

January 4, 2016

Mr. Randall Ferguson
EHS Senior Compliance Specialist
PDC Energy, Inc.
1775 Sherman Street, Suite 3000
Denver, CO 80203

Re: **Produced Water Vessel Closure Report**
Carlson 2; 44-14 Tank Battery
Facility ID: 327346
SE S14 T5N R65W
Blanket Remediation #: 9440

Dear Mr. Ferguson,

On behalf of PDC Energy, Inc. (PDC), Tasman Geosciences, Inc. (Tasman) has prepared this Produced Water Vessel Closure Report (Report) to document environmental sampling activities performed at the above-referenced site. This Report is being submitted under the Form 27 Management Plan for Closure of Produced Water Vessels, which has been assigned Blanket Remediation #9440 by the Colorado Oil and Gas Conservation Commission (COGCC).

A summary of excavation and environmental sampling activities is provided below.

Site Assessment Activities

On June 25, 2015, confirmation sampling activities were completed following the removal of the partially buried produced water vessel. Soil encountered in the excavation area was field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). One soil sample (SS01) was collected below the former vessel location at approximately 7 feet below ground surface (bgs). The sample was submitted to Summit Scientific Laboratories in Golden, Colorado for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, and total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by Environmental Protection Agency (EPA) Method 8260B, TPH - diesel range organics (DRO) by EPA Method 8015, electrical conductivity (EC), sodium adsorption ratio (SAR), and pH.

Analytical results indicated organic compound concentrations and physical parameters were in compliance with COGCC Table 910-1 standards in soil sample SS01.

The excavation extent and soil sample location are illustrated on Figure 1. Soil analytical data is summarized in Table 1 and the laboratory analytical report is provided in Attachment A.

Conclusions

Based on the soil analytical data described herein, petroleum hydrocarbon impacts were not encountered during the removal of the produced water vessel. Consequently, no further site investigation is recommended at this time.

Please contact me at (720) 409-8791 if you have any questions regarding this report.

Sincerely,



Christine Wasko
Project Manager
Tasman Geosciences, Inc.

Enclosures:

Figure 1 – Soil Sample Location Map
Table 1 – Soil Analytical Results Summary Table
Attachment A – Laboratory Analytical Report






| | | | | |
|------------------|---|---|---|--|
| DRAWN BY: MAP | Facility Diagram PDC Energy – DJ Basin Carlson 2, 44-14 Tank Battery SE S14 T5N R65W Weld County, CO |  TASMAN GEOSCIENCES 6899 Pecos St., Unit C Denver, CO 80221 | LEGEND  Excavation Extent  Soil Sample Location <p>All locations are approximate unless otherwise noted</p> | FIGURE 1 SOIL SAMPLE LOCATION MAP |
| DATE: 12/22/2015 | | | | |

TABLE 1
CARLSON 2, 44-14 TANK BATTERY
SOIL ANALYTICAL RESULTS SUMMARY TABLE

| Sample ID | Date Sampled | Depth (feet bgs) | Benzene (mg/kg) | Toluene (mg/kg) | Ethylbenzene (mg/kg) | Total Xylenes (mg/kg) | Naphthalene (mg/kg) | TPH ⁽²⁾ (mg/kg) | SAR (units) | EC (mmhos/cm) | pH (units) |
|---|--------------|---------------------|--------------------|--------------------|-------------------------|-----------------------------|------------------------|-------------------------------|----------------|------------------|---------------|
| COGCC standards for soil (mg/kg) ⁽¹⁾ | | | 0.17 | 85 | 100 | 175 | 23 | 500 | <12 | <4 or 2x BG | 6-9 |
| SS01 @ 7' | 6/25/2015 | 7 | <0.0020 | <0.0050 | <0.0050 | <0.010 | <0.010 | <50 | 0.562 | 0.252 | 8.91 |

Notes:

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective February 1, 2014.

2. TPH - Total volatile and extractable petroleum hydrocarbons. Value calculated by adding GRO and DRO concentrations.

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit.

GRO = Total volatile petroleum hydrocarbons - gasoline range organics

DRO = Total extractable petroleum hydrocarbons - diesel range organics

mg/kg = Milligrams per kilogram

bgs = Below ground surface

SAR = Sodium adsorption ratio

EC = Electrical Conductivity

mmhos/cm = Millimhos per centimeter

BOLD = Analytical result is in exceedance of COGCC soil standards.

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

July 06, 2015

Christine Wasko
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Carlson 2

Enclosed are the results of analyses for samples received by Summit Scientific on 06/26/15 17:10. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Shrewsbury', with a stylized, cursive script.

Paul Shrewsbury
President



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Carlson 2
Project Number: [none]
Project Manager: Christine Wasko

Reported:
07/06/15 09:30

ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|-----------|---------------|--------|----------------|----------------|
| SS01@7' | 1506271-01 | Soil | 06/25/15 12:10 | 06/26/15 17:10 |

Summit Scientific

741 Corporate Circle, Suite J&K ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933

Page 1 of 1

Client: PDC/Tasman Project Manager: Christine Wasko
Address: 6899 Pecos St Unit C E-Mail: CWasko@tasman-gas.com
City/State/Zip: Denver CO 80221
Phone: 303 487 1228 Fax: Project Name: Carlson 2
Sampler Name: Adam T. Fisk Project Number:

| ID | Sample Description | Date Sampled | Time Sampled | # of containers | Preservative | | | | Matrix | | | Analysis Requested | | | | Special Instructions |
|------------------|--------------------|---------------|--------------|--------------------|--------------|----------------|------|---------------------------------|-------------|-------------|----------------|--------------------|----------------|-----------|--------------|----------------------|
| | | | | | HCl | HNO3 | None | Other (Specify) | Groundwater | Soil | Air-Canister # | Other (Specify) | Asparten (B&B) | Deo (B&B) | pH, EC, etc. | |
| 1 | SS01@7' | 6/25/15 | 12:10 | 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | |
| Relinquished by: | | Date/Time: | | Received by: | | Date/Time: | | Turn Around Time (Check) | | Notes: | | | | | | |
| [Signature] | | 6/26/15 10:30 | | Thomas G. Ferguson | | 6/26/15 5:10pm | | Same Day _____ 72 hours _____ | | [Signature] | | | | | | |
| Relinquished by: | | Date/Time: | | Received by: | | Date/Time: | | 24 hours _____ Standard _____ | | | | | | | | |
| Relinquished by: | | Date/Time: | | Received by: | | Date/Time: | | 48 hours _____ | | | | | | | | |
| | | | | | | | | Sample Integrity: | | | | | | | | |
| | | | | | | | | Temperature Upon Receipt: 5.8°C | | | | | | | | |
| | | | | | | | | Intact: (Yes) No | | | | | | | | |

www.s2scientific.com

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Carlson 2
Project Number: [none]
Project Manager: Christine Wasko

Reported:
07/06/15 09:30

SS01@7'
1506271-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 06/25/15 12:10

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---------------|--------|-----------------|-------|----------|---------|----------|----------|--------|-------|
| C10-C28 (DRO) | ND | 50 | mg/kg | 1 | 1506354 | 06/29/15 | 06/29/15 | 8015M | |

Date Sampled: 06/25/15 12:10

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: o-Terphenyl | | 103 % | 30-150 | | " | " | " | " | |

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 06/25/15 12:10

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------|--------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Naphthalene | ND | 0.010 | mg/kg | 1 | 1506355 | 06/29/15 | 06/29/15 | EPA 8260B | |
| Benzene | ND | 0.0020 | " | " | " | " | " | " | |
| Toluene | ND | 0.0050 | " | " | " | " | " | " | |
| Ethylbenzene | ND | 0.0050 | " | " | " | " | " | " | |
| Xylenes (total) | ND | 0.010 | " | " | " | " | " | " | |
| Gasoline Range Hydrocarbons | ND | 0.50 | " | " | " | " | " | " | |

Date Sampled: 06/25/15 12:10

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 | | 104 % | 23-173 | | " | " | " | " | |
| Surrogate: Toluene-d8 | | 96.7 % | 20-170 | | " | " | " | " | |
| Surrogate: 4-Bromofluorobenzene | | 98.1 % | 21-167 | | " | " | " | " | |

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 06/25/15 12:10

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---------|--------|-----------------|-------|----------|-------|----------|----------|--------|-------|
|---------|--------|-----------------|-------|----------|-------|----------|----------|--------|-------|

Summit Scientific

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PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Carlson 2
Project Number: [none]
Project Manager: Christine Wasko

Reported:
07/06/15 09:30

SS01@7'
1506271-01 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

| Analyte | Result | Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------|--------|-------|-----------|----------|---------|----------|----------|-------------------------------|-------|
| Calcium | 103 | 4.74 | mg/kg dry | 1 | 1506353 | 06/29/15 | 06/29/15 | EPA 6020/Mod. USDA60 6(2, 3A) | |
| Magnesium | 12.5 | 2.37 | " | " | " | " | " | " | |
| Sodium | 22.7 | 2.37 | " | " | " | " | " | " | |

Date Sampled: 06/25/15 12:10

| Analyte | Result | Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-------------------------|--------|-------|-------|----------|---------|----------|----------|--------|-------|
| Sodium Adsorption Ratio | 0.562 | | units | " | 1507006 | 07/01/15 | 07/01/15 | " | |

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 06/25/15 12:10

| Analyte | Result | Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---------------------------|--------|--------|----------|----------|---------|----------|----------|----------|-------|
| Specific Conductance (EC) | 0.252 | 0.0100 | mmhos/cm | 1 | 1506356 | 06/29/15 | 06/29/15 | SM 2510B | |

Date Sampled: 06/25/15 12:10

| Analyte | Result | Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---------|--------|-------|----------|----------|---------|----------|----------|----------|-------|
| pH | 8.91 | 0.100 | pH Units | " | 1506357 | 06/29/15 | 06/29/15 | EPA 9045 | |

Date Sampled: 06/25/15 12:10

| Analyte | Result | Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------|--------|-------|-------|----------|---------|----------|----------|---------------|-------|
| % Solids | 95.7 | | % | " | 1506366 | 06/30/15 | 06/30/15 | % calculation | |

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PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Carlson 2
Project Number: [none]
Project Manager: Christine Wasko

Reported:
07/06/15 09:30

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

| Analyte | Reporting | | | Spike | Source | | %REC | | RPD | |
|---------|-----------|-------|-------|-------|--------|------|--------|-----|-------|-------|
| | Result | Limit | Units | Level | Result | %REC | Limits | RPD | Limit | Notes |

Batch 1506354 - EPA 3550A

Blank (1506354-BLK1)

Prepared & Analyzed: 06/29/15

| | | | | | | | | | | |
|------------------------|------|----|-------|------|--|------|--------|--|--|--|
| C10-C28 (DRO) | ND | 50 | mg/kg | | | | | | | |
| Surrogate: o-Terphenyl | 11.5 | | " | 12.2 | | 94.6 | 30-150 | | | |

LCS (1506354-BS1)

Prepared & Analyzed: 06/29/15

| | | | | | | | | | | |
|------------------------|------|----|-------|------|--|------|--------|--|--|--|
| C10-C28 (DRO) | 578 | 50 | mg/kg | 501 | | 115 | 73-134 | | | |
| Surrogate: o-Terphenyl | 12.1 | | " | 12.2 | | 99.5 | 30-150 | | | |

Matrix Spike (1506354-MS1)

Source: 1506268-01

Prepared & Analyzed: 06/29/15

| | | | | | | | | | | |
|------------------------|------|----|-------|------|------|------|--------|--|--|--|
| C10-C28 (DRO) | 502 | 50 | mg/kg | 485 | 22.9 | 98.9 | 50-148 | | | |
| Surrogate: o-Terphenyl | 11.4 | | " | 11.8 | | 96.8 | 30-150 | | | |

Matrix Spike Dup (1506354-MSD1)

Source: 1506268-01

Prepared & Analyzed: 06/29/15

| | | | | | | | | | | |
|------------------------|------|----|-------|------|------|------|--------|------|----|--|
| C10-C28 (DRO) | 519 | 50 | mg/kg | 493 | 22.9 | 101 | 50-148 | 3.29 | 13 | |
| Surrogate: o-Terphenyl | 11.7 | | " | 12.0 | | 97.1 | 30-150 | | | |

Summit Scientific

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PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Carlson 2
Project Number: [none]
Project Manager: Christine Wasko

Reported:
07/06/15 09:30

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

| Analyte | Reporting | | | Spike | Source | | %REC | | RPD | |
|---------|-----------|-------|-------|-------|--------|------|--------|-----|-------|-------|
| | Result | Limit | Units | Level | Result | %REC | Limits | RPD | Limit | Notes |

Batch 1506355 - EPA 5030 Soil MS

Blank (1506355-BLK1)

Prepared & Analyzed: 06/29/15

| | | | | | | | | | | |
|----------------------------------|--------|--------|-------|--------|------|--------|--|--|--|--|
| Naphthalene | ND | 0.010 | mg/kg | | | | | | | |
| Benzene | ND | 0.0020 | " | | | | | | | |
| Toluene | ND | 0.0050 | " | | | | | | | |
| Ethylbenzene | ND | 0.0050 | " | | | | | | | |
| Xylenes (total) | ND | 0.010 | " | | | | | | | |
| Gasoline Range Hydrocarbons | ND | 0.50 | " | | | | | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 0.0433 | | " | 0.0396 | 109 | 23-173 | | | | |
| Surrogate: Toluene-d8 | 0.0394 | | " | 0.0400 | 98.4 | 20-170 | | | | |
| Surrogate: 4-Bromofluorobenzene | 0.0387 | | " | 0.0400 | 96.8 | 21-167 | | | | |

LCS (1506355-BS1)

Prepared & Analyzed: 06/29/15

| | | | | | | | | | | |
|----------------------------------|--------|--------|-------|--------|------|--------|--|--|--|--|
| Naphthalene | ND | 0.010 | mg/kg | | | 66-138 | | | | |
| Benzene | 0.109 | 0.0020 | " | 0.100 | 109 | 58-130 | | | | |
| Toluene | 0.109 | 0.0050 | " | 0.100 | 109 | 61-134 | | | | |
| Ethylbenzene | 0.108 | 0.0050 | " | 0.0992 | 108 | 74-139 | | | | |
| m,p-Xylene | 0.213 | 0.010 | " | 0.200 | 107 | 73-137 | | | | |
| o-Xylene | 0.113 | 0.0050 | " | 0.0984 | 115 | 73-141 | | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 0.0445 | | " | 0.0396 | 112 | 23-173 | | | | |
| Surrogate: Toluene-d8 | 0.0401 | | " | 0.0400 | 100 | 20-170 | | | | |
| Surrogate: 4-Bromofluorobenzene | 0.0383 | | " | 0.0400 | 95.7 | 21-167 | | | | |

Matrix Spike (1506355-MS1)

Source: 1506268-01

Prepared & Analyzed: 06/29/15

| | | | | | | | | | | |
|----------------------------------|--------|--------|-------|--------|------|--------|--|--|--|--|
| Naphthalene | ND | 0.010 | mg/kg | | ND | 10-158 | | | | |
| Benzene | 0.103 | 0.0020 | " | 0.0958 | ND | 30-131 | | | | |
| Toluene | 0.0993 | 0.0050 | " | 0.0958 | ND | 30-134 | | | | |
| Ethylbenzene | 0.0987 | 0.0050 | " | 0.0950 | ND | 22-153 | | | | |
| m,p-Xylene | 0.196 | 0.010 | " | 0.191 | ND | 10-159 | | | | |
| o-Xylene | 0.106 | 0.0050 | " | 0.0943 | ND | 31-151 | | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 0.0431 | | " | 0.0379 | 114 | 23-173 | | | | |
| Surrogate: Toluene-d8 | 0.0385 | | " | 0.0383 | 100 | 20-170 | | | | |
| Surrogate: 4-Bromofluorobenzene | 0.0376 | | " | 0.0383 | 98.2 | 21-167 | | | | |

Summit Scientific

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PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Carlson 2
Project Number: [none]
Project Manager: Christine Wasko

Reported:
07/06/15 09:30

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

| Analyte | Reporting | | | Spike | Source | | %REC | | RPD | |
|---------|-----------|-------|-------|-------|--------|------|--------|-----|-------|-------|
| | Result | Limit | Units | Level | Result | %REC | Limits | RPD | Limit | Notes |

Batch 1506355 - EPA 5030 Soil MS

| Matrix Spike Dup (1506355-MSD1) | | Source: 1506268-01 | | | Prepared & Analyzed: 06/29/15 | | | | | |
|----------------------------------|--------|--------------------|-------|--------|-------------------------------|------|--------|------|----|--|
| Naphthalene | ND | 0.010 | mg/kg | | ND | | 10-158 | | 42 | |
| Benzene | 0.100 | 0.0020 | " | 0.0994 | ND | 101 | 30-131 | 3.34 | 34 | |
| Toluene | 0.0931 | 0.0050 | " | 0.0994 | ND | 93.6 | 30-134 | 6.49 | 30 | |
| Ethylbenzene | 0.0937 | 0.0050 | " | 0.0986 | ND | 95.0 | 22-153 | 5.18 | 24 | |
| m,p-Xylene | 0.185 | 0.010 | " | 0.198 | ND | 93.3 | 10-159 | 5.96 | 68 | |
| o-Xylene | 0.102 | 0.0050 | " | 0.0978 | ND | 104 | 31-151 | 4.24 | 38 | |
| Surrogate: 1,2-Dichloroethane-d4 | 0.0458 | | " | 0.0394 | | 116 | 23-173 | | | |
| Surrogate: Toluene-d8 | 0.0405 | | " | 0.0398 | | 102 | 20-170 | | | |
| Surrogate: 4-Bromofluorobenzene | 0.0404 | | " | 0.0398 | | 102 | 21-167 | | | |

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Carlson 2
Project Number: [none]
Project Manager: Christine Wasko

Reported:
07/06/15 09:30

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

| Analyte | Reporting | | | Spike | Source | | %REC | | RPD | |
|---------|-----------|-------|-------|-------|--------|------|--------|-----|-------|-------|
| | Result | Limit | Units | Level | Result | %REC | Limits | RPD | Limit | Notes |

Batch 1506353 - General Preparation

Blank (1506353-BLK1)

Prepared & Analyzed: 06/29/15

| | | | |
|-----------|------|------|-----------|
| Calcium | ND | 10.0 | mg/kg wet |
| Magnesium | ND | 5.00 | " |
| Sodium | 12.5 | 5.00 | " |

LCS (1506353-BS1)

Prepared & Analyzed: 06/29/15

| | | | | | | |
|-----------|-----|------|-----------|-----|-----|----------|
| Calcium | 580 | 10.0 | mg/kg wet | 500 | 116 | 82.9-118 |
| Magnesium | 540 | 5.00 | " | 500 | 108 | 77.1-123 |
| Sodium | 576 | 5.00 | " | 500 | 115 | 71-129 |

Duplicate (1506353-DUP1)

Source: 1506270-01

Prepared & Analyzed: 06/29/15

| | | | | | | |
|-----------|-----|------|-----------|------|------|-----|
| Calcium | 624 | 5.39 | mg/kg dry | 548 | 12.9 | 200 |
| Magnesium | 116 | 2.69 | " | 88.5 | 27.2 | 200 |
| Sodium | 745 | 2.69 | " | 652 | 13.3 | 200 |

Matrix Spike (1506353-MS1)

Source: 1506270-01

Prepared & Analyzed: 06/29/15

| | | | | | | | | |
|-----------|------|------|-----------|-----|------|-----|--------|-------|
| Calcium | 1020 | 5.69 | mg/kg dry | 284 | 548 | 167 | 75-125 | QM-07 |
| Magnesium | 413 | 2.84 | " | 284 | 88.5 | 114 | 75-125 | |
| Sodium | 1080 | 2.84 | " | 284 | 652 | 152 | 75-125 | QM-07 |

Matrix Spike Dup (1506353-MSD1)

Source: 1506270-01

Prepared & Analyzed: 06/29/15

| | | | | | | | | | | |
|-----------|------|------|-----------|-----|------|-----|--------|------|----|-------|
| Calcium | 2320 | 9.95 | mg/kg dry | 498 | 548 | 355 | 75-125 | 77.6 | 25 | QM-07 |
| Magnesium | 741 | 4.98 | " | 498 | 88.5 | 131 | 75-125 | 57.0 | 25 | QM-07 |
| Sodium | 1840 | 4.98 | " | 498 | 652 | 238 | 75-125 | 51.5 | 25 | QM-07 |

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Carlson 2
Project Number: [none]
Project Manager: Christine Wasko

Reported:
07/06/15 09:30

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
Summit Scientific

| Analyte | Reporting | | | Spike | Source | %REC | | RPD | | |
|---------|-----------|-------|-------|-------|--------|------|--------|-----|-------|-------|
| | Result | Limit | Units | Level | Result | %REC | Limits | RPD | Limit | Notes |

Batch 1506356 - General Preparation

Blank (1506356-BLK1)

Prepared & Analyzed: 06/29/15

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (1506356-BS1)

Prepared & Analyzed: 06/29/15

Specific Conductance (EC) 476 0.0100 mmhos/cm 500 95.2 90-110

Duplicate (1506356-DUP1)

Source: 1506270-01

Prepared & Analyzed: 06/29/15

Specific Conductance (EC) 1.68 0.0100 mmhos/cm 1.70 1.30 20

Batch 1506357 - General Preparation

LCS (1506357-BS1)

Prepared & Analyzed: 06/29/15

pH 8.01 0.100 pH Units 8.00 100 95-105

Duplicate (1506357-DUP1)

Source: 1506270-01

Prepared & Analyzed: 06/29/15

pH 8.72 0.100 pH Units 8.74 0.229 20

Batch 1506366 - General Preparation

Duplicate (1506366-DUP1)

Source: 1506270-01

Prepared & Analyzed: 06/30/15

% Solids 82.0 % 82.1 0.122 20

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Carlson 2
Project Number: [none]
Project Manager: Christine Wasko

Reported:
07/06/15 09:30

Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

A handwritten signature in black ink, appearing to be 'MSW'.