

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax 894-2109



FOR OGCC USE ONLY

#6944

RECEIVED
3/30/2012

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

Spill Complaint
 Inspection NOAV

Tracking No: 2223045

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

Spill or Release Plug & Abandon Central Facility Closure Site/Facility Closure Other (describe): _____

GENERAL INFORMATION

OGCC Operator Number: 69175		Contact Name and Telephone	
Name of Operator: <u>Petroleum Development Corporation</u>		Name: <u>Brandon Bruns</u>	
Address: <u>1775 Sherman Street, Suite 3000</u>		No: <u>(303) 860-5800</u>	
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80203</u>		Fax: <u>(303) 860-5838</u>	
API/Facility No: <u>05-123-25980</u>		County: <u>Weld</u>	
Facility Name: <u>Zimmerman 11D, 12, 21D, 22-17U</u>		Facility Number: <u>05-123-25980</u>	
Well Name: <u>Zimmerman 11D, 12, 21D, 22-17U</u>		Well Number: <u>Zimmerman 11D, 12, 21D, 22-17U</u>	
Location (QtrQtr, Sec, Twp, Rng, Meridian): <u>SWNW 17 T5N R67W 6th PM</u>		Latitude: <u>40.40071</u> Longitude: <u>-104.9243</u>	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Condensate

Site Conditions: Is location within a sensitive area (according to Rule 901e)? Y N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Cultivated.

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Silt/Sand

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water area is located approximately 2,900' to the southwest of the Tank Battery, and residential buildings are located ~700' west; depth to groundwater is estimated to be >17 ft bgs.

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>Form 19 submitted on February 27, 2012</u>	<u>Excavation, geoprobing, and soil sampling</u>
<input type="checkbox"/> Vegetation	_____	_____
<input type="checkbox"/> Groundwater	_____	_____
<input type="checkbox"/> Surface water	_____	_____

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

The Immediate response action was provided in a Form 19 submitted on February 27, 2012. An aerial map of the site is included on Figure 1.

Describe how source is to be removed:

The source area was previously excavated and impacted material was transported and disposed of as described in the Form 19 submitted on February 27, 2012.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

PDC plans to inject a chemical oxidant (chemox) to address residual hydrocarbon mass within the subsurface. The chemox will be injected to the subsurface through one monitoring (BH-01) well that was installed during investigation activities (illustrated on Figure 2), as well as one geoprobe injection location to be field located within the vicinity of the hydrocarbon plume. PDC will subsequently conduct geoprobing and soil sampling activities near the monitoring well and the geoprobe location to determine if injection activities successfully remediated residual hydrocarbon impacts to COGCC Table 910-1 limits. Should confirmation samples indicate that concentrations are below the COGCC Table 910-1 limits for hydrocarbon impacts, an NFA letter will be submitted to the COGCC and the temporary monitoring locations will be abandoned. However, should the samples indicate that hydrocarbon impacts continue to exceed the Table 910-1 limits, PDC will evaluate further remedial alternatives.



Tracking Number: _____
 Name of Operator: Petroleum Development Corporation
 OGCC Operator No: 69175
 Received Date: _____
 Well Name & No: Zimmerman 11D, 12, 21D, 22-17U
 Facility Name & No.: Zimmerman 11D, 12, 21D, 22-17U

REMEDIATION WORKPLAN (CONT.)

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):
Groundwater was not encountered during excavation or geoprobing activities.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.
The area where the excavation is located is used as the secondary bermed area for the Site separators and partially as an equipment access area to the location tank battery and consists of road base. The excavation has been backfilled and compacted with clean material and the ground surface was contoured to match pre-existing conditions.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.
Is further site investigation required? Y N If yes, describe:
The hydrocarbon plume has been delineated and no further susurface investigation is required at the site. Laboratory analytical results from soil samples that were collected during excavation and geoprobing activities indicate that low hydrocarbon impacts exist beneath the extents of the previous excavation. The laboratory analytical results are provided in Table 1 and the temporary monitoring well locations are illustrated on Figure 2.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):
Waste was disposed of at the Waste Management Facility in Ault, CO.

IMPLEMENTATION SCHEDULE

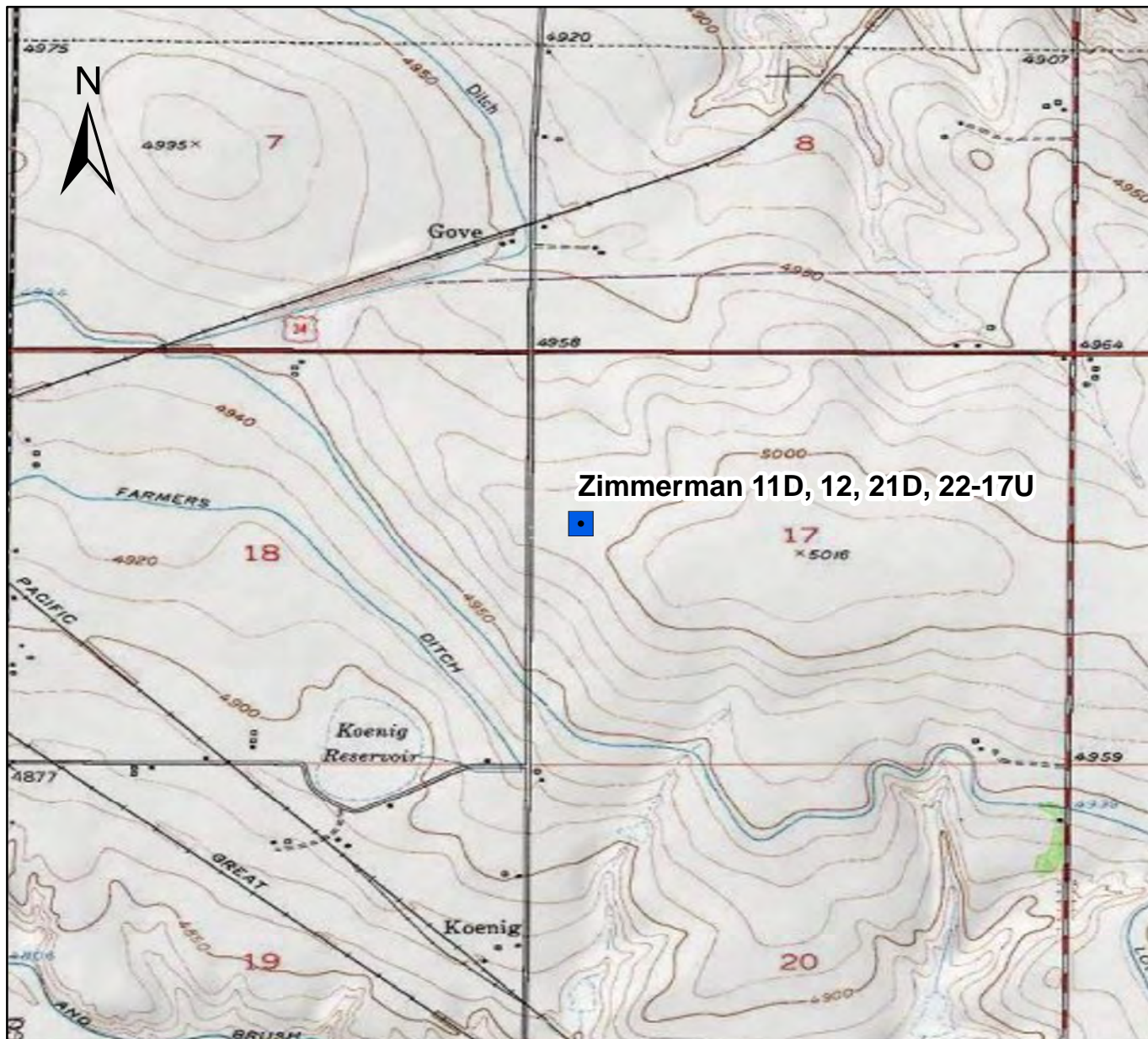
Date Site Investigation Began: <u>11/23/2011</u>	Date Site Investigation Completed: <u>1/24/12</u>	Remediation Plan Submitted: _____
Remediation Start Date: <u>11/23/2011</u>	Anticipated Completion Date: <u>NA</u>	Actual Completion Date: _____

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

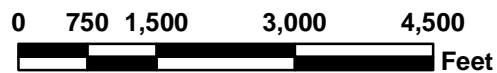
Print Name: Brandon Bruns

Signed: *Brandon Bruns* Title: EHS Professional Date: 3/30/12

OGCC Approved: *John Axelson* FOR Title: John Axelson Date: 04/12/2012
EPS NE Region



Zimmerman 11D, 12, 21D, 22-17U



Site Location

Figure 1

Site Location Map
 Zimmerman 11D, 12, 21D, 22-17U
 SWNW S17 T5N R67W
 Weld County, Colorado

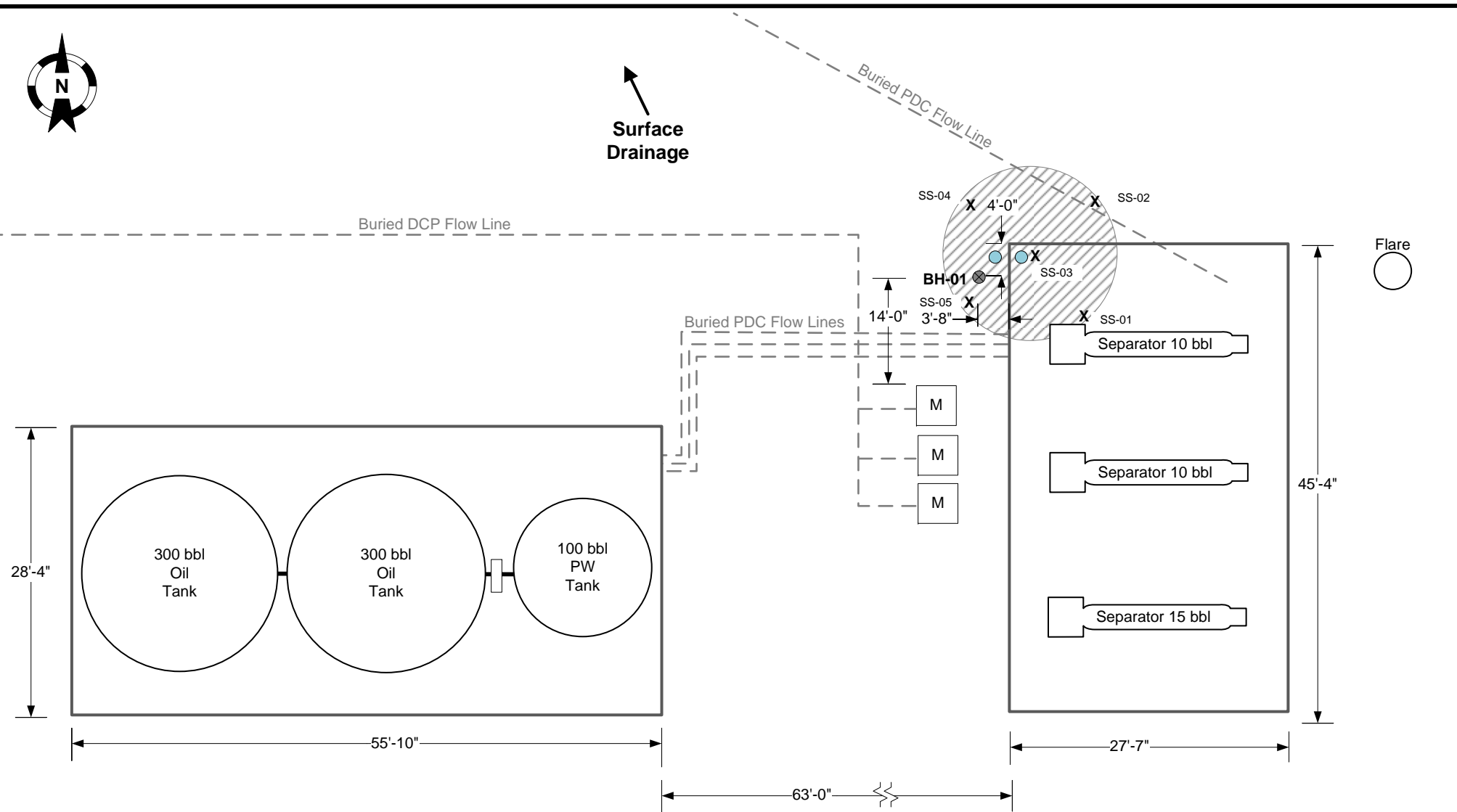


Drawn By: CAW
 Date: 02/20/2012

Tasman Geosciences



Surface
Drainage



PROJECT NO:
DRAWN BY: BDH
DATE: 1-30-2012

Facility Diagram
PDC Energy – DJ Basin
Zimmerman 11D, 12D, 21D, 22-17U, 17AD U
Township 5N Range 67W Section 17
Weld County, CO



5690 Webster Avenue
Arvada CO 80002

LEGEND	
	Steel Berm
	Bore Hole Location
	Bore Hole Location With Temporary Well Installed
	Approximate Extent of Excavation
	Excavation Soil Sample
	Meter Shed
	4' Riser Installed for Future Remediation Use

FIGURE 2
Not to Scale

TABLE 1
ZIMMERMAN 11D, 12, 21D, 22-17U
SOIL ANALYTICAL RESULTS TABLE

Sample ID	Date Sampled	Depth (Feet bgs)	PID Readings (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzne (mg/kg)	Total Xylenes (mg/kg)	Napthalene (mg/kg)	TPH ⁽²⁾ (mg/kg)
SS01@17'	11/23/2011	17	78	ND	ND	ND	ND	ND	ND
SS02@17'	11/23/2011	17	101	ND	ND	ND	ND	ND	ND
SS03@21'	11/23/2011	21	1,222	1.6	12	6.3	33	2.5	4,420
SS04@17'	11/23/2011	17	50.7	ND	ND	ND	ND	ND	ND
SS05@17'	11/23/2011	17	14.4	ND	ND	ND	ND	ND	ND
COGCC standards for Soil (mg/kg) ⁽¹⁾				0.17	85	100	175	23	500

Notes:

1). Standards for Soil are taken from 2 CCR 404-1, Table 910-1, effective April 1, 2009.

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

GRO - Gasoline range organics.

DRO - Diesel range organics.

mg/kg= Milligrams per kilogram.

bgs - Below ground surface.

ppm - Parts per million

ND- Not Detected

Bold red values indicate an exceedance of the COGCC soil standards for the Site.

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 24, 2011

Brian Dodek

LT Environmental, Inc.

4600 West 60th Avenue

Arvada, CO 80003

RE: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Enclosed are the results of analyses for samples received by Summit Scientific on 11/23/11 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury
President / Laboratory Director



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@17'	R111177-01	Soil	11/23/11 10:20	11/23/11 17:00
SS02@17'	R111177-02	Soil	11/23/11 10:25	11/23/11 17:00
SS03@21'	R111177-03	Soil	11/23/11 10:30	11/23/11 17:00
SS04@17'	R111177-04	Soil	11/23/11 10:35	11/23/11 17:00
SS05@17'	R111177-05	Soil	11/23/11 10:40	11/23/11 17:00

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

Summit Scientific ^{S2} R11177

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 • 303-277-9331 Fax

Page 1 of 1

Client: LT Environmental, Inc. Project Manager: Brian Dodek
Address: 4600 West 60th Avenue E-Mail: bdodek@ltenv.com
City/State/Zip: Arvada, CO 80003 Project Name: Zimmerman 11D, 12, 21D, 22-17U, 17ADU
Phone: (303) 433-9788 Fax: (303) 433-1432 Project Number: 0188/10
Sampler Name: Devin Gartin

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:				Special Instructions	Notes		
				HCl	HNO ₃	Zone	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	DRO	GBTEX / Metals	BTEX	PH / EC			SAR	Table 910.1 metals
S501 @ 17'	11-23-11	1020	1		X				X										
S502 @ 17'		1035	1		X				X										
S503 @ 24'		1030	1		X				X										
S504 @ 17'		1035	1		X				X										
S505 @ 17'		1040	1		X				X										
Relinquished by:	Date/Time:	1700																	
Relinquished by:	Date/Time:	11-23-11																	
Relinquished by:	Date/Time:																		



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

SS01@17'
R111177-01 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: 11/23/11 10:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1112305	11/23/11	11/23/11	8015 DRO	

Date Sampled: 11/23/11 10:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		91.1 %	88.8-124		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 11/23/11 10:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	1112303	11/23/11	11/23/11	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
m,p-Xylene	ND	0.010	"	"	"	"	"	"	
o-Xylene	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 11/23/11 10:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	67.4-143		"	"	"	"	
Surrogate: Toluene-d8		97.9 %	77.3-114		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	78.4-125		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

SS02@17'
R111177-02 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: 11/23/11 10:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1112305	11/23/11	11/23/11	8015 DRO	

Date Sampled: 11/23/11 10:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		91.0 %	88.8-124		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 11/23/11 10:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	1112303	11/23/11	11/23/11	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
m,p-Xylene	ND	0.010	"	"	"	"	"	"	
<i>o</i> -Xylene	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 11/23/11 10:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane- <i>d</i> 4		113 %	67.4-143		"	"	"	"	
Surrogate: Toluene- <i>d</i> 8		98.7 %	77.3-114		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	78.4-125		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

SS03@21'
R111177-03 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: 11/23/11 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	3500	50	mg/kg	1	1112305	11/23/11	11/23/11	8015 DRO	

Date Sampled: 11/23/11 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		108 %	88.8-124		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 11/23/11 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	2.5	0.050	mg/kg	10	1112303	11/23/11	11/23/11	EPA 8260B	
Benzene	1.6	0.050	"	"	"	"	"	"	
Toluene	12	0.050	"	"	"	"	"	"	E
Ethylbenzene	6.3	0.050	"	"	"	"	"	"	E
m,p-Xylene	21	0.10	"	"	"	"	"	"	E
o-Xylene	12	0.050	"	"	"	"	"	"	E
Gasoline Range Hydrocarbons	920	5.0	"	"	"	"	"	"	E

Date Sampled: 11/23/11 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		101 %	67.4-143		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		111 %	77.3-114		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		100 %	78.4-125		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

SS04@17'
R111177-04 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: 11/23/11 10:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1112305	11/23/11	11/23/11	8015 DRO	

Date Sampled: 11/23/11 10:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		90.6 %	88.8-124		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 11/23/11 10:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	1112303	11/23/11	11/23/11	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
m,p-Xylene	ND	0.010	"	"	"	"	"	"	
<i>o</i> -Xylene	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 11/23/11 10:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	67.4-143		"	"	"	"	
Surrogate: Toluene-d8		76.2 %	77.3-114		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		113 %	78.4-125		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

SS05@17'
R111177-05 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: 11/23/11 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1112305	11/23/11	11/23/11	8015 DRO	

Date Sampled: 11/23/11 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		90.4 %	88.8-124		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 11/23/11 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	1112303	11/23/11	11/23/11	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
m,p-Xylene	ND	0.010	"	"	"	"	"	"	
<i>o</i> -Xylene	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 11/23/11 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane- <i>d</i> 4		112 %	67.4-143		"	"	"	"	
Surrogate: Toluene- <i>d</i> 8		98.0 %	77.3-114		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	78.4-125		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

Total Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1112305 - EPA 3550A

Blank (1112305-BLK1)				Prepared & Analyzed: 11/23/11							
C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	<i>12.9</i>		<i>"</i>	<i>12.5</i>	<i>103</i>	<i>88.8-124</i>					
LCS (1112305-BS1)				Prepared & Analyzed: 11/23/11							
C10-C28 (DRO)	492	50	mg/kg	501	98.3	81.4-129				9.26	
LCS Dup (1112305-BSD1)				Prepared & Analyzed: 11/23/11							
C10-C28 (DRO)	495	50	mg/kg	501	98.9	81.4-129	0.606			9.26	
Matrix Spike (1112305-MS1)				Source: R111162-01		Prepared & Analyzed: 11/23/11					
C10-C28 (DRO)	489	50	mg/kg	501	44.0	88.8	77.8-133			8.48	
Matrix Spike Dup (1112305-MSD1)				Source: R111162-01		Prepared & Analyzed: 11/23/11					
C10-C28 (DRO)	456	50	mg/kg	501	44.0	82.1	77.8-133	7.06		8.48	

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Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

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

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

Batch 1112303 - EPA 5030 Soil MS

Blank (1112303-BLK1)

Prepared & Analyzed: 11/23/11

Naphthalene	ND	0.0050	mg/kg							
Benzene	ND	0.0050	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
m,p-Xylene	ND	0.010	"							
o-Xylene	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>67.4-143</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0389</i>		<i>"</i>	<i>0.0400</i>		<i>97.2</i>	<i>77.3-114</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0390</i>		<i>"</i>	<i>0.0400</i>		<i>97.6</i>	<i>78.4-125</i>			

LCS (1112303-BS1)

Prepared & Analyzed: 11/23/11

Naphthalene	ND	0.0050	mg/kg				67.8-151		20	
Benzene	0.0873	0.0050	"	0.100		87.3	61-139	1.70	11.1	
Toluene	0.0882	0.0050	"	0.100		88.2	64-132	1.99	10.9	
Ethylbenzene	0.0958	0.0050	"	0.100		95.8	68.7-135	1.37	20	
m,p-Xylene	0.184	0.010	"	0.200		92.1	70.4-129	0.891	20	
o-Xylene	0.0923	0.0050	"	0.100		92.3	66.9-126	1.07	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0416</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>67.4-143</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0389</i>		<i>"</i>	<i>0.0400</i>		<i>97.3</i>	<i>77.3-114</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0390</i>		<i>"</i>	<i>0.0400</i>		<i>97.5</i>	<i>78.4-125</i>			

LCS Dup (1112303-BSD1)

Prepared & Analyzed: 11/23/11

Naphthalene	ND	0.0050	mg/kg				67.8-151		20	
Benzene	0.0888	0.0050	"	0.100		88.8	61-139	1.70	11.1	
Toluene	0.0899	0.0050	"	0.100		89.9	64-132	1.99	10.9	
Ethylbenzene	0.0971	0.0050	"	0.100		97.1	68.7-135	1.37	20	
m,p-Xylene	0.186	0.010	"	0.200		93.0	70.4-129	0.891	20	
o-Xylene	0.0933	0.0050	"	0.100		93.3	66.9-126	1.07	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0416</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>67.4-143</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0392</i>		<i>"</i>	<i>0.0400</i>		<i>97.9</i>	<i>77.3-114</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0392</i>		<i>"</i>	<i>0.0400</i>		<i>98.1</i>	<i>78.4-125</i>			

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

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

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

Batch 1112303 - EPA 5030 Soil MS

Matrix Spike (1112303-MS1)	Source: R111162-01			Prepared & Analyzed: 11/23/11							
Naphthalene	ND	0.0050	mg/kg	0.00	0.00		26.4-144				20
Benzene	0.0892	0.0050	"	0.100	0.00	89.2	42.9-137				17.9
Toluene	0.0886	0.0050	"	0.100	0.00	88.6	42.6-130				11.9
Ethylbenzene	0.0953	0.0050	"	0.100	0.00	95.3	39-133				20
m,p-Xylene	0.184	0.010	"	0.200	0.00	92.0	34.7-134				20
o-Xylene	0.0927	0.0050	"	0.100	0.00	92.7	41.3-126				20
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0458</i>		<i>"</i>	<i>0.0400</i>		<i>115</i>	<i>67.4-143</i>				
<i>Surrogate: Toluene-d8</i>	<i>0.0386</i>		<i>"</i>	<i>0.0400</i>		<i>96.6</i>	<i>77.3-114</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0400</i>		<i>"</i>	<i>0.0400</i>		<i>99.9</i>	<i>78.4-125</i>				

Matrix Spike Dup (1112303-MSD1)	Source: R111162-01			Prepared & Analyzed: 11/23/11							
Naphthalene	ND	0.0050	mg/kg	0.00	0.00		26.4-144				20
Benzene	0.0874	0.0050	"	0.100	0.00	87.4	42.9-137	1.94			17.9
Toluene	0.0902	0.0050	"	0.100	0.00	90.2	42.6-130	1.71			11.9
Ethylbenzene	0.0946	0.0050	"	0.100	0.00	94.6	39-133	0.695			20
m,p-Xylene	0.183	0.010	"	0.200	0.00	91.7	34.7-134	0.343			20
o-Xylene	0.0922	0.0050	"	0.100	0.00	92.2	41.3-126	0.519			20
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0438</i>		<i>"</i>	<i>0.0400</i>		<i>110</i>	<i>67.4-143</i>				
<i>Surrogate: Toluene-d8</i>	<i>0.0392</i>		<i>"</i>	<i>0.0400</i>		<i>98.0</i>	<i>77.3-114</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0397</i>		<i>"</i>	<i>0.0400</i>		<i>99.3</i>	<i>78.4-125</i>				

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Project: PDC - Zimmerman 11D, 12, 21D, 22-17U, 17ADU

Project Number: 0188
Project Manager: Brian Dodek

Reported:
11/24/11 07:03

Notes and Definitions

E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.

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

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