

May 17, 2016

Mr. Jacob Evans
Senior Environmental Specialist
Noble Energy, Inc.
2115 117th Ave
Greeley, CO 80631

**RE: Monitoring Report
Sandau #1 Spreadfield COGCC #431953
Weld County, CO**

Dear Mr. Evans:

Olsson Associates (Olsson), under the direction of Noble Energy, Inc. (Noble) conducted soil sampling on April 25, 2016 at the Sandau #1 Spreadfield (Site) to monitor the conditions of the soil post incorporation activities.

Location Description

The Site is located in Weld County at the northeast corner of the intersection of County Road 35 and County Road 40. The legal site description is Section 25, Township 4 North, Range 66 West, 6th Principal Meridian. Cutting application began on February 22, 2013 and is permitted to continue until February 22, 2016.

Sampling Procedures

On April 25, 2016, Olsson collected eight individual soil samples and one 20 point composite sample as depicted on the attached Soil Sample Location Map. The soil samples were collected using a clean hand auger and placed into laboratory prepared glassware. Equipment was cleaned with Alconox and deionized water between samples. Each sample represents surface to eight inches below ground surface (bgs). Samples were delivered by hand on the same day to Summit laboratory in Golden, Colorado following chain of custody procedures.

Analytical Results

A copy of the laboratory analytical report is included as Attachment 1 and is summarized in attached Table 1. TPH (total petroleum hydrocarbons) and BTEX (benzene, toluene, ethylbenzene, and xylenes (total)) were non-detect (ND) in all soil samples. Arsenic concentrations ranged between 3.22 mg/kg for SS 7 and 5.59 mg/kg for SS 2. The average

arsenic concentration for the April 25, 2016 soil samples was 4.41 mg/kg and the median arsenic concentration was 4.46 mg/kg.

Trace amounts of Polycyclic Aromatic Hydrocarbons (PAH's) were detected in the composite sample; Benzo (a) anthracene 0.00703 mg/kg, Chrysene 0.0199 mg/kg, Naphthalene 0.00828 mg/kg, Phenanthrene 0.0169 mg/kg, Pyrene 0.00861 mg/kg. All other PAH's were ND.

Summary and Conclusions

Olsson collected eight soil samples which were submitted for laboratory analysis at Summit. With the exception of arsenic, all results were within Table 910-1 standards. Soils in Weld County are characteristically high in arsenic. In soil samples collected for baseline data in June, 2012 arsenic ranged from 1.46 mg/kg to 1.81 mg/kg with an average of 1.61 mg/kg. Arsenic in soil samples collected on April 25, 2016 ranged from 3.22 mg/kg to 5.59 mg/kg with an average of 4.41 mg/kg.

Olsson recommends Noble request closure status for the Sandau 1 Spreadfield.

Please call me if you have any questions.

Sincerely,
Olsson Associates, Inc.

Nikki Grady

Nikki Graber
Associate Scientist

John K.

Paige Koutelas
Assistant Scientist

Attachments: Table 1 - Soil Analytical Results
Attachment 1 - Summit Laboratory Analytical Reports
Attachment 2 - Soil Sample Location Map

COGCC ID #	Spreadfield Name	Date Sampled
431953	Sandau 1 Spreadfield	April 25, 2016

Laboratory Analytical Summary- Composite PAH'S

Analysis	6/15/2012 Composite (mg/kg)	4/25/2016 Composite (mg/kg)
Acenaphthene	ND	ND
Acenaphthylene	ND	ND
Anthracene	ND	ND
Benzo (a) anthracene	ND	0.00703
Benzo (b) fluoranthene	ND	ND
Benzo (k) fluoranthene	ND	ND
Benzo (g,h,i) perylene	ND	ND
Benzo (a) pyrene	ND	ND
Chrysene	ND	0.0199
Dibenz (a,h) anthracene	ND	ND
Fluoranthene	ND	ND
Fluorene	ND	ND
Indeno (1,2,3-cd) pyrene	ND	ND
Naphthalene	ND	0.00828
Phenanthrene	ND	0.0169
Pyrene	ND	0.00861

mg/kg - Milligrams per kilogram

ND-Non Detect

PAH- Polycyclic Aromatic Hydrocarbons

COGCC ID #	Spreadfield Name	Date Sampled
431953	Sandau 1 Spreadfield	April 25, 2016

Laboratory Analytical Summary- Arsenic

Sample Number	Arsenic 6/15/2012 (mg/kg) Background	Arsenic 7/8/2015 (mg/kg)	Arsenic 4/25/2016 (mg/kg)	Difference
Sandau 1	1.72	2.4	5.20	3.5
Sandau 2	1.49	5.1	5.59	4.1
Sandau 3	1.46	4.2	4.42	3.0
Sandau 4	1.50	2.7	4.79	3.3
Sandau 5	1.73	4.7	3.34	1.6
Sandau 6	1.61	2.3	4.50	2.9
Sandau 7	1.54	2.6	3.22	1.7
Sandau 8	1.81	3.9	4.23	2.4

Average	1.61	3.5	4.41	2.80
Median	1.58	3.3	4.46	2.93

Minimum Concentration	1.46	2.3	3.22
Maximum Concentration	1.81	5.1	5.59

mg/kg - Milligrams per kilogram

COGCC ID #	Spreadfield Name	Date Sampled
431953	Sandau 1 Spreadfield	April 25, 2016

Laboratory Analytical Summary

Sample Number	TPH 6/15/2012 (mg/kg) Background	TPH 7/8/2015 (mg/kg)	TPH 4/25/2016 (mg/kg)	Difference
Sandau 1	ND	39	ND	NA
Sandau 2	ND	150	ND	NA
Sandau 3	ND	150	ND	NA
Sandau 4	ND	110	ND	NA
Sandau 5	ND	150	ND	NA
Sandau 6	ND	36	ND	NA
Sandau 7	ND	85	ND	NA
Sandau 8	ND	92	ND	NA

Average	NA	102	NA	NA
Median	NA	101	NA	NA

Minimum Concentration	NA	36	NA
Maximum Concentration	NA	150	NA

mg/kg - Milligrams per kilogram

TPH-Total Petroleum Hydrocarbons (GRO+DRP)

ND-Non detect

NA-Not applicable

COGCC ID #	Spreadfield Name	Date Sampled
431953	Sandau 1 Spreadfield	April 25, 2016

Laboratory Analytical Summary- Napthalene

Sample Number	Naphthalene 6/15/2012 (mg/kg) Background	Naphthalene 7/8/2015 (mg/kg)	Naphthalene 4/25/2016 (mg/kg)	Difference
Sandau 1	Not Sampled	0.023	Not Sampled	NA
Sandau 2	Not Sampled	0.093	Not Sampled	NA
Sandau 3	Not Sampled	0.060	Not Sampled	NA
Sandau 4	Not Sampled	0.055	Not Sampled	NA
Sandau 5	Not Sampled	0.140	Not Sampled	NA
Sandau 6	Not Sampled	0.012	Not Sampled	NA
Sandau 7	Not Sampled	0.036	Not Sampled	NA
Sandau 8	Not Sampled	0.065	Not Sampled	NA

Average	NA	0.061	NA	NA
Median	NA	0.058	NA	NA

Minimum Concentration	0	0.012	0
Maximum Concentration	0	0.140	0

mg/kg - Milligrams per kilogram

TPH-Total Petroleum Hydrocarbons (GRO+DRP)

NA-Not applicable

COGCC ID #	Spreadfield Name	Date Sampled
431953	Sandau 1 Spreadfield	April 25, 2016

Laboratory Analytical Summary- BTEX

Sample Number	BTEX 6/15/2012 (ug/kg) Background		BTEX 7/8/2015 (ug/kg)		BTEX 4/25/2016 (ug/kg)		Difference
Sandau 1	Benzene	ND	Benzene	ND	Benzene	ND	NA
	Toluene	ND	Toluene	ND	Toluene	ND	NA
	Ethylbenzene	ND	Ethylbenzene	ND	Ethylbenzene	ND	NA
	Xylenes (total)	ND	Xylenes (total)	ND	Xylenes (total)	ND	NA
Sandau 2	Benzene	ND	Benzene	ND	Benzene	ND	NA
	Toluene	ND	Toluene	ND	Toluene	ND	NA
	Ethylbenzene	ND	Ethylbenzene	ND	Ethylbenzene	ND	NA
	Xylenes (total)	ND	Xylenes (total)	ND	Xylenes (total)	ND	NA
Sandau 3	Benzene	ND	Benzene	ND	Benzene	ND	NA
	Toluene	ND	Toluene	ND	Toluene	ND	NA
	Ethylbenzene	ND	Ethylbenzene	ND	Ethylbenzene	ND	NA
	Xylenes (total)	ND	Xylenes (total)	ND	Xylenes (total)	ND	NA
Sandau 4	Benzene	ND	Benzene	ND	Benzene	ND	NA
	Toluene	ND	Toluene	ND	Toluene	ND	NA
	Ethylbenzene	ND	Ethylbenzene	ND	Ethylbenzene	ND	NA
	Xylenes (total)	ND	Xylenes (total)	ND	Xylenes (total)	ND	NA
Sandau 5	Benzene	ND	Benzene	ND	Benzene	ND	NA
	Toluene	ND	Toluene	ND	Toluene	ND	NA
	Ethylbenzene	ND	Ethylbenzene	ND	Ethylbenzene	ND	NA
	Xylenes (total)	ND	Xylenes (total)	ND	Xylenes (total)	ND	NA
Sandau 6	Benzene	ND	Benzene	ND	Benzene	ND	NA
	Toluene	ND	Toluene	ND	Toluene	ND	NA
	Ethylbenzene	ND	Ethylbenzene	ND	Ethylbenzene	ND	NA
	Xylenes (total)	ND	Xylenes (total)	ND	Xylenes (total)	ND	NA
Sandau 7	Benzene	ND	Benzene	ND	Benzene	ND	NA
	Toluene	ND	Toluene	ND	Toluene	ND	NA
	Ethylbenzene	ND	Ethylbenzene	ND	Ethylbenzene	ND	NA
	Xylenes (total)	ND	Xylenes (total)	ND	Xylenes (total)	ND	NA
Sandau 8	Benzene	ND	Benzene	ND	Benzene	ND	NA
	Toluene	ND	Toluene	ND	Toluene	ND	NA
	Ethylbenzene	ND	Ethylbenzene	ND	Ethylbenzene	ND	NA
	Xylenes (total)	ND	Xylenes (total)	ND	Xylenes (total)	ND	NA

ug/kg- micrograms per kilogram
ND-Non Detect

COGCC ID #	Spreadfield Name	Date Sampled
431953	Sandau 1 Spreadfield	April 25, 2016

Laboratory Analytical Summary- EC, SAR, pH

Closure Sample Number	Specific Conductance (EC) (mmhos/cm)	Sodium Adsorption Ratio (SAR)	pH
Sandau 1-1	0.453	0.607	8.37
Sandau 1-2	0.347	0.48	8.22
Sandau 1-3	0.446	0.591	8.24
Sandau 1-4	0.402	0.487	8.26
Sandau 1-5	0.502	0.614	8.17
Sandau 1-6	0.479	0.626	8.31
Sandau 1-7	0.926	1.51	8.28
Sandau 1-8	0.746	1.34	8.18

Closure Average	0.538	0.782	8.25
Closure Median	0.466	0.611	8.25

Closure Minimum Concentration	0.347	0.4810	8.17
Closure Maximum Concentration	0.93	1.51	8.37

Baseline Sample Number	Specific Conductance (EC) (mmhos/cm)	Sodium Adsorption Ratio	pH
Sandau SS01	0.452	1.08	7.1
Sandau SS02	0.359	2.39	7.2
Sandau SS03	0.422	1.66	7.4
Sandau SS04	0.450	0.950	6.5
Sandau SS05	0.359	1.42	6.8
Sandau SS06	0.458	2.33	6.7
Sandau SS07	0.233	1.65	7.0
Sandau SS08	0.169	1.47	7.2

Baseline Average	0.363	1.619	6.99
Baseline Median	0.391	1.370	7.15

Baseline Minimum Concentration	0.359	0.9500	6.50
Baseline Maximum Concentration	0.452	2.3900	7.40

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 02, 2016

Nikki Graber

Olsson Associates

4690 Table Mountain Drive, Suite 200

Golden, CO 80403

RE: Sandau #1

Enclosed are the results of analyses for samples received by Summit Scientific on 04/25/16 15:02. 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



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Sandau 1-1	1604204-01	Soil	04/25/16 09:55	04/25/16 15:02
Sandau 1-2	1604204-02	Soil	04/25/16 10:06	04/25/16 15:02
Sandau 1-3	1604204-03	Soil	04/25/16 10:17	04/25/16 15:02
Sandau 1-4	1604204-04	Soil	04/25/16 10:26	04/25/16 15:02
Sandau 1-5	1604204-05	Soil	04/25/16 10:59	04/25/16 15:02
Sandau 1-6	1604204-06	Soil	04/25/16 11:12	04/25/16 15:02
Sandau 1-7	1604204-07	Soil	04/25/16 11:23	04/25/16 15:02
Sandau 1-8	1604204-08	Soil	04/25/16 11:42	04/25/16 15:02
Sandau 1 Composite	1604204-09	Soil	04/25/16 11:42	04/25/16 15:02

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

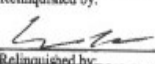


Summit Scientific

1604204

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 • 303-374-5933 Fax

Page 1 of 1

Client:	Olsson	Project Manager:	Nikki Graber
Address:	300 E 16th St	E-Mail:	ngrab@olssonassociates.com
City/State/Zip:	Greeley, CO 80631	Project Name:	Sandau #1
Phone:	928-240-1043 Fax:	Project Number:	015-01421
Sampler Name:	Nikki Graber		

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative			Matrix			Analyze For:							Special Instructions	
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Cautler Serial #	Other (Specify)	BTEX260b	GRODRO 8015M	EC USDA HB80	SAR EPA 6020	PH(paste)		ARSENIC 6020
Sandau 1-1	4/25/2016	0855	2		x						x	x	x	x	x			
Sandau 1-2	4/25/2016	1006	2		x						x	x	x	x	x			
Sandau 1-3	4/25/2016	1019	2		x						x	x	x	x	x			
Sandau 1-4	4/25/2016	1026	2		x						x	x	x	x	x			
Sandau 1-5	4/25/2016	1059	2		x						x	x	x	x	x			
Sandau 1-6	4/25/2016	1112	2		x						x	x	x	x	x			
Sandau 1-7	4/25/2016	1125	2		x						x	x	x	x	x			
Sandau 1-8	4/25/2016	1129	2		x						x	x	x	x	x			
Sandau 1 Composite	4/25/2016	1142	2		x											x		
Relinquished by: 				Date/Time: 4/25/16 1502	Received by: 				Date/Time: 4-25-16 1502	Turn Around Time (Check)				Notes:				
										Same Day <input type="checkbox"/>				72 Hours <input type="checkbox"/>				
										24 Hours <input type="checkbox"/>				Standard <input checked="" type="checkbox"/>				
										48 Hours <input type="checkbox"/>								
Relinquished by: 				Date/Time: 4-25-16 17:40	Received in Lab by:				Date/Time:	Sample Integrity:								
										Temperature Upon Receipt: 133								
										Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>								

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sample Receipt Checklist

S2 Work Order: 1604204

Client: Olsson

Client Project ID: Sandau #1 015-01421

Shipped Via: HD

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

Matrix (check all that apply): ☐ Air ☒ Soil/Solid ☐ Water ☐ Other: _____ (Describe)

Cooler ID					
Temp (°C)	<u>13.3</u>				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.				
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?			<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, etc.				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				
⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.				

Muri Premier

NA 42546

1505



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-1
1604204-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/25/16 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604273	04/26/16	04/27/16	8015M	

Date Sampled: **04/25/16 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		114 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/25/16 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1604274	04/26/16	04/27/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/25/16 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.0 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **04/25/16 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	5.20	0.114	mg/kg dry	1	1604283	04/27/16	04/27/16	EPA 6020A	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-1
1604204-01 (Soil)

Summit Scientific

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

Date Sampled: **04/25/16 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1720	11.4	mg/kg dry	1	1604285	04/27/16	04/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	137	5.71	"	"	"	"	"	"	
Sodium	97.2	5.71	"	"	"	"	"	"	

Date Sampled: **04/25/16 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.607		units	"	1605001	05/02/16	05/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/25/16 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.453	0.0100	mmhos/cm	1	1604271	04/26/16	04/26/16	SM 2510B	

Date Sampled: **04/25/16 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.37	0.100	pH Units	"	1604270	04/26/16	04/26/16	EPA 9045	

Date Sampled: **04/25/16 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	87.6		%	"	1604272	04/26/16	04/27/16	% calculation	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-2
1604204-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/25/16 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604273	04/26/16	04/27/16	8015M	

Date Sampled: **04/25/16 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		115 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/25/16 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1604274	04/26/16	04/27/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/25/16 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		113 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.7 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **04/25/16 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	5.59	0.100	mg/kg dry	1	1604283	04/27/16	04/27/16	EPA 6020A	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-2
1604204-02 (Soil)

Summit Scientific

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

Date Sampled: **04/25/16 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1120	9.95	mg/kg dry	1	1604285	04/27/16	04/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	83.4	4.98	"	"	"	"	"	"	
Sodium	61.9	4.98	"	"	"	"	"	"	

Date Sampled: **04/25/16 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.481		units	"	1605001	05/02/16	05/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/25/16 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.347	0.0100	mmhos/cm	1	1604271	04/26/16	04/26/16	SM 2510B	

Date Sampled: **04/25/16 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.22	0.100	pH Units	"	1604270	04/26/16	04/26/16	EPA 9045	

Date Sampled: **04/25/16 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	85.9		%	"	1604272	04/26/16	04/27/16	% calculation	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-3
1604204-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/25/16 10:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604273	04/26/16	04/27/16	8015M	

Date Sampled: **04/25/16 10:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		109 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/25/16 10:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1604274	04/26/16	04/27/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/25/16 10:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		118 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.9 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **04/25/16 10:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	4.42	0.101	mg/kg dry	1	1604283	04/27/16	04/27/16	EPA 6020A	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-3
1604204-03 (Soil)

Summit Scientific

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

Date Sampled: **04/25/16 10:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1420	11.6	mg/kg dry	1	1604285	04/27/16	04/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	105	5.81	"	"	"	"	"	"	
Sodium	85.6	5.81	"	"	"	"	"	"	

Date Sampled: **04/25/16 10:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.591		units	"	1605001	05/02/16	05/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/25/16 10:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.446	0.0100	mmhos/cm	1	1604271	04/26/16	04/26/16	SM 2510B	

Date Sampled: **04/25/16 10:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.24	0.100	pH Units	"	1604270	04/26/16	04/26/16	EPA 9045	

Date Sampled: **04/25/16 10:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	86.1		%	"	1604272	04/26/16	04/27/16	% calculation	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-4
1604204-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/25/16 10:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604273	04/26/16	04/27/16	8015M	

Date Sampled: **04/25/16 10:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		107 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/25/16 10:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1604274	04/26/16	04/27/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/25/16 10:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		116 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.5 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **04/25/16 10:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	4.79	0.114	mg/kg dry	1	1604283	04/27/16	04/27/16	EPA 6020A	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-4
1604204-04 (Soil)

Summit Scientific

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

Date Sampled: **04/25/16 10:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1690	8.74	mg/kg dry	1	1604285	04/27/16	04/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	141	4.37	"	"	"	"	"	"	
Sodium	77.6	4.37	"	"	"	"	"	"	

Date Sampled: **04/25/16 10:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.487		units	"	1605001	05/02/16	05/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/25/16 10:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.402	0.0100	mmhos/cm	1	1604271	04/26/16	04/26/16	SM 2510B	

Date Sampled: **04/25/16 10:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.26	0.100	pH Units	"	1604270	04/26/16	04/26/16	EPA 9045	

Date Sampled: **04/25/16 10:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	87.4		%	"	1604272	04/26/16	04/27/16	% calculation	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-5
1604204-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/25/16 10:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604273	04/26/16	04/27/16	8015M	

Date Sampled: **04/25/16 10:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		109 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/25/16 10:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1604274	04/26/16	04/27/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/25/16 10:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.9 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **04/25/16 10:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	3.34	0.116	mg/kg dry	1	1604283	04/27/16	04/27/16	EPA 6020A	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-5
1604204-05 (Soil)

Summit Scientific

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

Date Sampled: **04/25/16 10:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1190	9.47	mg/kg dry	1	1604285	04/27/16	04/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	89.7	4.73	"	"	"	"	"	"	
Sodium	81.6	4.73	"	"	"	"	"	"	

Date Sampled: **04/25/16 10:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.614		units	"	1605001	05/02/16	05/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/25/16 10:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.502	0.0100	mmhos/cm	1	1604271	04/26/16	04/26/16	SM 2510B	

Date Sampled: **04/25/16 10:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.17	0.100	pH Units	"	1604270	04/26/16	04/26/16	EPA 9045	

Date Sampled: **04/25/16 10:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	86.2		%	"	1604272	04/26/16	04/27/16	% calculation	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-6
1604204-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/25/16 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604273	04/26/16	04/27/16	8015M	

Date Sampled: **04/25/16 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		106 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/25/16 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1604274	04/26/16	04/27/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/25/16 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.1 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **04/25/16 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	4.50	0.105	mg/kg dry	1	1604283	04/27/16	04/27/16	EPA 6020A	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-6
1604204-06 (Soil)

Summit Scientific

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

Date Sampled: **04/25/16 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1660	9.69	mg/kg dry	1	1604285	04/27/16	04/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	261	4.85	"	"	"	"	"	"	
Sodium	104	4.85	"	"	"	"	"	"	

Date Sampled: **04/25/16 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.626		units	"	1605001	05/02/16	05/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/25/16 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.479	0.0100	mmhos/cm	1	1604271	04/26/16	04/26/16	SM 2510B	

Date Sampled: **04/25/16 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.31	0.100	pH Units	"	1604270	04/26/16	04/26/16	EPA 9045	

Date Sampled: **04/25/16 11:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	86.1		%	"	1604272	04/26/16	04/27/16	% calculation	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-7
1604204-07 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/25/16 11:23**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604273	04/26/16	04/27/16	8015M	

Date Sampled: **04/25/16 11:23**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/25/16 11:23**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1604274	04/26/16	04/27/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/25/16 11:23**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		117 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **04/25/16 11:23**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	3.22	0.118	mg/kg dry	1	1604283	04/27/16	04/27/16	EPA 6020A	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-7
1604204-07 (Soil)

Summit Scientific

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

Date Sampled: **04/25/16 11:23**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1410	9.07	mg/kg dry	1	1604285	04/27/16	04/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	189	4.53	"	"	"	"	"	"	
Sodium	227	4.53	"	"	"	"	"	"	

Date Sampled: **04/25/16 11:23**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.51		units	"	1605001	05/02/16	05/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/25/16 11:23**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.926	0.0100	mmhos/cm	1	1604271	04/26/16	04/26/16	SM 2510B	

Date Sampled: **04/25/16 11:23**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.28	0.100	pH Units	"	1604270	04/26/16	04/26/16	EPA 9045	

Date Sampled: **04/25/16 11:23**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	84.8		%	"	1604272	04/26/16	04/27/16	% calculation	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-8
1604204-08 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604273	04/26/16	04/27/16	8015M	

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		105 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1604274	04/26/16	04/27/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	4.23	0.114	mg/kg dry	1	1604283	04/27/16	04/27/16	EPA 6020A	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1-8
1604204-08 (Soil)

Summit Scientific

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

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1370	10.3	mg/kg dry	1	1604285	04/27/16	04/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	137	5.13	"	"	"	"	"	"	
Sodium	194	5.13	"	"	"	"	"	"	

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.34		units	"	1605001	05/02/16	05/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.746	0.0100	mmhos/cm	1	1604271	04/26/16	04/26/16	SM 2510B	

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.18	0.100	pH Units	"	1604270	04/26/16	04/26/16	EPA 9045	

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	87.9		%	"	1604272	04/26/16	04/27/16	% calculation	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Sandau 1 Composite
1604204-09 (Soil)

Summit Scientific

Semivolatile Organic Compounds by EPA Method 8270D SIM

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	1604287	04/28/16	04/29/16	EPA 8270D SIM	
Acenaphthylene	ND	0.00500	"	"	"	"	"	"	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	0.00703	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Chrysene	0.0199	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Naphthalene	0.00828	0.00500	"	"	"	"	"	"	
Phenanthrene	0.0169	0.00500	"	"	"	"	"	"	
Pyrene	0.00861	0.00500	"	"	"	"	"	"	

Date Sampled: **04/25/16 11:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		50.6 %	35-150		"	"	"	"	
Surrogate: Fluoranthene-d10		51.9 %	35-150		"	"	"	"	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

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 1604273 - EPA 3550A

Blank (1604273-BLK1)

Prepared & Analyzed: 04/26/16

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-Terphenyl 12.6 " 12.5 101 30-150

LCS (1604273-BS1)

Prepared: 04/26/16 Analyzed: 04/27/16

C10-C28 (DRO) 598 50 mg/kg 499 120 73-134

Surrogate: o-Terphenyl 14.3 " 12.5 114 30-150

Matrix Spike (1604273-MS1)

Source: 1604204-01

Prepared: 04/26/16 Analyzed: 04/27/16

C10-C28 (DRO) 521 50 mg/kg 459 37.6 105 50-148

Surrogate: o-Terphenyl 13.7 " 11.5 119 30-150

Matrix Spike Dup (1604273-MSD1)

Source: 1604204-01

Prepared: 04/26/16 Analyzed: 04/27/16

C10-C28 (DRO) 531 50 mg/kg 477 37.6 103 50-148 1.79 13

Surrogate: o-Terphenyl 13.6 " 12.0 114 30-150

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

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 1604274 - EPA 5030 Soil MS

Blank (1604274-BLK1)

Prepared: 04/26/16 Analyzed: 04/27/16

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0428		"	0.0400		107	23-173			
Surrogate: Toluene-d8	0.0403		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0400		96.8	21-167			

LCS (1604274-BS1)

Prepared: 04/26/16 Analyzed: 04/27/16

Benzene	0.0882	0.0020	mg/kg	0.100		88.2	58-130			
Toluene	0.0900	0.0050	"	0.100		90.0	61-134			
Ethylbenzene	0.120	0.0050	"	0.0992		121	74-139			
m,p-Xylene	0.230	0.010	"	0.200		115	73-137			
o-Xylene	0.108	0.0050	"	0.0980		110	73-141			
Xylenes (total)	0.338	0.0050	"				30-150			
Gasoline Range Hydrocarbons	2.68	0.50	"				30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0422		"	0.0400		106	23-173			
Surrogate: Toluene-d8	0.0403		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400		98.1	21-167			

Matrix Spike (1604274-MS1)

Source: 1604204-01

Prepared: 04/26/16 Analyzed: 04/27/16

Benzene	0.0878	0.0020	mg/kg	0.0996	ND	88.2	30-131			
Toluene	0.0884	0.0050	"	0.0996	ND	88.7	30-134			
Ethylbenzene	0.121	0.0050	"	0.0988	ND	122	22-153			
m,p-Xylene	0.231	0.010	"	0.199	ND	116	10-159			
o-Xylene	0.111	0.0050	"	0.0976	ND	113	31-151			
Xylenes (total)	0.341	0.0050	"		ND		30-150			
Gasoline Range Hydrocarbons	2.75	0.50	"		ND		30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0440		"	0.0398		111	23-173			
Surrogate: Toluene-d8	0.0396		"	0.0398		99.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0390		"	0.0398		98.0	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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

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 1604274 - EPA 5030 Soil MS

Matrix Spike Dup (1604274-MSD1)		Source: 1604204-01			Prepared: 04/26/16		Analyzed: 04/27/16			
Benzene	0.0901	0.0020	mg/kg	0.0982	ND	91.8	30-131	2.58	34	
Toluene	0.0891	0.0050	"	0.0982	ND	90.7	30-134	0.790	30	
Ethylbenzene	0.117	0.0050	"	0.0974	ND	120	22-153	3.18	24	
m,p-Xylene	0.224	0.010	"	0.196	ND	114	10-159	2.87	68	
o-Xylene	0.109	0.0050	"	0.0963	ND	113	31-151	1.49	38	
Xylenes (total)	0.333	0.0050	"		ND		30-150	2.42	20	
Gasoline Range Hydrocarbons	2.80	0.50	"		ND		30-150	1.66	20	
Surrogate: 1,2-Dichloroethane-d4	0.0457		"	0.0393		116	23-173			
Surrogate: Toluene-d8	0.0399		"	0.0393		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0378		"	0.0393		96.2	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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Semivolatile Organic Compounds by EPA Method 8270D SIM - Quality Control
Summit Scientific

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

Batch 1604287 - EPA 5030 Soil MS

Blank (1604287-BLK1)

Prepared: 04/28/16 Analyzed: 04/29/16

Acenaphthene	ND	0.00500	mg/kg
Acenaphthylene	ND	0.00500	"
Anthracene	ND	0.00500	"
Benzo (a) anthracene	ND	0.00500	"
Benzo (b) fluoranthene	ND	0.00500	"
Benzo (k) fluoranthene	ND	0.00500	"
Benzo (g,h,i) perylene	ND	0.00500	"
Benzo (a) pyrene	ND	0.00500	"
Chrysene	ND	0.00500	"
Dibenz (a,h) anthracene	ND	0.00500	"
Fluoranthene	ND	0.00500	"
Fluorene	ND	0.00500	"
Indeno (1,2,3-cd) pyrene	ND	0.00500	"
Naphthalene	ND	0.00500	"
Phenanthrene	ND	0.00500	"
Pyrene	ND	0.00500	"

Surrogate: 2-Methylnaphthalene-d10

0.0275

"

0.0329

83.7

35-150

Surrogate: Fluoranthene-d10

0.0315

"

0.0329

95.7

35-150

LCS (1604287-BS1)

Prepared: 04/28/16 Analyzed: 04/29/16

Acenaphthene	0.0266	0.00500	mg/kg	0.0329	80.8	50-150
Acenaphthylene	0.0259	0.00500	"	0.0329	78.9	50-150
Anthracene	0.0304	0.00500	"	0.0329	92.3	50-150
Benzo (a) anthracene	0.0340	0.00500	"	0.0329	103	50-150
Benzo (b) fluoranthene	0.0363	0.00500	"	0.0329	110	50-150
Benzo (k) fluoranthene	0.0385	0.00500	"	0.0329	117	50-150
Benzo (g,h,i) perylene	0.0322	0.00500	"	0.0329	97.9	50-150
Benzo (a) pyrene	0.0331	0.00500	"	0.0329	101	50-150
Chrysene	0.0348	0.00500	"	0.0329	106	50-150
Dibenz (a,h) anthracene	0.0343	0.00500	"	0.0329	104	50-150
Fluoranthene	0.0312	0.00500	"	0.0329	94.8	50-150
Fluorene	0.0259	0.00500	"	0.0329	78.8	50-150
Indeno (1,2,3-cd) pyrene	0.0317	0.00500	"	0.0329	96.4	50-150
2-Methylnaphthalene	0.0248	0.00500	"	0.0329	75.5	0-200
Naphthalene	0.0215	0.00500	"	0.0329	65.4	50-150
Phenanthrene	0.0276	0.00500	"	0.0329	84.0	50-150
Pyrene	0.0320	0.00500	"	0.0329	97.2	50-150

Surrogate: 2-Methylnaphthalene-d10

0.0248

"

0.0329

75.5

35-150

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Semivolatile Organic Compounds by EPA Method 8270D SIM - Quality Control
Summit Scientific

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

Batch 1604287 - EPA 5030 Soil MS

LCS (1604287-BS1)

Prepared: 04/28/16 Analyzed: 04/29/16

Surrogate: Fluoranthene-d10	0.0335		mg/kg	0.0329		102	35-150			
Matrix Spike (1604287-MS1)										
	Source: 1604205-09			Prepared: 04/28/16 Analyzed: 04/29/16						
Acenaphthene	0.0308	0.00500	mg/kg	0.0330	ND	93.3	50-150			
Acenaphthylene	0.0237	0.00500	"	0.0330	ND	71.9	50-150			
Anthracene	0.0286	0.00500	"	0.0330	ND	86.8	50-150			
Benzo (a) anthracene	0.0321	0.00500	"	0.0330	0.00367	86.1	50-150			
Benzo (b) fluoranthene	0.0428	0.00500	"	0.0330	0.0113	95.6	50-150			
Benzo (k) fluoranthene	0.0359	0.00500	"	0.0330	0.00278	100	50-150			
Benzo (g,h,i) perylene	0.0145	0.00500	"	0.0330	0.00302	34.6	50-150			QM-07
Benzo (a) pyrene	0.0267	0.00500	"	0.0330	ND	81.0	50-150			
Chrysene	0.0641	0.00500	"	0.0330	0.0282	109	50-150			
Dibenz (a,h) anthracene	0.0153	0.00500	"	0.0330	ND	46.3	50-150			QM-07
Fluoranthene	0.0306	0.00500	"	0.0330	0.00568	75.5	50-150			
Fluorene	0.0333	0.00500	"	0.0330	ND	101	50-150			
Indeno (1,2,3-cd) pyrene	0.0132	0.00500	"	0.0330	0.00174	34.6	50-150			QM-07
2-Methylnaphthalene	0.0699	0.00500	"	0.0330	0.0378	97.5	0-200			
Naphthalene	0.0462	0.00500	"	0.0330	0.0192	81.8	50-150			
Phenanthrene	0.0543	0.00500	"	0.0330	0.0281	79.4	50-150			
Pyrene	0.0450	0.00500	"	0.0330	0.0140	93.9	50-150			
Surrogate: 2-Methylnaphthalene-d10	0.00692		"	0.0330		21.0	35-150			S-03
Surrogate: Fluoranthene-d10	0.00770		"	0.0330		23.3	35-150			S-03

Matrix Spike Dup (1604287-MSD1)

Source: 1604205-09

Prepared: 04/28/16 Analyzed: 04/29/16

Acenaphthene	0.0252	0.00500	mg/kg	0.0331	ND	76.1	50-150	20.0	20	
Acenaphthylene	0.0213	0.00500	"	0.0331	ND	64.2	50-150	10.9	20	
Anthracene	0.0211	0.00500	"	0.0331	ND	63.6	50-150	30.5	20	QM-07
Benzo (a) anthracene	0.0282	0.00500	"	0.0331	0.00367	74.2	50-150	12.7	20	
Benzo (b) fluoranthene	0.0373	0.00500	"	0.0331	0.0113	78.5	50-150	13.9	20	
Benzo (k) fluoranthene	0.0321	0.00500	"	0.0331	0.00278	88.5	50-150	11.1	20	
Benzo (g,h,i) perylene	0.0118	0.00500	"	0.0331	0.00302	26.6	50-150	19.9	20	QM-07
Benzo (a) pyrene	0.0240	0.00500	"	0.0331	ND	72.5	50-150	10.7	20	
Chrysene	0.0524	0.00500	"	0.0331	0.0282	73.1	50-150	19.9	20	
Dibenz (a,h) anthracene	0.0133	0.00500	"	0.0331	ND	40.3	50-150	13.5	20	QM-07
Fluoranthene	0.0254	0.00500	"	0.0331	0.00568	59.6	50-150	18.5	20	
Fluorene	0.0269	0.00500	"	0.0331	ND	81.3	50-150	21.2	20	QM-07
Indeno (1,2,3-cd) pyrene	0.0123	0.00500	"	0.0331	0.00174	31.9	50-150	6.63	20	QM-07
2-Methylnaphthalene	0.0525	0.00500	"	0.0331	0.0378	44.4	0-200	28.6	200	

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Semivolatile Organic Compounds by EPA Method 8270D SIM - Quality Control
Summit Scientific

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

Batch 1604287 - EPA 5030 Soil MS

Matrix Spike Dup (1604287-MSD1)	Source: 1604205-09			Prepared: 04/28/16		Analyzed: 04/29/16				
Naphthalene	0.0339	0.00500	mg/kg	0.0331	0.0192	44.2	50-150	30.9	20	QM-07
Phenanthrene	0.0406	0.00500	"	0.0331	0.0281	37.6	50-150	28.9	20	QM-07
Pyrene	0.0307	0.00500	"	0.0331	0.0140	50.6	50-150	37.6	20	QM-07
Surrogate: 2-Methylnaphthalene-d10	0.00935		"	0.0331		28.2	35-150			S-03
Surrogate: Fluoranthene-d10	0.0100		"	0.0331		30.3	35-150			S-03

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Total Metals by EPA Method 6020 - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1604283 - EPA 3050B

Blank (1604283-BLK1)

Prepared & Analyzed: 04/27/16

Arsenic 1.66 0.100 mg/kg wet

LCS (1604283-BS1)

Prepared & Analyzed: 04/27/16

Arsenic 43.9 0.100 mg/kg wet 40.0 110 59.7-113

Duplicate (1604283-DUP1)

Source: 1604204-01

Prepared & Analyzed: 04/27/16

Arsenic 5.47 0.102 mg/kg dry 5.20 5.23 20

Matrix Spike (1604283-MS1)

Source: 1604204-01

Prepared & Analyzed: 04/27/16

Arsenic 48.3 0.103 mg/kg dry 41.3 5.20 105 75-125

Matrix Spike Dup (1604283-MSD1)

Source: 1604204-01

Prepared & Analyzed: 04/27/16

Arsenic 46.5 0.102 mg/kg dry 40.8 5.20 101 75-125 3.77 25

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

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 1604285 - General Preparation

Blank (1604285-BLK1)

Prepared: 04/27/16 Analyzed: 04/28/16

Calcium	ND	10.0	mg/kg wet
Magnesium	ND	5.00	"
Sodium	ND	5.00	"

LCS (1604285-BS1)

Prepared: 04/27/16 Analyzed: 04/28/16

Calcium	530	10.0	mg/kg wet	500	106	82.9-118
Magnesium	498	5.00	"	500	99.6	77.1-123
Sodium	545	5.00	"	500	109	71-129

Duplicate (1604285-DUP1)

Source: 1604204-01

Prepared: 04/27/16 Analyzed: 04/28/16

Calcium	1590	11.4	mg/kg dry	1720	7.41	200
Magnesium	146	5.71	"	137	6.20	200
Sodium	95.6	5.71	"	97.2	1.66	200

Matrix Spike (1604285-MS1)

Source: 1604204-01

Prepared: 04/27/16 Analyzed: 04/28/16

Calcium	2180	11.4	mg/kg dry	538	1720	87.4	75-125
Magnesium	688	5.71	"	538	137	103	75-125
Sodium	668	5.71	"	538	97.2	106	75-125

Matrix Spike Dup (1604285-MSD1)

Source: 1604204-01

Prepared: 04/27/16 Analyzed: 04/28/16

Calcium	2170	11.4	mg/kg dry	538	1720	85.4	75-125	0.492	25
Magnesium	679	5.71	"	538	137	101	75-125	1.37	25
Sodium	730	5.71	"	538	97.2	118	75-125	8.86	25

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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

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 1604270 - General Preparation

LCS (1604270-BS1)

Prepared & Analyzed: 04/26/16

pH	8.03	0.100	pH Units	8.00	100	95-105
----	------	-------	----------	------	-----	--------

Duplicate (1604270-DUP1)

Source: 1604204-01

Prepared & Analyzed: 04/26/16

pH	8.33	0.100	pH Units	8.37	0.479	20
----	------	-------	----------	------	-------	----

Batch 1604271 - General Preparation

Blank (1604271-BLK1)

Prepared & Analyzed: 04/26/16

Specific Conductance (EC)	ND	0.0100	mmhos/cm
---------------------------	----	--------	----------

LCS (1604271-BS1)

Prepared & Analyzed: 04/26/16

Specific Conductance (EC)	0.500	0.0100	mmhos/cm	0.500	99.9	90-110
---------------------------	-------	--------	----------	-------	------	--------

Duplicate (1604271-DUP1)

Source: 1604204-01

Prepared & Analyzed: 04/26/16

Specific Conductance (EC)	0.552	0.0100	mmhos/cm	0.453	19.6	20
---------------------------	-------	--------	----------	-------	------	----

Batch 1604272 - General Preparation

Duplicate (1604272-DUP1)

Source: 1604204-01

Prepared: 04/26/16 Analyzed: 04/27/16

% Solids	88.0	%	87.6	0.522	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.



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: Sandau #1
Project Number: 015-01421
Project Manager: Nikki Graber

Reported:
05/02/16 08:49

Notes and Definitions

S-03 The surrogate recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.

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.

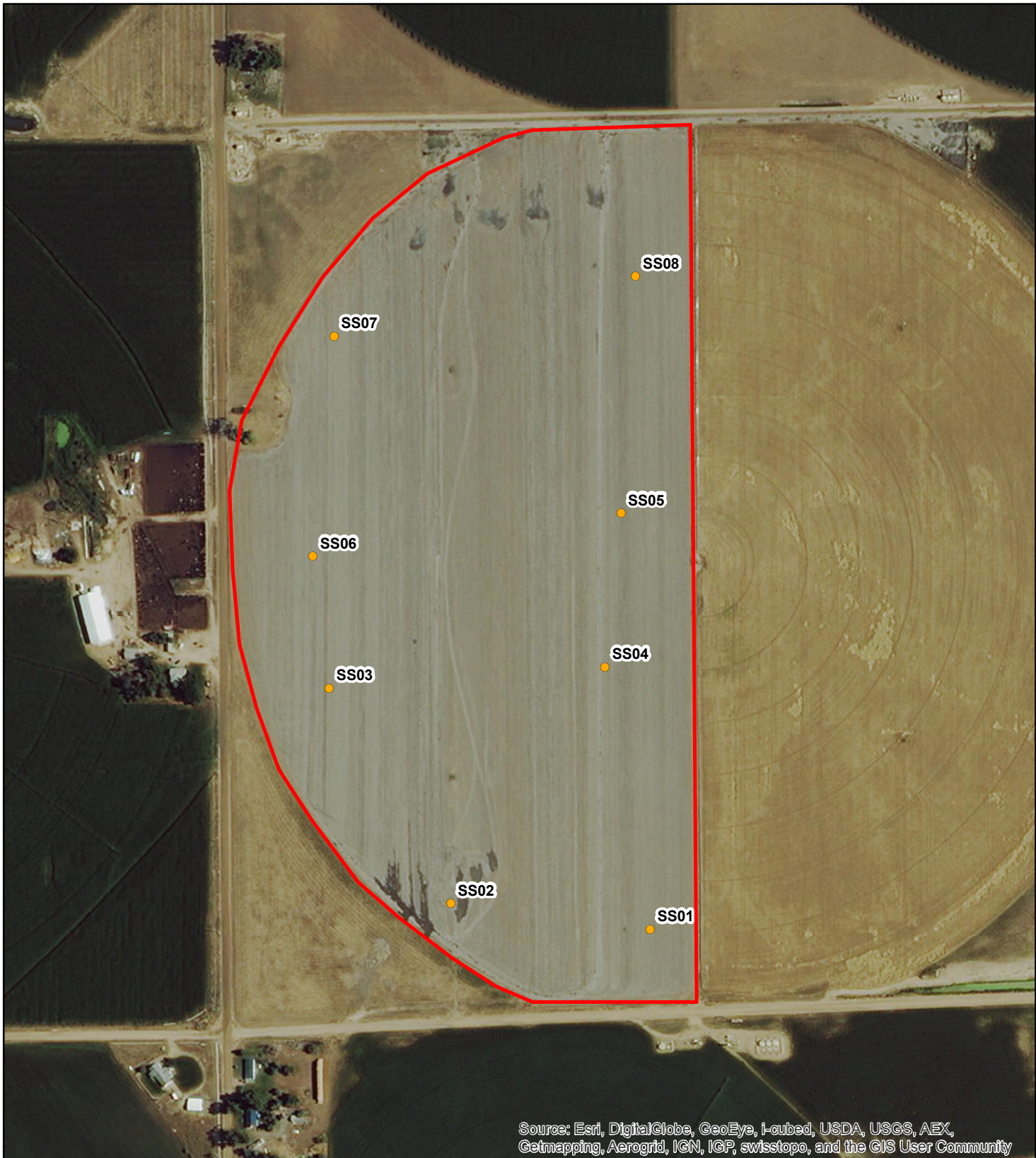
DET Analyte DETECTED

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



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

- Site Boundary
- Soil Boring/Monitoring Well

N

0 200 400

Feet

DISCLAIMER : This Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended, nor does it replace legal description information in the chain of title and other information contained in official government records such as the County Clerk and Records office or the courts. In addition, the representations of locations in this GIS cannot be substituted for actual legal surveys.

F:\Projects\015-142140-Design\GISMap.mxd

Project Number: 014-0957	Site Map Sandau #1 Spread Field Noble Energy, Inc. Weld County, Colorado	 <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div>4690 Table Mountain Drive Suite 200 Golden, Colorado 80403 P: 303.237.2072 F: 303.237.2659</div> <div>Figure 1</div> </div>
Drawn By: JDF		
Revision Date: 5/17/2016		