

ANALYTICAL SUMMARY REPORT

March 06, 2015

EOG Resources Inc
600 17th St Ste 1000 N
Denver, CO 80202

Work Order: C15020740

Project Name: GC 12-19H PW Spill

Energy Laboratories, Inc. Casper WY received the following 3 samples for EOG Resources Inc on 2/25/2015 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C15020740-001	1-4 GC 12-19H	02/18/15 0:00	02/25/15	Solid	Cation Exchange Capacity Metals, NH4OAc Extractable Metals, Saturated Paste Conductivity Exchangeable Sodium Percentage Ultrasonic Extraction Methanol Extraction for Volatiles Diesel Range Organics Gasoline Range Organics Soluble Metals from Paste pH, Saturated Paste CEC NH4AC Soil Extraction NH4AC Soil Extraction Saturated Paste Sodium Adsorption Ratio Saturation Percentage
C15020740-002	1-A GC 12-19H	02/18/15 0:00	02/25/15	Solid	Same As Above
C15020740-003	4-A GC 12-19H	02/18/15 11:55	02/25/15	Solid	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Radiochemistry analyses were performed at Energy Laboratories, Inc., 2325 Kerzell Lane, Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

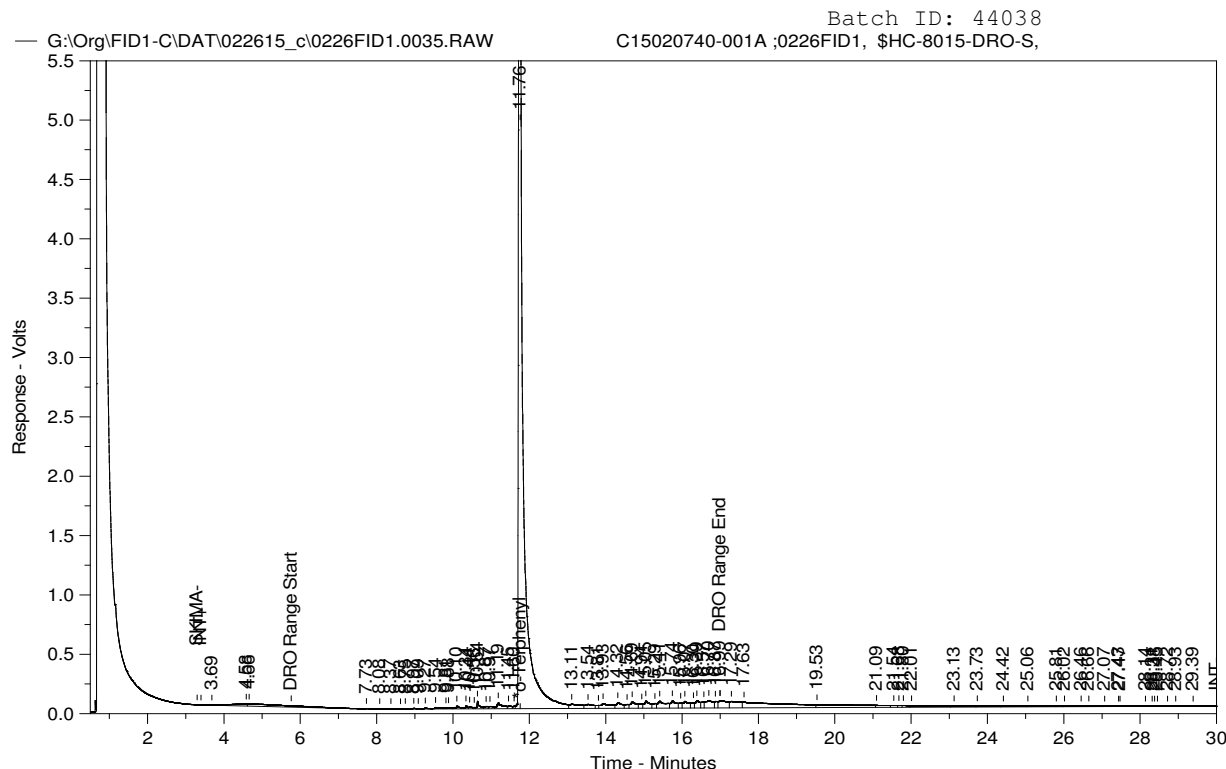
Client: EOG Resources Inc
Project: GC 12-19H PW Spill
Lab ID: C15020740-001
Client Sample ID: 1-4 GC 12-19H

Report Date: 03/06/15
Collection Date: 02/18/15
Date Received: 02/25/15
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SATURATED PASTE							
Saturation	28.6	%		0.1		USDA27a	03/03/15 10:07 / dm
SATURATED PASTE EXTRACT							
Conductivity, sat. paste	15.8	mmhos/cm		0.01		ASAM10-3	03/03/15 11:11 / dm
pH, sat. paste	7.8	s.u.		0.1		ASAM10-3.2	03/03/15 10:09 / dm
Calcium, sat. paste	3.22	meq/L		0.05		SW6010B	03/03/15 17:57 / sf
Magnesium, sat. paste	0.73	meq/L		0.08		SW6010B	03/03/15 17:57 / sf
Sodium, sat. paste	143	meq/L	D	0.1		SW6010B	03/03/15 17:57 / sf
Sodium Adsorption Ratio (SAR)	102	unitless		0.1		USDA20B	03/06/15 08:24 / smm
CHEMICAL CHARACTERISTICS							
Cation Exchange Capacity	8.15	meq/100g		0.01		SW6010B	03/03/15 14:51 / sf
Sodium, soluble	943	mg/kg-dry	D	1.0		Calculation	03/06/15 13:02 / kbh
Sodium, extractable	9.17	meq/100g		0.04		SW6010B	03/03/15 15:10 / sf
Exchangeable Sodium Percentage	62.2	%		0.1		USDA20a	03/06/15 09:57 / rdw
ORGANIC CHARACTERISTICS							
Diesel Range Organics (DRO)	ND	mg/kg		10		SW8015B	02/27/15 12:07 / dm
Surr: o-Terphenyl	71.0	%REC		56-147		SW8015B	02/27/15 12:07 / dm
Gasoline Range Organics (GRO)	ND	mg/kg		4.0		SW8015B	02/28/15 01:21 / jlr
Surr: Trifluorotoluene	98.0	%REC		53.8-137		SW8015B	02/28/15 01:21 / jlr

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



DIESEL RANGE ORGANICS CHROMATOGRAM

Sample Name: C15020740-001A ;0226FID1, \$HC-8015-DRO-S,
Raw File: G:\Org\FID1-C\DAT\022615_c\0226FID1.0035.RAW
Date & Time Acquired: 2/27/2015 12:07:10
Method File: G:\org\FID1-C\Methods\FID1_BASE_CAL_022315_R1.met
Calibration File: \\cafle\organics\DRO\org\FID1-C\Cals\FID1_022315.CAL
Sample Weight: 30.1 Dilution: 1 S.A.: 1

Mean RF for Hydrocarbon Range Calculations: 55080
Rt range for Diesel Range Organics (C10 to C28): 5.68 to 17.07
Rt range for Oil Range Organics (C28 to C40+): 16.93 to End Time

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	11.76	33.223	47.259	142.25	-

DRO Area:1.192453E+07 DRO AMOUNT: 7.192519
TEH Area:2.398106E+07 TEH AMOUNT: 14.46465
Oil Area:1.118624E+07 OIL AMOUNT: 6.747204

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

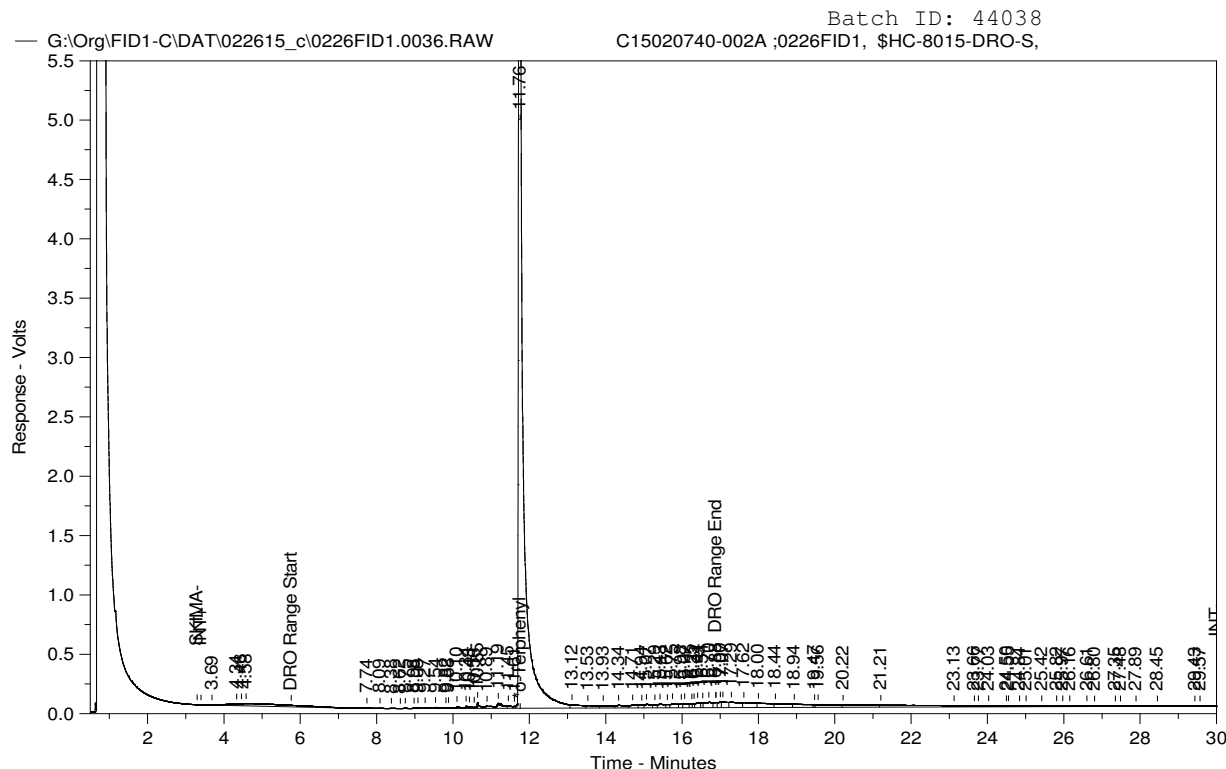
Client: EOG Resources Inc
Project: GC 12-19H PW Spill
Lab ID: C15020740-002
Client Sample ID: 1-A GC 12-19H

Report Date: 03/06/15
Collection Date: 02/18/15
Date Received: 02/25/15
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SATURATED PASTE							
Saturation	24.9	%		0.1		USDA27a	03/03/15 10:07 / dm
SATURATED PASTE EXTRACT							
Conductivity, sat. paste	11.8	mmhos/cm		0.01		ASAM10-3	03/03/15 11:12 / dm
pH, sat. paste	7.8	s.u.		0.1		ASAM10-3.2	03/03/15 10:09 / dm
Calcium, sat. paste	2.07	meq/L		0.05		SW6010B	03/03/15 18:02 / sf
Magnesium, sat. paste	0.43	meq/L		0.08		SW6010B	03/03/15 18:02 / sf
Sodium, sat. paste	107	meq/L	D	0.1		SW6010B	03/03/15 18:02 / sf
Sodium Adsorption Ratio (SAR)	95.5	unitless		0.1		USDA20B	03/06/15 08:24 / smm
CHEMICAL CHARACTERISTICS							
Cation Exchange Capacity	4.82	meq/100g		0.01		SW6010B	03/03/15 14:55 / sf
Sodium, soluble	613	mg/kg-dry	D	1.0		Calculation	03/06/15 13:02 / kbh
Sodium, extractable	6.45	meq/100g		0.04		SW6010B	03/03/15 15:14 / sf
Exchangeable Sodium Percentage	78.5	%		0.1		USDA20a	03/06/15 09:57 / rdw
ORGANIC CHARACTERISTICS							
Diesel Range Organics (DRO)	ND	mg/kg		10		SW8015B	02/27/15 12:53 / dm
Surr: o-Terphenyl	71.0	%REC		56-147		SW8015B	02/27/15 12:53 / dm
Gasoline Range Organics (GRO)	ND	mg/kg		4.0		SW8015B	02/28/15 01:58 / jlr
Surr: Trifluorotoluene	108	%REC		53.8-137		SW8015B	02/28/15 01:58 / jlr

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



DIESEL RANGE ORGANICS CHROMATOGRAM

Sample Name: C15020740-002A ;0226FID1, \$HC-8015-DRO-S,
Raw File: G:\Org\FID1-C\DAT\022615_c\0226FID1.0036.RAW
Date & Time Acquired: 2/27/2015 12:53:08
Method File: G:\org\FID1-C\Methods\FID1_BASE_CAL_022315_R1.met
Calibration File: \\cafle\organics\DRO\org\FID1-C\Cals\FID1_022315_.CAL
Sample Weight: 30.1 Dilution: 1 S.A.: 1

Mean RF for Hydrocarbon Range Calculations: 55080
Rt range for Diesel Range Organics (C10 to C28): 5.68 to 17.07
Rt range for Oil Range Organics (C28 to C40+): 16.93 to End Time

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
*o-Terphenyl	11.76	33.223	47.335	142.48

DRO Area:7887942 DRO AMOUNT: 4.757768
TEH Area:2.024459E+07 TEH AMOUNT: 12.21093
Oil Area:1.050718E+07 OIL AMOUNT: 6.337614

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

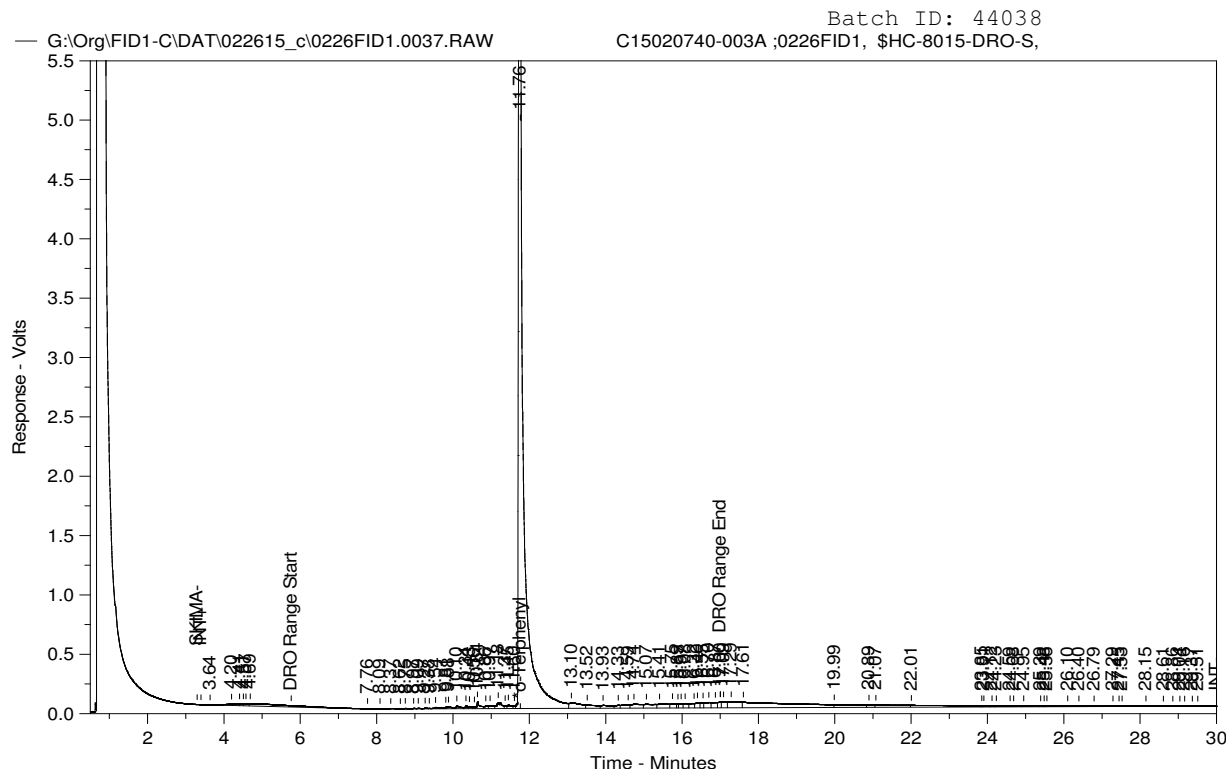
Client: EOG Resources Inc
Project: GC 12-19H PW Spill
Lab ID: C15020740-003
Client Sample ID: 4-A GC 12-19H

Report Date: 03/06/15
Collection Date: 02/18/15 11:55
Date Received: 02/25/15
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SATURATED PASTE							
Saturation	23.1	%		0.1		USDA27a	03/03/15 10:07 / dm
SATURATED PASTE EXTRACT							
Conductivity, sat. paste	16.4	mmhos/cm		0.01		ASAM10-3	03/03/15 11:13 / dm
pH, sat. paste	7.6	s.u.		0.1		ASAM10-3.2	03/03/15 10:09 / dm
Calcium, sat. paste	3.93	meq/L		0.05		SW6010B	03/03/15 18:06 / sf
Magnesium, sat. paste	0.96	meq/L		0.08		SW6010B	03/03/15 18:06 / sf
Sodium, sat. paste	145	meq/L	D	0.1		SW6010B	03/03/15 18:06 / sf
Sodium Adsorption Ratio (SAR)	92.6	unitless		0.1		USDA20B	03/06/15 08:24 / smm
CHEMICAL CHARACTERISTICS							
Cation Exchange Capacity	6.59	meq/100g		0.01		SW6010B	03/03/15 14:58 / sf
Sodium, soluble	767	mg/kg-dry	D	1.0		Calculation	03/06/15 13:02 / kbh
Sodium, extractable	7.92	meq/100g		0.04		SW6010B	03/03/15 15:18 / sf
Exchangeable Sodium Percentage	69.4	%		0.1		USDA20a	03/06/15 09:57 / rdw
ORGANIC CHARACTERISTICS							
Diesel Range Organics (DRO)	ND	mg/kg		10		SW8015B	02/27/15 13:39 / dm
Surr: o-Terphenyl	74.0	%REC		56-147		SW8015B	02/27/15 13:39 / dm
Gasoline Range Organics (GRO)	ND	mg/kg		4.0		SW8015B	02/28/15 02:34 / jlr
Surr: Trifluorotoluene	105	%REC		53.8-137		SW8015B	02/28/15 02:34 / jlr

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



DIESEL RANGE ORGANICS CHROMATOGRAM

Sample Name: C15020740-003A ;0226FID1, \$HC-8015-DRO-S,
Raw File: G:\Org\FID1-C\DAT\022615_c\0226FID1.0037.RAW
Date & Time Acquired: 2/27/2015 13:39:01
Method File: G:\org\FID1-C\Methods\FID1_BASE_CAL_022315_R1.met
Calibration File: \\cafle\organics\DRO\org\FID1-C\Cals\FID1_022315_.CAL
Sample Weight: 30 Dilution: 1 S.A.: 1

Mean RF for Hydrocarbon Range Calculations: 55080
Rt range for Diesel Range Organics (C10 to C28): 5.68 to 17.07
Rt range for Oil Range Organics (C28 to C40+): 16.93 to End Time

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
*o-Terphenyl	11.762	33.333	49.58	148.74

DRO Area:9963170 DRO AMOUNT: 6.029515
TEH Area:2.346176E+07 TEH AMOUNT: 14.19859
Oil Area:1.186804E+07 OIL AMOUNT: 7.182302



QA/QC Summary Report

Prepared by Casper, WY Branch

Client: EOG Resources Inc

Report Date: 03/06/15

Project: GC 12-19H PW Spill

Work Order: C15020740

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASAM10-3								Analytical Run: COND1-C_150303A		
Lab ID: CCV1_150303A		Continuing Calibration Verification Standard								03/03/15 11:07
Conductivity, sat. paste		5.04	mmhos/cm	0.010	101	90	110			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: EOG Resources Inc
Project: GC 12-19H PW Spill

Report Date: 03/06/15
Work Order: C15020740

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B										Analytical Run: ICP4-C_150303A
Lab ID: ICV	3	Initial Calibration Verification Standard								03/03/15 12:24
Calcium		49.5	mg/L	0.50	99	90	110			
Magnesium		49.5	mg/L	0.50	99	90	110			
Sodium		49.5	mg/L	0.50	99	90	110			
Lab ID: ICSA	3	Interference Check Sample A								03/03/15 12:44
Calcium		456	mg/L	0.50	91	80	120			
Magnesium		496	mg/L	0.50	99	80	120			
Sodium		-0.0121	mg/L	0.50						
Lab ID: ICSAB	3	Interference Check Sample AB								03/03/15 12:48
Calcium		457	mg/L	0.50	91	80	120			
Magnesium		498	mg/L	0.50	100	80	120			
Sodium		0.0914	mg/L	0.50						
Method: SW6010B										Batch: 44055
Lab ID: MB-44055		Method Blank								Run: ICP4-C_150303A 03/03/15 13:59
Sodium		ND	mg/L	1						
Lab ID: LCS-44055		Laboratory Control Sample								Run: ICP4-C_150303A 03/03/15 14:03
Sodium		4780	mg/L	2.4	93	75	138			
Lab ID: C15020199-005CDIL		Serial Dilution								Run: ICP4-C_150303A 03/03/15 14:27
Sodium		1640	mg/L	0.56		0	0	1.6	20	
Lab ID: C15020199-005CDUP		Sample Duplicate								Run: ICP4-C_150303A 03/03/15 14:31
Sodium		1620	mg/L	2.4				0.5	20	
Method: SW6010B										Batch: 44056
Lab ID: MB-44056		Method Blank								Run: ICP4-C_150303A 03/03/15 15:02
Sodium		3	mg/kg-dry	0.06						
Lab ID: C15020740-003ADIL		Serial Dilution								Run: ICP4-C_150303A 03/03/15 15:22
Sodium		1740	mg/kg-dry	1.0		0	0			
Lab ID: C15020740-003ADUP		Sample Duplicate								Run: ICP4-C_150303A 03/03/15 16:10
Sodium		1800	mg/kg-dry	1.0				1.3	20	
Method: SW6010B										Batch: 44061
Lab ID: MB-44061	3	Method Blank								Run: ICP4-C_150303A 03/03/15 17:38
Calcium		ND	mg/L	0.2						
Magnesium		ND	mg/L	0.02						
Sodium		ND	mg/L	0.5						
Lab ID: LCS-44061	3	Laboratory Control Sample								Run: ICP4-C_150303A 03/03/15 17:53
Calcium		482	mg/L	1.0	96	70	130			
Magnesium		216	mg/L	1.0	94	70	130			
Sodium		808	mg/L	2.4	90	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: EOG Resources Inc

Report Date: 03/06/15

Project: GC 12-19H PW Spill

Work Order: C15020740

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B										Batch: 44061
Lab ID: C15020740-003ADIL	3	Serial Dilution				Run: ICP4-C_150303A				03/03/15 18:10
Calcium		81.1	mg/L	1.0		0	0	2.8	10	
Magnesium		11.9	mg/L	1.0		0	0	2.5	10	
Sodium		3460	mg/L	12		0	0	3.8	10	
Lab ID: C15020740-003ADUP	3	Sample Duplicate				Run: ICP4-C_150303A				03/03/15 18:14
Calcium		69.2	mg/L	1.0				13	30	
Magnesium		9.84	mg/L	1.0				16	30	
Sodium		3170	mg/L	2.4				4.9	30	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: EOG Resources Inc
Project: GC 12-19H PW Spill

Report Date: 03/06/15
Work Order: C15020740

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015B										Batch: 44030
Lab ID: LCS-44030	2	Laboratory Control Sample				Run: PIDELCD1-C_150227B				02/27/15 19:53
Total Purgeable Hydrocarbons		21.3	mg/kg	2.0	106	54.2	133			
Surr: Trifluorotoluene				0.40	112	53.8	137			
Lab ID: LCSD-44030	2	Laboratory Control Sample Duplicate				Run: PIDELCD1-C_150227B				02/27/15 20:30
Total Purgeable Hydrocarbons		20.8	mg/kg	2.0	104	54.2	133	2.2	20	
Surr: Trifluorotoluene				0.40	107	53.8	137			
Lab ID: MB-44030	3	Method Blank				Run: PIDELCD1-C_150227B				02/27/15 21:06
Gasoline Range Organics (GRO)		ND	mg/kg	2.0						
Total Purgeable Hydrocarbons		ND	mg/kg	2.0						
Surr: Trifluorotoluene				0.40	120	53.8	137			
Lab ID: C15020740-003AMS	2	Sample Matrix Spike				Run: PIDELCD1-C_150227B				02/28/15 03:11
Total Purgeable Hydrocarbons		21.4	mg/kg	4.0	107	22.4	153			
Surr: Trifluorotoluene				0.80	108	53.8	137			
Method: SW8015B										Batch: 44038
Lab ID: LCS-44038	2	Laboratory Control Sample				Run: FID1-C_150226B				02/26/15 23:48
Diesel Range Organics (DRO)		618	mg/kg	10	93	58.7	106			
Surr: o-Terphenyl				0.67	102	56	147			
Lab ID: LCSD-44038	2	Laboratory Control Sample Duplicate				Run: FID1-C_150226B				02/27/15 00:34
Diesel Range Organics (DRO)		596	mg/kg	10	89	58.7	106	3.7	20	
Surr: o-Terphenyl				0.67	86	56	147			
Lab ID: C15020667-001AMS	2	Sample Matrix Spike				Run: FID1-C_150226B				02/27/15 07:28
Diesel Range Organics (DRO)		588	mg/kg	10	87	60	140			
Surr: o-Terphenyl				0.67	96	56	147			
Lab ID: C15020667-001AMSD	2	Sample Matrix Spike Duplicate				Run: FID1-C_150226B				02/27/15 08:14
Diesel Range Organics (DRO)		575	mg/kg	10	86	60	140	2.2	20	
Surr: o-Terphenyl				0.67	95	56	147			
Lab ID: MB-44038	2	Method Blank				Run: FID1-C_150226B				02/27/15 23:46
Diesel Range Organics (DRO)		ND	mg/kg	10						
Surr: o-Terphenyl				0.67	73	56	147			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

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Client: EOG Resources Inc
Project: GC 12-19H PW Spill

Report Date: 03/06/15
Work Order: C15020740

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: USDA27a										Batch: 44061
Lab ID: LCS1-44061	Laboratory Control Sample									Run: SARTORIUS CP3202_150303 03/03/15 10:07
Saturation		57.7	%	0.10	113	80	120			
Lab ID: C15020740-003ADUP	Sample Duplicate									Run: SARTORIUS CP3202_150303 03/03/15 10:08
Saturation		21.6	%	0.10				6.7	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Work Order Receipt Checklist

EOG Resources Inc

C15020740

Login completed by: Leslie S. Cadreau

Date Received: 2/25/2015

Reviewed by: BL2000\khamre

Received by: ckw

Reviewed Date: 2/26/2015

Carrier name: Ground

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	19.4 °C No Ice		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

One container for sample 1-4 GC 12-19H was received broken. Ok to proceed with analyses with remaining containers.

Per Corinne Wagner, Project Manager, containers 1, 2, 3 and 4 GC 12-19H are one sample.

[illegible]

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly noted on your analytical report. Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.