

November 11, 2014

Justin Booth
HES Ops Advisor
OXY USA WTP LP
760 Horizon Drive, Suite 101
Grand Junction, Colorado 81506

**RE: Spill Characterization and Closure Report
Oxy Central Water Handling Facility – Filter Pod spill
Garfield County, Colorado
COGCC Spill Facility ID 439249**

Dear Mr. Booth:

The Central Water Handling Facility (site) is a produced water handling facility operated by OXY USA WTP LP (Oxy). This report summarized Olsson Associates, Inc. (Olsson) impacted soil characterization activities and closure recommendations with respect to the Filter Pod Spill which occurred on October 5, 2014.

SITE SETTING

The site is located north of the terminus of County Road 213 (Conn Creek Road) west of Conn Creek in the SE quarter of the SW quarter of Section 29, Township 6 South, and Range 97 West in Garfield County, Colorado, see attached Figure 1.

CHARACTERIZATION ACTIVITIES

Olsson conducted characterization sampling of the produced water spill path on October 7, 2014. Five surface soil samples were collected within the spill path for characterization, see attached Figure 2 for sample locations. All soil samples were collected from within the visibly wet spill path with varying degrees of salt staining present.

The characterization sample results identified exceedances of electrical conductivity (EC) at the Tier 2 W sampling location and sodium adsorption ratio (SAR) at the Tier 2 W, Tier 1 E, and Tier 1 N locations.

SUMMARY AND RECOMMENDATIONS

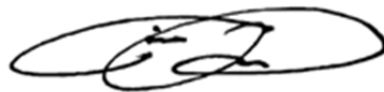
Characterization sampling conducted on October 7, 2014 identified EC and SAR exceedances at various locations within the Filter Pod spill path. Based on the spill sample results, Oxy will cap the location with at least three feet of native material once the Central Water Handling Facility is closed in order to address COGCC rules for elevated concentrations of EC and SAR.

Thank you for allowing Olsson Associates the opportunity to complete this work for OXY USA WTP LP. Please let me know if you have any questions with the provided information.

Sincerely,
Olsson Associates, Inc.



Blair Rollins
Environmental Scientist



Tim Dobransky, CHMM
Senior Scientist

Cc: File
Attachments

CWHF Filter Pod spill sampling

Pad #:	CWHF
Sample Date:	

		Lab Report #	L571168	L726190	L726190	L726190	L726190	L726190
		Date Sampled	4/17/2012	10/7/2014	10/7/2014	10/7/2014	10/7/2014	10/7/2014
		Sample Name	CS-C PT 63 10"	Tier 2 E	Tier 2 W	Tier 1 E	Tier 1 Source	Tier 1 N
		Sample Type	Background	Characterization	Characterization	Characterization	Characterization	Characterization
Organics in Soil	MCL (mg/Kg)							
TPH - GRO	500			BDL	7.7	BDL	BDL	42.0
TPH - DRO			22.0	59.0	90.0	38.0	75.0	
Benzene		0.17	BDL	BDL	BDL	BDL	0.14	
Toluene		85	BDL	BDL	BDL	BDL	0.79	
Ethylbenzene		100	BDL	BDL	BDL	BDL	0.05	
Xylenes		175	BDL	BDL	BDL	BDL	1.80	
Organics in Soil (PAH's)								
Acenaphthene	1000		BDL	BDL	BDL	BDL	0.0066	
Anthracene	1000		BDL	BDL	BDL	BDL	BDL	
Benzo(A)anthracene	0.22		BDL	0.012	BDL	BDL	BDL	
Benzo(B)fluoranthene	0.22		BDL	0.016	BDL	BDL	BDL	
Benzo(K)fluoranthene	2.2		BDL	BDL	BDL	BDL	BDL	
Benzo(A)pyrene	0.022		BDL	0.010	BDL	BDL	BDL	
Chrysene	22		BDL	0.013	BDL	BDL	BDL	
Dibenzo(A,H)anthracene	0.022		BDL	BDL	BDL	BDL	BDL	
Fluoranthene	1000		BDL	0.019	BDL	BDL	BDL	
Flourene	1000		BDL	BDL	BDL	BDL	0.02	
Indeno(1,2,3,C,D)pyrene	0.22		BDL	BDL	BDL	BDL	BDL	
Napthalene	23		BDL	BDL	BDL	BDL	0.16	
Pyrene	1000		BDL	0.022	BDL	0.0063	BDL	
Inorganics in Soil								
EC	<4 mmhos/cm or 2X background		1.1	6.3	2.30	2.60	3.10	
SAR	<12		0.5	26.0	14.0	12.0	29.0	
pH	6-9		6.4	7.3	7.50	7.40	7.70	
Metals in Soils								
Arsenic	0.39	20.0	14.0	15.0	11	18	13	
Barium (LDNR True Total)	15,000		320.0	360.0	330	420	520	
Cadmium	70		BDL	BDL	BDL	BDL	BDL	
Chromium III	120,000		23.0	20.0	BDL	BDL	BDL	
Chromium VI	23		BDL	BDL	19	20	19	
Copper	3100		18.0	20.0	23	23	20	
Lead	400		9.9	8.3	8	12	9	
Mercury	23		BDL	BDL	BDL	BDL	0.021	
Nickel	1600		22.0	24.0	24	19	20	
Selenium	390		BDL	2.2	BDL	BDL	2.90	
Silver	390		BDL	BDL	BDL	BDL	BDL	
Zinc	23,000		54.0	45.0	51	61	56	



OXY USA WTP LP

760 Horizon Drive, Suite 101
Grand Junction, CO 81506

OXY CWHF Location Map

Map Revised: Nov 11, 2014 Garfield County, Colorado

0 0.4 0.8 1.2 1.6 2 Miles

OXY Central Water
Handling Facility

T6S-R98W






T6S-R97W

T7S-R98W

T7S-R97W

213 - CONN CREEK RD

GarCo 204 - ROME CREEK DR

-  Central Water Handling Facility
-  Oxy responsible road
-  Unimproved Public Road
-  Gravel Public Road
-  Paved Public Road

CWHF Filter Pod Sample Map

Map Revised: Nov 11, 2014 Garfield County, Colorado

0 0.006 0.012 0.018 0.024 0.03 Miles





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Est. 1970

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

Report Summary

Monday October 13, 2014

Report Number: L726190

Samples Received: 10/08/14

Client Project:

Description: CWHF FP Spill

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

October 13, 2014

Date Received : October 08, 2014
Description : CWHF FP Spill
Sample ID : TIER 2 E
Collected By : Blair Rollins
Collection Date : 10/07/14 10:00

ESC Sample # : L726190-01

Site ID : CWHF FP

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	10/13/14	1
Chromium, Trivalent	23.	2.0	mg/kg	Calc.	10/13/14	1
ORP	160		mV	2580 B-2011	10/10/14	1
pH	6.4		su	9045D	10/10/14	1
Sodium Adsorption Ratio	0.50			Calc.	10/12/14	1
Specific Conductance	1100		umhos/cm	9050AMod	10/10/14	1
Mercury	BDL	0.020	mg/kg	7471	10/09/14	1
Arsenic	14.	2.0	mg/kg	6010B	10/09/14	1
Barium	320	0.50	mg/kg	6010B	10/09/14	1
Cadmium	BDL	0.50	mg/kg	6010B	10/09/14	1
Chromium	23.	1.0	mg/kg	6010B	10/09/14	1
Copper	18.	2.0	mg/kg	6010B	10/09/14	1
Lead	9.9	0.50	mg/kg	6010B	10/10/14	1
Nickel	22.	2.0	mg/kg	6010B	10/09/14	1
Selenium	BDL	2.0	mg/kg	6010B	10/09/14	1
Silver	BDL	1.0	mg/kg	6010B	10/09/14	1
Zinc	54.	5.0	mg/kg	6010B	10/10/14	1
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	8015D/GRO	10/10/14	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	93.9		% Rec.	8015D/GRO	10/10/14	5
Benzene	BDL	0.0050	mg/kg	8260B	10/09/14	5
Toluene	BDL	0.025	mg/kg	8260B	10/09/14	5
Ethylbenzene	BDL	0.0050	mg/kg	8260B	10/09/14	5
Total Xylenes	BDL	0.015	mg/kg	8260B	10/09/14	5
Surrogate Recovery						
Toluene-d8	106.		% Rec.	8260B	10/09/14	5
Dibromofluoromethane	103.		% Rec.	8260B	10/09/14	5
a,a,a-Trifluorotoluene	113.		% Rec.	8260B	10/09/14	5
4-Bromofluorobenzene	105.		% Rec.	8260B	10/09/14	5
TPH (GC/FID) High Fraction	22.	4.0	mg/kg	3546/DRO	10/10/14	1
Surrogate recovery(%) o-Terphenyl	53.2		% Rec.	3546/DRO	10/10/14	1

Polynuclear Aromatic Hydrocarbons

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L726190-01 (PH) - 6.4@21.6c



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

October 13, 2014

Date Received : October 08, 2014
Description : CWHF FP Spill

Sample ID : TIER 2 E

Collected By : Blair Rollins
Collection Date : 10/07/14 10:00

ESC Sample # : L726190-01

Site ID : CWHF FP

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Naphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
1-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
2-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
Surrogate Recovery						
p-Terphenyl-d14	86.2		% Rec.	8270C-SIM	10/10/14	1
Nitrobenzene-d5	102.		% Rec.	8270C-SIM	10/10/14	1
2-Fluorobiphenyl	82.0		% Rec.	8270C-SIM	10/10/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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L726190-01 (PH) - 6.4@21.6c



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

October 13, 2014

Date Received : October 08, 2014
Description : CWHF FP Spill

ESC Sample # : L726190-02

Sample ID : TIER 2 W

Site ID : CWHF FP

Collected By : Blair Rollins
Collection Date : 10/07/14 10:10

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	10/13/14	1
Chromium, Trivalent	20.	2.0	mg/kg	Calc.	10/13/14	1
ORP	150		mV	2580 B-2011	10/10/14	1
pH	7.3		su	9045D	10/10/14	1
Sodium Adsorption Ratio	26.			Calc.	10/12/14	1
Specific Conductance	6300		umhos/cm	9050AMod	10/10/14	1
Mercury	BDL	0.020	mg/kg	7471	10/09/14	1
Arsenic	15.	2.0	mg/kg	6010B	10/09/14	1
Barium	360	0.50	mg/kg	6010B	10/09/14	1
Cadmium	BDL	0.50	mg/kg	6010B	10/09/14	1
Chromium	20.	1.0	mg/kg	6010B	10/09/14	1
Copper	20.	2.0	mg/kg	6010B	10/09/14	1
Lead	8.3	0.50	mg/kg	6010B	10/10/14	1
Nickel	24.	2.0	mg/kg	6010B	10/09/14	1
Selenium	2.2	2.0	mg/kg	6010B	10/09/14	1
Silver	BDL	1.0	mg/kg	6010B	10/09/14	1
Zinc	45.	5.0	mg/kg	6010B	10/10/14	1
TPH (GC/FID) Low Fraction	7.7	0.50	mg/kg	8015D/GRO	10/10/14	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	92.0		% Rec.	8015D/GRO	10/10/14	5
Benzene	BDL	0.0050	mg/kg	8260B	10/09/14	5
Toluene	BDL	0.025	mg/kg	8260B	10/09/14	5
Ethylbenzene	BDL	0.0050	mg/kg	8260B	10/09/14	5
Total Xylenes	BDL	0.015	mg/kg	8260B	10/09/14	5
Surrogate Recovery						
Toluene-d8	106.		% Rec.	8260B	10/09/14	5
Dibromofluoromethane	100.		% Rec.	8260B	10/09/14	5
a,a,a-Trifluorotoluene	111.		% Rec.	8260B	10/09/14	5
4-Bromofluorobenzene	110.		% Rec.	8260B	10/09/14	5
TPH (GC/FID) High Fraction	59.	4.0	mg/kg	3546/DRO	10/12/14	1
Surrogate recovery(%) o-Terphenyl	36.0		% Rec.	3546/DRO	10/12/14	1

Polynuclear Aromatic Hydrocarbons

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L726190-02 (PH) - 7.3@21.5c



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

October 13, 2014

Date Received : October 08, 2014
Description : CWHF FP Spill

Sample ID : TIER 2 W

Collected By : Blair Rollins
Collection Date : 10/07/14 10:10

ESC Sample # : L726190-02

Site ID : CWHF FP

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(a)anthracene	0.012	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(a)pyrene	0.010	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(b)fluoranthene	0.016	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(g,h,i)perylene	0.0072	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Chrysene	0.013	0.0060	mg/kg	8270C-SIM	10/10/14	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Fluoranthene	0.019	0.0060	mg/kg	8270C-SIM	10/10/14	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Naphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
Phenanthrene	0.0078	0.0060	mg/kg	8270C-SIM	10/10/14	1
Pyrene	0.022	0.0060	mg/kg	8270C-SIM	10/10/14	1
1-Methylnaphthalene	0.022	0.020	mg/kg	8270C-SIM	10/10/14	1
2-Methylnaphthalene	0.053	0.020	mg/kg	8270C-SIM	10/10/14	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
Surrogate Recovery						
p-Terphenyl-d14	87.1		% Rec.	8270C-SIM	10/10/14	1
Nitrobenzene-d5	128.		% Rec.	8270C-SIM	10/10/14	1
2-Fluorobiphenyl	88.2		% Rec.	8270C-SIM	10/10/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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L726190-02 (PH) - 7.3@21.5c



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

October 13, 2014

Date Received : October 08, 2014
Description : CWHF FP Spill

ESC Sample # : L726190-03

Sample ID : TIER 1 E

Site ID : CWHF FP

Collected By : Blair Rollins
Collection Date : 10/07/14 10:20

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	10/13/14	1
Chromium, Trivalent	19.	2.0	mg/kg	Calc.	10/13/14	1
ORP	130		mV	2580 B-2011	10/10/14	1
pH	7.5		su	9045D	10/10/14	1
Sodium Adsorption Ratio	14.			Calc.	10/12/14	1
Specific Conductance	2300		umhos/cm	9050AMod	10/10/14	1
Mercury	BDL	0.020	mg/kg	7471	10/09/14	1
Arsenic	11.	2.0	mg/kg	6010B	10/09/14	1
Barium	330	0.50	mg/kg	6010B	10/09/14	1
Cadmium	BDL	0.50	mg/kg	6010B	10/09/14	1
Chromium	19.	1.0	mg/kg	6010B	10/09/14	1
Copper	23.	2.0	mg/kg	6010B	10/09/14	1
Lead	7.7	0.50	mg/kg	6010B	10/10/14	1
Nickel	24.	2.0	mg/kg	6010B	10/09/14	1
Selenium	BDL	2.0	mg/kg	6010B	10/09/14	1
Silver	BDL	1.0	mg/kg	6010B	10/09/14	1
Zinc	51.	5.0	mg/kg	6010B	10/10/14	1
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	8015D/GRO	10/10/14	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	92.3		% Rec.	8015D/GRO	10/10/14	5
Benzene	BDL	0.0050	mg/kg	8260B	10/09/14	5
Toluene	BDL	0.025	mg/kg	8260B	10/09/14	5
Ethylbenzene	BDL	0.0050	mg/kg	8260B	10/09/14	5
Total Xylenes	BDL	0.015	mg/kg	8260B	10/09/14	5
Surrogate Recovery						
Toluene-d8	104.		% Rec.	8260B	10/09/14	5
Dibromofluoromethane	101.		% Rec.	8260B	10/09/14	5
a,a,a-Trifluorotoluene	108.		% Rec.	8260B	10/09/14	5
4-Bromofluorobenzene	104.		% Rec.	8260B	10/09/14	5
TPH (GC/FID) High Fraction	90.	4.0	mg/kg	3546/DRO	10/12/14	1
Surrogate recovery(%) o-Terphenyl	49.3		% Rec.	3546/DRO	10/12/14	1

Polynuclear Aromatic Hydrocarbons

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L726190-03 (PH) - 7.5@21.3c



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

October 13, 2014

Date Received : October 08, 2014
Description : CWHF FP Spill

Sample ID : TIER 1 E

Collected By : Blair Rollins
Collection Date : 10/07/14 10:20

ESC Sample # : L726190-03

Site ID : CWHF FP

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Naphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
1-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
2-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
Surrogate Recovery						
p-Terphenyl-d14	88.2		% Rec.	8270C-SIM	10/10/14	1
Nitrobenzene-d5	116.		% Rec.	8270C-SIM	10/10/14	1
2-Fluorobiphenyl	88.5		% Rec.	8270C-SIM	10/10/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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L726190-03 (PH) - 7.5@21.3c



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

October 13, 2014

Date Received : October 08, 2014
Description : CWHF FP Spill
Sample ID : TIER 1 SOURCE
Collected By : Blair Rollins
Collection Date : 10/07/14 10:30

ESC Sample # : L726190-04

Site ID : CWHF FP

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium,Hexavalent	BDL	2.0	mg/kg	3060A/7196A	10/13/14	1
Chromium,Trivalent	20.	2.0	mg/kg	Calc.	10/13/14	1
ORP	140		mV	2580 B-2011	10/10/14	1
pH	7.4		su	9045D	10/10/14	1
Sodium Adsorption Ratio	12.			Calc.	10/12/14	1
Specific Conductance	2600		umhos/cm	9050AMod	10/10/14	1
Mercury	BDL	0.020	mg/kg	7471	10/09/14	1
Arsenic	18.	2.0	mg/kg	6010B	10/09/14	1
Barium	420	0.50	mg/kg	6010B	10/09/14	1
Cadmium	BDL	0.50	mg/kg	6010B	10/09/14	1
Chromium	20.	1.0	mg/kg	6010B	10/09/14	1
Copper	23.	2.0	mg/kg	6010B	10/09/14	1
Lead	12.	0.50	mg/kg	6010B	10/10/14	1
Nickel	19.	2.0	mg/kg	6010B	10/09/14	1
Selenium	BDL	2.0	mg/kg	6010B	10/09/14	1
Silver	BDL	1.0	mg/kg	6010B	10/09/14	1
Zinc	61.	5.0	mg/kg	6010B	10/10/14	1
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	8015D/GRO	10/10/14	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	93.8		% Rec.	8015D/GRO	10/10/14	5
Benzene	BDL	0.0050	mg/kg	8260B	10/09/14	5
Toluene	BDL	0.025	mg/kg	8260B	10/09/14	5
Ethylbenzene	BDL	0.0050	mg/kg	8260B	10/09/14	5
Total Xylenes	BDL	0.015	mg/kg	8260B	10/09/14	5
Surrogate Recovery						
Toluene-d8	104.		% Rec.	8260B	10/09/14	5
Dibromofluoromethane	101.		% Rec.	8260B	10/09/14	5
a,a,a-Trifluorotoluene	109.		% Rec.	8260B	10/09/14	5
4-Bromofluorobenzene	107.		% Rec.	8260B	10/09/14	5
TPH (GC/FID) High Fraction	38.	4.0	mg/kg	3546/DRO	10/10/14	1
Surrogate recovery(%) o-Terphenyl	54.9		% Rec.	3546/DRO	10/10/14	1

Polynuclear Aromatic Hydrocarbons

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L726190-04 (PH) - 7.4@21.4c



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

October 13, 2014

Date Received : October 08, 2014
Description : CWHF FP Spill

Sample ID : TIER 1 SOURCE

Collected By : Blair Rollins
Collection Date : 10/07/14 10:30

ESC Sample # : L726190-04

Site ID : CWHF FP

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Naphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Pyrene	0.0063	0.0060	mg/kg	8270C-SIM	10/10/14	1
1-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
2-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
Surrogate Recovery						
p-Terphenyl-d14	82.4		% Rec.	8270C-SIM	10/10/14	1
Nitrobenzene-d5	105.		% Rec.	8270C-SIM	10/10/14	1
2-Fluorobiphenyl	87.3		% Rec.	8270C-SIM	10/10/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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L726190-04 (PH) - 7.4@21.4c



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

October 13, 2014

Date Received : October 08, 2014
Description : CWHF FP Spill

Sample ID : TIER 1 N

Collected By : Blair Rollins
Collection Date : 10/07/14 10:40

ESC Sample # : L726190-05

Site ID : CWHF FP

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium,Hexavalent	BDL	2.0	mg/kg	3060A/7196A	10/13/14	1
Chromium,Trivalent	19.	2.0	mg/kg	Calc.	10/13/14	1
ORP	120		mV	2580 B-2011	10/10/14	1
pH	7.7		su	9045D	10/10/14	1
Sodium Adsorption Ratio	29.			Calc.	10/12/14	1
Specific Conductance	3100		umhos/cm	9050AMod	10/10/14	1
Mercury	0.021	0.020	mg/kg	7471	10/09/14	1
Arsenic	13.	2.0	mg/kg	6010B	10/09/14	1
Barium	520	0.50	mg/kg	6010B	10/09/14	1
Cadmium	BDL	0.50	mg/kg	6010B	10/09/14	1
Chromium	19.	1.0	mg/kg	6010B	10/09/14	1
Copper	20.	2.0	mg/kg	6010B	10/09/14	1
Lead	8.9	0.50	mg/kg	6010B	10/10/14	1
Nickel	20.	2.0	mg/kg	6010B	10/09/14	1
Selenium	2.9	2.0	mg/kg	6010B	10/09/14	1
Silver	BDL	1.0	mg/kg	6010B	10/09/14	1
Zinc	56.	5.0	mg/kg	6010B	10/10/14	1
TPH (GC/FID) Low Fraction	42.	2.5	mg/kg	8015D/GRO	10/12/14	25
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	82.2		% Rec.	8015D/GRO	10/12/14	25
Benzene	0.14	0.0050	mg/kg	8260B	10/09/14	5
Toluene	0.79	0.12	mg/kg	8260B	10/11/14	25
Ethylbenzene	0.052	0.0050	mg/kg	8260B	10/09/14	5
Total Xylenes	1.8	0.015	mg/kg	8260B	10/09/14	5
Surrogate Recovery						
Toluene-d8	107.		% Rec.	8260B	10/09/14	5
Dibromofluoromethane	99.1		% Rec.	8260B	10/09/14	5
a,a,a-Trifluorotoluene	107.		% Rec.	8260B	10/09/14	5
4-Bromofluorobenzene	121.		% Rec.	8260B	10/09/14	5
TPH (GC/FID) High Fraction	75.	4.0	mg/kg	3546/DRO	10/12/14	1
Surrogate recovery(%) o-Terphenyl	38.4		% Rec.	3546/DRO	10/12/14	1

Polynuclear Aromatic Hydrocarbons

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L726190-05 (PH) - 7.7@21.3c



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Est. 1970

REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

October 13, 2014

Date Received : October 08, 2014
Description : CWHF FP Spill

ESC Sample # : L726190-05

Sample ID : TIER 1 N

Site ID : CWHF FP

Collected By : Blair Rollins
Collection Date : 10/07/14 10:40

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Acenaphthene	0.0066	0.0060	mg/kg	8270C-SIM	10/10/14	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Fluorene	0.018	0.0060	mg/kg	8270C-SIM	10/10/14	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
Naphthalene	0.16	0.020	mg/kg	8270C-SIM	10/10/14	1
Phenanthrene	0.013	0.0060	mg/kg	8270C-SIM	10/10/14	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/10/14	1
1-Methylnaphthalene	0.12	0.020	mg/kg	8270C-SIM	10/10/14	1
2-Methylnaphthalene	0.33	0.020	mg/kg	8270C-SIM	10/10/14	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	10/10/14	1
Surrogate Recovery						
p-Terphenyl-d14	85.9		% Rec.	8270C-SIM	10/10/14	1
Nitrobenzene-d5	143.		% Rec.	8270C-SIM	10/10/14	1
2-Fluorobiphenyl	90.8		% Rec.	8270C-SIM	10/10/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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L726190-05 (PH) - 7.7@21.3c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L726190-02	WG748049	SAMP	o-Terphenyl	R2997009	J2
L726190-03	WG748049	SAMP	o-Terphenyl	R2997009	J2
L726190-05	WG748049	SAMP	o-Terphenyl	R2997009	J2

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
10/13/14 at 15:32:13

TSR Signing Reports: 134
R4 - Rush: Three Day

Add EDD Log BTEX by 8260 unless otherwise noted

Sample: L726190-01 Account: OXYGJCO Received: 10/08/14 09:00 Due Date: 10/13/14 00:00 RPT Date: 10/13/14 15:31

Sample: L726190-02 Account: OXYGJCO Received: 10/08/14 09:00 Due Date: 10/13/14 00:00 RPT Date: 10/13/14 15:31

Sample: L726190-03 Account: OXYGJCO Received: 10/08/14 09:00 Due Date: 10/13/14 00:00 RPT Date: 10/13/14 15:31

Sample: L726190-04 Account: OXYGJCO Received: 10/08/14 09:00 Due Date: 10/13/14 00:00 RPT Date: 10/13/14 15:31

Sample: L726190-05 Account: OXYGJCO Received: 10/08/14 09:00 Due Date: 10/13/14 00:00 RPT Date: 10/13/14 15:31