 2.21 | 249 | 23.2 | meh |
| 1020 | Beryllium | mg/kg | 183 | 175 | 122 - 204 | Acceptable | EPA 6010B 2 1996 | 2/4/2021 | 1.50 | 163 | 13.3 | meh |
| 1025 | Boron | mg/kg | 86 | 95.7 | 48.0 - 107 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.820 | 76.7 | 11.3 | meh |
| 1030 | Cadmium | mg/kg | 107 | 107 | 74.2 - 124 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.915 | 99.0 | 8.76 | meh |
| 1035 | Calcium | mg/kg | 5382 | 5190 | 3460 - 6070 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 1.39 | 4760 | 448 | meh |
| 1040 | Chromium | mg/kg | 135 | 129 | 85.7 - 159 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 1.03 | 122 | 12.2 | meh |
| 1050 | Cobalt | mg/kg | 66.9 | 63.6 | 46.3 - 77.2 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.912 | 61.7 | 5.67 | meh |
| 1055 | Copper | mg/kg | 65 | 62.3 | 46.1 - 76.8 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.578 | 61.5 | 6.14 | meh |
| 1070 | Iron | mg/kg | 14640 | 15000 | 5190 - 23800 | Acceptable | EPA 6010B 2 1996 | 2/1/2021 | 0.0505 | 14500 | 3270 | meh |
| 1075 | Lead | mg/kg | 163 | 122 | 88.3 - 158 | Not Acceptable | EPA 6010B 2 1996 | 2/2/2021 | 2.70 | 123 | 14.7 | meh |
| 1080 | Lithium | mg/kg | | 6.42 | 3.20 - 11.4 | Not Reported | | | | 7.30 | 1.37 | |
| 1085 | Magnesium | mg/kg | 2563 | 2570 | 1480 - 3250 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.685 | 2360 | 290 | meh |
| 1090 | Manganese | mg/kg | 493 | 470 | 350 - 563 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.875 | 456 | 41.8 | meh |
| 1095 | Mercury | mg/kg | | 22.1 | 11.3 - 26.4 | Not Reported | | | | 18.9 | 2.71 | |
| 1100 | Molybdenum | mg/kg | 77.1 | 80.1 | 50.5 - 95.2 | Acceptable | EPA 6010B 2 1996 | 2/2/2021 | 0.494 | 72.8 | 8.63 | meh |
| 1105 | Nickel | mg/kg | 152 | 143 | 94.7 - 176 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 1.27 | 135 | 13.1 | meh |
| 1125 | Potassium | mg/kg | 2149 | 2420 | 1240 - 2940 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.173 | 2090 | 331 | meh |



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.





SOIL-113 Final Evaluation Report

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307-235-0515 x3244

EPA ID:
ERA Customer Number:
Report Issued:
Study Dates:

WY00002
E772828
03/15/21
01/25/21 - 03/11/21

| TNI Analyte Code | Analyte | Units | Reported Value | Assigned Value | Acceptance Limits | Performance Evaluation | Method Description | Analysis Date | Z Score | Study Mean | Study Standard Deviation | Analyst Name |
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|

SOIL Metals in Soil (cat# 620, lot# D113-540) (Continued)

| | | | | | | | | | | | | |
|------|-----------|-------|------|------|-------------|--------------|------------------|-----------|-------|------|------|-----|
| 1140 | Selenium | mg/kg | 137 | 128 | 80.4 - 162 | Acceptable | EPA 6010B 2 1996 | 2/4/2021 | 1.41 | 121 | 11.1 | meh |
| 1150 | Silver | mg/kg | 45.4 | 45.4 | 30.7 - 57.6 | Acceptable | EPA 6010B 2 1996 | 2/4/2021 | 0.210 | 44.1 | 5.96 | meh |
| 1155 | Sodium | mg/kg | 178 | 161 | 48.1 - 223 | Acceptable | EPA 6010B 2 1996 | 2/2/2021 | 1.61 | 136 | 26.4 | meh |
| 1160 | Strontium | mg/kg | 92 | 82.2 | 58.6 - 106 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 1.29 | 82.3 | 7.57 | meh |
| 1165 | Thallium | mg/kg | | 154 | 101 - 187 | Not Reported | | | | 144 | 13.7 | |
| 1175 | Tin | mg/kg | 90.7 | 89.7 | 43.5 - 116 | Acceptable | EPA 6010B 2 1996 | 2/2/2021 | 0.952 | 79.8 | 11.5 | meh |
| 1180 | Titanium | mg/kg | 583 | 705 | 118 - 974 | Acceptable | EPA 6010B 2 1996 | 2/2/2021 | 0.259 | 546 | 143 | meh |
| 3055 | Uranium | mg/kg | | 29.5 | 21.3 - 40.5 | Not Reported | | | | 30.9 | 3.19 | |
| 1185 | Vanadium | mg/kg | 201 | 196 | 138 - 235 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.743 | 186 | 19.6 | meh |
| 1190 | Zinc | mg/kg | 319 | 307 | 207 - 384 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.859 | 295 | 27.4 | meh |



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.





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|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|

SOIL Metals in Soil (cat# 620, lot# D113-540)

| | | | | | | | | | | | | |
|------|------------|-------|-------|-------|--------------|--------------|------------------|----------|---------|-------|------|-----|
| 1000 | Aluminum | mg/kg | 8364 | 10100 | 4370 - 12900 | Acceptable | EPA 6020A 1 2007 | 2/9/2021 | -0.150 | 8630 | 1770 | srm |
| 1005 | Antimony | mg/kg | 70 | 256 | 25.6 - 323 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | -0.693 | 129 | 85.1 | srm |
| 1010 | Arsenic | mg/kg | 88.6 | 91.6 | 59.2 - 110 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.470 | 84.5 | 8.70 | srm |
| 1015 | Barium | mg/kg | 267 | 259 | 187 - 311 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.788 | 249 | 23.2 | srm |
| 1020 | Beryllium | mg/kg | 162 | 175 | 122 - 204 | Acceptable | EPA 6020A 1 2007 | 2/9/2021 | -0.0779 | 163 | 13.3 | srm |
| 1025 | Boron | mg/kg | 70.2 | 95.7 | 48.0 - 107 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | -0.575 | 76.7 | 11.3 | srm |
| 1030 | Cadmium | mg/kg | 105 | 107 | 74.2 - 124 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.687 | 99.0 | 8.76 | srm |
| 1035 | Calcium | mg/kg | 5056 | 5190 | 3460 - 6070 | Acceptable | EPA 6020A 1 2007 | 2/9/2021 | 0.658 | 4760 | 448 | srm |
| 1040 | Chromium | mg/kg | 123 | 129 | 85.7 - 159 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.0445 | 122 | 12.2 | srm |
| 1050 | Cobalt | mg/kg | 63.5 | 63.6 | 46.3 - 77.2 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.313 | 61.7 | 5.67 | srm |
| 1055 | Copper | mg/kg | 64.5 | 62.3 | 46.1 - 76.8 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.496 | 61.5 | 6.14 | srm |
| 1070 | Iron | mg/kg | 14170 | 15000 | 5190 - 23800 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | -0.0932 | 14500 | 3270 | srm |
| 1075 | Lead | mg/kg | 129 | 122 | 88.3 - 158 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.381 | 123 | 14.7 | srm |
| 1080 | Lithium | mg/kg | | 6.42 | 3.20 - 11.4 | Not Reported | | | | 7.30 | 1.37 | |
| 1085 | Magnesium | mg/kg | 2271 | 2570 | 1480 - 3250 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | -0.323 | 2360 | 290 | srm |
| 1090 | Manganese | mg/kg | 485 | 470 | 350 - 563 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.683 | 456 | 41.8 | srm |
| 1095 | Mercury | mg/kg | | 22.1 | 11.3 - 26.4 | Not Reported | | | | 18.9 | 2.71 | |
| 1100 | Molybdenum | mg/kg | 72.5 | 80.1 | 50.5 - 95.2 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | -0.0388 | 72.8 | 8.63 | srm |
| 1105 | Nickel | mg/kg | 143 | 143 | 94.7 - 176 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.586 | 135 | 13.1 | srm |
| 1125 | Potassium | mg/kg | 1920 | 2420 | 1240 - 2940 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | -0.518 | 2090 | 331 | srm |



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.





SOIL-113 Final Evaluation Report

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WY00002
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| TNI Analyte Code | Analyte | Units | Reported Value | Assigned Value | Acceptance Limits | Performance Evaluation | Method Description | Analysis Date | Z Score | Study Mean | Study Standard Deviation | Analyst Name |
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|

SOIL Metals in Soil (cat# 620, lot# D113-540) (Continued)

| | | | | | | | | | | | | |
|------|-----------|-------|------|------|-------------|------------|------------------|-----------|--------|------|------|-----|
| 1140 | Selenium | mg/kg | 129 | 128 | 80.4 - 162 | Acceptable | EPA 6020A 1 2007 | 2/9/2021 | 0.690 | 121 | 11.1 | srm |
| 1150 | Silver | mg/kg | 46.2 | 45.4 | 30.7 - 57.6 | Acceptable | EPA 6020A 1 2007 | 2/9/2021 | 0.344 | 44.1 | 5.96 | srm |
| 1155 | Sodium | mg/kg | 104 | 161 | 48.1 - 223 | Acceptable | EPA 6020A 1 2007 | 2/10/2021 | -1.20 | 136 | 26.4 | srm |
| 1160 | Strontium | mg/kg | 87.1 | 82.2 | 58.6 - 106 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.640 | 82.3 | 7.57 | srm |
| 1165 | Thallium | mg/kg | 149 | 154 | 101 - 187 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.372 | 144 | 13.7 | srm |
| 1175 | Tin | mg/kg | 86.2 | 89.7 | 43.5 - 116 | Acceptable | EPA 6020A 1 2007 | 2/5/2021 | 0.559 | 79.8 | 11.5 | srm |
| 1180 | Titanium | mg/kg | 508 | 705 | 118 - 974 | Acceptable | EPA 6020A 1 2007 | 2/9/2021 | -0.266 | 546 | 143 | srm |
| 3055 | Uranium | mg/kg | 28 | 29.5 | 21.3 - 40.5 | Acceptable | EPA 6020A 1 2007 | 2/9/2021 | -0.916 | 30.9 | 3.19 | srm |
| 1185 | Vanadium | mg/kg | 182 | 196 | 138 - 235 | Acceptable | EPA 6020A 1 2007 | 2/9/2021 | -0.228 | 186 | 19.6 | srm |
| 1190 | Zinc | mg/kg | 319 | 307 | 207 - 384 | Acceptable | EPA 6020A 1 2007 | 2/9/2021 | 0.859 | 295 | 27.4 | srm |

SOIL Nutrients in Soil (cat# 869, lot# D113-542)

| | | | | | | | | | | | | |
|------|----------------------------|-------|------|------|-------------|--------------|------------------|-----------|-------|------|------|-----|
| 1515 | Ammonia as N | mg/kg | | 1210 | 665 - 1510 | Not Reported | | | | 1090 | 108 | |
| 1795 | Total Kjeldahl Nitrogen | mg/kg | | 1720 | 944 - 2460 | Not Reported | | | | 1700 | 232 | |
| 2040 | Total Organic Carbon (TOC) | mg/kg | | 4690 | 1610 - 7770 | Not Reported | | | | 4690 | 1030 | |
| 1910 | Total Phosphorus | mg/kg | 1665 | 1710 | 439 - 2690 | Acceptable | EPA 6010B 2 1996 | 1/29/2021 | 0.639 | 1570 | 155 | meh |



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.





Final Evaluation Report

Study: **SOIL-113**

ERA Customer Number: **E772828**

Laboratory Name: **Energy Laboratories**

Organic Results



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.

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Study # : SOIL-113





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| TNI Analyte Code | Analyte | Units | Reported Value | Assigned Value | Acceptance Limits | Performance Evaluation | Method Description | Analysis Date | Z Score | Study Mean | Study Standard Deviation | Analyst Name |
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|

SOIL Ready-to-Use VOAs in Soil (cat# 870, lot# D113-924)

| | | | | | | | | | | | | |
|------|--------------------------------|-------|--------|--------|--------------|------------|------------------|----------|---------|-------|------|-----|
| 4315 | Acetone | µg/kg | 12400 | 12200 | 3420 - 18700 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.0283 | 12300 | 1980 | adw |
| 4320 | Acetonitrile | µg/kg | < 8000 | < 4000 | 0.00 - 4000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4325 | Acrolein | µg/kg | < 8000 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4375 | Benzene | µg/kg | < 750 | < 750 | 0.00 - 750 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4385 | Bromobenzene | µg/kg | < 400 | < 2000 | 0.00 - 2000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4390 | Bromochloromethane | µg/kg | < 200 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4395 | Bromodichloromethane | µg/kg | < 650 | < 650 | 0.00 - 650 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4400 | Bromoform | µg/kg | 3739 | 3690 | 2210 - 5170 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.335 | 3570 | 519 | adw |
| 4950 | Bromomethane | µg/kg | < 200 | < 2000 | 0.00 - 2000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4410 | 2-Butanone (MEK) | µg/kg | 13060 | 14500 | 4020 - 22100 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.794 | 14800 | 2160 | adw |
| 4435 | n-Butylbenzene | µg/kg | < 721 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4440 | sec-Butylbenzene | µg/kg | < 400 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4445 | tert-Butylbenzene | µg/kg | < 400 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 5000 | tert-Butyl methyl ether (MTBE) | µg/kg | 7161 | 7760 | 5430 - 10100 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -1.36 | 8200 | 759 | adw |
| 4450 | Carbon disulfide | µg/kg | < 200 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4455 | Carbon tetrachloride | µg/kg | 1335 | 1350 | 711 - 2010 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.0331 | 1340 | 223 | adw |
| 4475 | Chlorobenzene | µg/kg | < 750 | < 750 | 0.00 - 750 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4575 | Chlorodibromomethane | µg/kg | < 700 | < 700 | 0.00 - 700 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4485 | Chloroethane | µg/kg | < 200 | < 2000 | 0.00 - 2000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4500 | 2-Chloroethylvinylether | µg/kg | < 400 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |



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Casper, WY 82601
307-235-0515 x3244

EPA ID:
ERA Customer Number:
Report Issued:
Study Dates:

WY00002
E772828
03/15/21
01/25/21 - 03/11/21

| TNI Analyte Code | Analyte | Units | Reported Value | Assigned Value | Acceptance Limits | Performance Evaluation | Method Description | Analysis Date | Z Score | Study Mean | Study Standard Deviation | Analyst Name |
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|
|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|

SOIL Ready-to-Use VOAs in Soil (cat# 870, lot# D113-924) (Continued)

| | | | | | | | | | | | | |
|------|------------------------------------|-------|--------|--------|--------------|------------|------------------|----------|----------|------|------|-----|
| 4505 | Chloroform | µg/kg | 6760 | 6470 | 4530 - 8410 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.178 | 6620 | 783 | adw |
| 4960 | Chloromethane | µg/kg | < 200 | < 2000 | 0.00 - 2000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4535 | 2-Chlorotoluene | µg/kg | < 400 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4540 | 4-Chlorotoluene | µg/kg | < 400 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4570 | 1,2-Dibromo-3-chloropropane (DBCP) | µg/kg | < 1200 | < 1200 | 0.00 - 1200 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4585 | 1,2-Dibromoethane (EDB) | µg/kg | 4178 | 4580 | 2750 - 6410 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.846 | 4530 | 421 | adw |
| 4595 | Dibromomethane | µg/kg | < 1200 | < 1200 | 0.00 - 1200 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4610 | 1,2-Dichlorobenzene | µg/kg | 6736 | 6660 | 5000 - 8320 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.00601 | 6740 | 657 | adw |
| 4615 | 1,3-Dichlorobenzene | µg/kg | 2438 | 2560 | 1890 - 3260 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.343 | 2540 | 299 | adw |
| 4620 | 1,4-Dichlorobenzene | µg/kg | 6384 | 6310 | 4860 - 7680 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.0792 | 6340 | 578 | adw |
| 4625 | Dichlorodifluoromethane (Freon 12) | µg/kg | < 200 | < 2000 | 0.00 - 2000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4630 | 1,1-Dichloroethane | µg/kg | 6669 | 7480 | 4860 - 10100 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.529 | 7120 | 847 | adw |
| 4635 | 1,2-Dichloroethane | µg/kg | 8638 | 9340 | 7100 - 11600 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.705 | 9460 | 1170 | adw |
| 4640 | 1,1-Dichloroethylene | µg/kg | 6199 | 6520 | 3260 - 9780 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.689 | 6980 | 1130 | adw |
| 4645 | cis-1,2-Dichloroethylene | µg/kg | 2697 | 2590 | 1550 - 3630 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.152 | 2650 | 306 | adw |
| 4700 | trans-1,2-Dichloroethylene | µg/kg | 8105 | 8560 | 5140 - 12000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.756 | 9020 | 1210 | adw |
| 4655 | 1,2-Dichloropropane | µg/kg | 3821 | 4200 | 2940 - 5460 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -1.30 | 4320 | 385 | adw |
| 4660 | 1,3-Dichloropropane | µg/kg | < 400 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4665 | 2,2-Dichloropropane | µg/kg | < 200 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4670 | 1,1-Dichloropropene | µg/kg | < 400 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |



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SOIL Ready-to-Use VOAs in Soil (cat# 870, lot# D113-924) (Continued)

| | | | | | | | | | | | | |
|------|-----------------------------|-------|--------|--------|--------------|--------------|------------------|----------|---------|------|------|-----|
| 4680 | cis-1,3-Dichloropropylene | µg/kg | < 1200 | < 1200 | 0.00 - 1200 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4685 | trans-1,3-Dichloropropylene | µg/kg | < 1200 | < 1200 | 0.00 - 1200 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4765 | Ethylbenzene | µg/kg | 2619 | 2600 | 1820 - 3380 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.0620 | 2640 | 260 | adw |
| 4835 | Hexachlorobutadiene | µg/kg | < 400 | < 150 | 0.00 - 150 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4840 | Hexachloroethane | µg/kg | | < 150 | 0.00 - 150 | Not Reported | | | | | | |
| 4860 | 2-Hexanone | µg/kg | < 4000 | < 2000 | 0.00 - 2000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4900 | Isopropylbenzene | µg/kg | < 400 | < 2000 | 0.00 - 2000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4910 | 4-Isopropyltoluene | µg/kg | < 200 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 4975 | Methylene chloride | µg/kg | 4953 | 5500 | 3300 - 7700 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.781 | 5510 | 712 | adw |
| 4995 | 4-Methyl-2-pentanone (MIBK) | µg/kg | < 8000 | < 2000 | 0.00 - 2000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 5005 | Naphthalene | µg/kg | 6488 | 7090 | 4490 - 9530 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.596 | 7160 | 1120 | adw |
| 5015 | Nitrobenzene | µg/kg | | 7960 | 1670 - 9000 | Not Reported | | | | 5340 | 1940 | |
| 5090 | n-Propylbenzene | µg/kg | < 400 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 5100 | Styrene | µg/kg | 8733 | 7740 | 4640 - 10800 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.776 | 8120 | 785 | adw |
| 5105 | 1,1,1,2-Tetrachloroethane | µg/kg | 8097 | 8130 | 6050 - 10200 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.239 | 8280 | 770 | adw |
| 5110 | 1,1,2,2-Tetrachloroethane | µg/kg | 3684 | 3780 | 2070 - 5310 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.253 | 3780 | 390 | adw |
| 5115 | Tetrachloroethylene | µg/kg | 2508 | 2410 | 1690 - 3340 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.154 | 2460 | 292 | adw |
| 5140 | Toluene | µg/kg | 9124 | 8430 | 6320 - 10500 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.524 | 8690 | 823 | adw |
| 5150 | 1,2,3-Trichlorobenzene | µg/kg | < 400 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 5155 | 1,2,4-Trichlorobenzene | µg/kg | 2771 | 2720 | 1630 - 3810 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.0335 | 2780 | 403 | adw |



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|------------------|---------|-------|----------------|----------------|-------------------|------------------------|--------------------|---------------|---------|------------|--------------------------|--------------|

SOIL Ready-to-Use VOAs in Soil (cat# 870, lot# D113-924) (Continued)

| | | | | | | | | | | | | |
|------|------------------------------|-------|-------|--------|--------------|------------|------------------|----------|--------|-------|------|-----|
| 5160 | 1,1,1-Trichloroethane | µg/kg | < 600 | < 600 | 0.00 - 600 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 5165 | 1,1,2-Trichloroethane | µg/kg | 1785 | 1820 | 1180 - 2460 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | -0.821 | 1930 | 172 | adw |
| 5170 | Trichloroethylene | µg/kg | 9418 | 8840 | 6480 - 11300 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.136 | 9250 | 1210 | adw |
| 5175 | Trichlorofluoromethane | µg/kg | < 200 | < 2000 | 0.00 - 2000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 5210 | 1,2,4-Trimethylbenzene | µg/kg | < 400 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 5215 | 1,3,5-Trimethylbenzene | µg/kg | < 200 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 5180 | 1,2,3-Trichloropropane (TCP) | µg/kg | 7626 | 7420 | 4080 - 10800 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.270 | 7390 | 875 | adw |
| 5225 | Vinyl acetate | µg/kg | < 200 | < 1000 | 0.00 - 1000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 5235 | Vinyl chloride | µg/kg | < 200 | < 2000 | 0.00 - 2000 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | | | | adw |
| 5240 | m&p-Xylene | µg/kg | 6499 | 5830 | 4080 - 7580 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.690 | 6090 | 599 | adw |
| 5250 | o-Xylene | µg/kg | 6049 | 5320 | 3720 - 6920 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.938 | 5490 | 592 | adw |
| 5260 | Xylenes, total | µg/kg | 12550 | 11200 | 7840 - 14600 | Acceptable | EPA 8260B 2 1996 | 2/3/2021 | 0.707 | 11800 | 1120 | adw |

SOIL Gasoline Range Organics (GRO) in Soil (cat# 630, lot# D113-763)

| | | | | | | | | | | | | |
|------|-------------------------------|-------|-----|------|-------------|--------------|------------------|-----------|--------|------|------|-----|
| 9408 | Gasoline Range Organics (GRO) | mg/kg | 147 | 387 | 38.7 - 540 | Acceptable | EPA 8015C 3 2007 | 1/29/2021 | -0.545 | 200 | 98.0 | adw |
| 4375 | Benzene in GRO | mg/kg | | 1.71 | 0.00 - 2.05 | Not Reported | | | | 1.83 | 1.95 | |
| 4765 | Ethylbenzene in GRO | mg/kg | | 6.51 | 2.16 - 8.63 | Not Reported | | | | 9.31 | 9.29 | |
| 5140 | Toluene in GRO | mg/kg | | 19.7 | 2.31 - 22.3 | Not Reported | | | | 22.1 | 22.2 | |
| 5260 | Xylenes, total in GRO | mg/kg | | 33.3 | 11.7 - 44.0 | Not Reported | | | | 50.1 | 50.1 | |

SOIL Diesel Range Organics (DRO) in Soil (cat# 631, lot# D113-765)

| | | | | | | | | | | | | |
|------|-----------------------------|-------|------|------|------------|------------|------------------|----------|--------|------|-----|-----|
| 9369 | Diesel Range Organics (DRO) | mg/kg | 1302 | 1990 | 535 - 2470 | Acceptable | EPA 8015C 3 2007 | 2/3/2021 | -0.515 | 1500 | 392 | dse |
|------|-----------------------------|-------|------|------|------------|------------|------------------|----------|--------|------|-----|-----|

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Study # : SOIL-113



CERTIFICATE OF RECOGNITION

ERA congratulates
Energy Laboratories
SOIL-113

For your participation and successful evaluation, we recognize the performance of this laboratory for achieving acceptable evaluation in the following standards.

Diesel Range Organics
(DRO) in Soil
Gasoline Range Organics
(GRO) in Soil
Nutrients in Soil
Ready-to-Use VOAs in Soil



Matthew Seebeck
Quality Officer