

IMAGE COURTESY OF ESRI/USGS

# LEGEND

○ SITE LOCATION

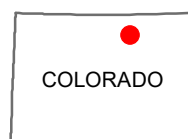
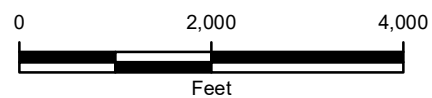


FIGURE 1  
SITE LOCATION MAP  
DOW 23-28  
NESW SEC 28-T5N-R63W  
WELD COUNTY, COLORADO  
BONANZA CREEK ENERGY, INC.





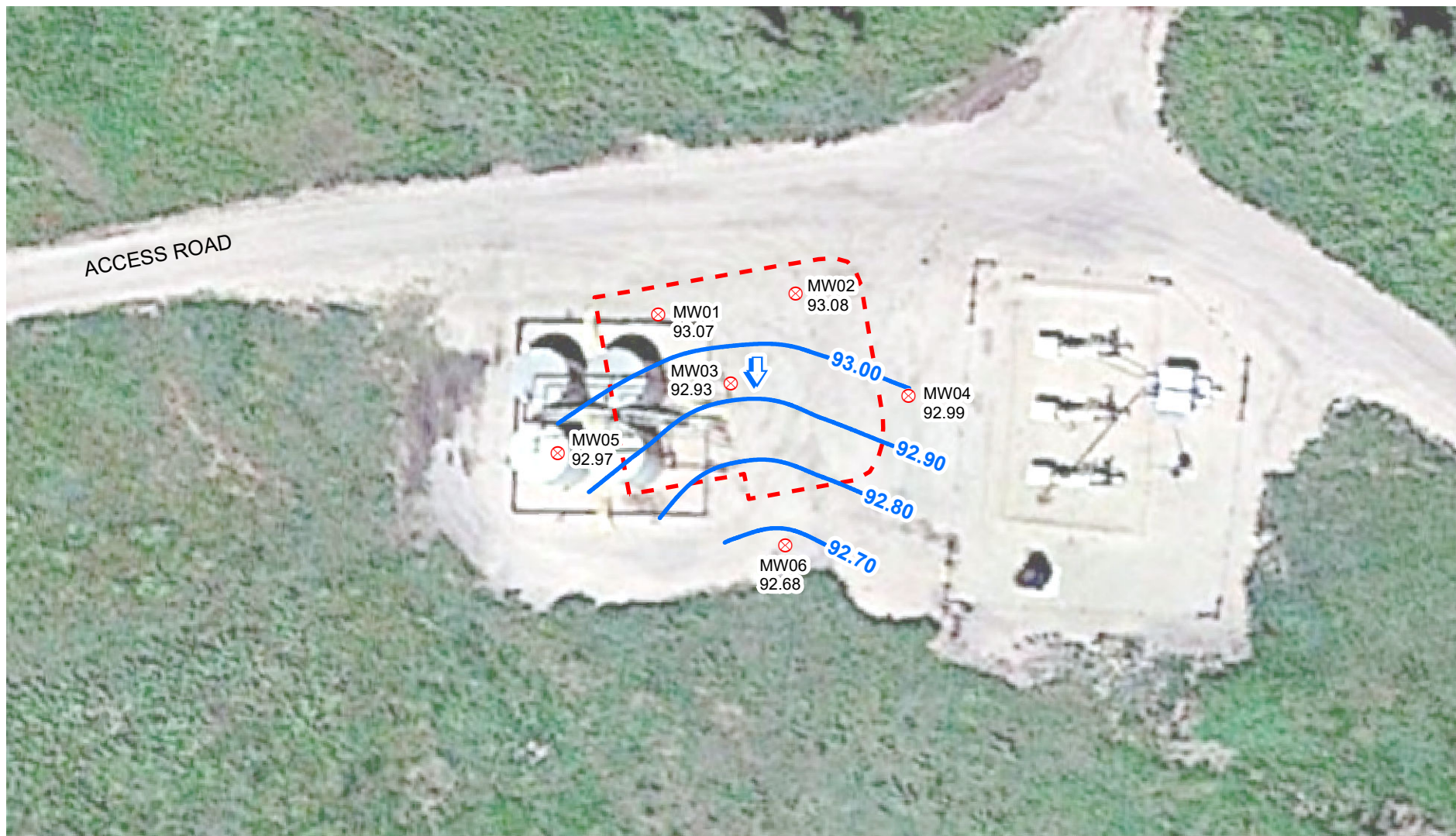


IMAGE COURTESY OF GOOGLE EARTH 2016

# LEGEND

⊗ MONITORING WELL

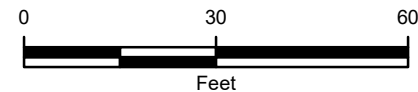
--- EXCAVATION EXTENT

↑ CALCULATED GROUNDWATER FLOW DIRECTION

— RELATIVE GROUNDWATER ELEVATION CONTOUR

CONTOUR INTERVAL = 0.10 FEET

GRADIENT = 0.007 FEET/FOOT



**FIGURE 2**  
**RELATIVE GROUNDWATER ELEVATION MAP**  
 DOW 23-28  
 NESW SEC 28-T5N-R63W  
 WELD COUNTY, COLORADO  
**BONANZA CREEK ENERGY, INC.**



GROUNDWATER ELEVATIONS WERE  
 MEASURED ON APRIL 1, 2019.





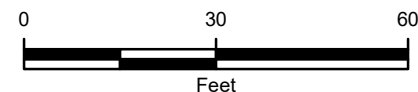
IMAGE COURTESY OF GOOGLE EARTH 2016

## LEGEND

⊗ MONITORING WELL

↑ CALCULATED GROUNDWATER FLOW DIRECTION

- - - EXCAVATION EXTENT



**FIGURE 3**  
**GROUNDWATER ANALYTICAL RESULTS**  
**DOW 23-28**  
**NESW SEC 28-T5N-R63W**  
**WELD COUNTY, COLORADO**  
**BONANZA CREEK ENERGY, INC.**



**TABLE 1**  
**GROUNDWATER ANALYTICAL RESULTS**

**DOW 23-28**  
**WELD COUNTY, COLORADO**  
**BONANZA CREEK ENERGY, INC.**

Sample ID	Sample Date	Depth to Groundwater (feet bgs)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW01	7/27/2018	5.26	93.16	<1.00	<1.00	<1.00	<1.00
	10/26/2018	5.36	93.06	<1.00	<1.00	<1.00	<1.00
	1/8/2019	5.88	92.54	<1.00	<1.00	<1.00	<1.00
	4/1/2019	5.35	93.07	<1.00	<1.00	<1.00	<1.00
MW02	7/27/2018	5.32	93.17	<1.00	<1.00	<1.00	<1.00
	10/26/2018	5.41	93.08	<1.00	<1.00	<1.00	<1.00
	1/8/2019	5.95	92.54	<1.00	<1.00	<1.00	<1.00
	4/1/2019	5.41	93.08	<1.00	<1.00	<1.00	<1.00
MW03	7/27/2018	5.04	93.02	<1.00	<1.00	<1.00	<1.00
	10/26/2018	5.14	92.92	<1.00	<1.00	<1.00	<1.00
	1/8/2019	5.66	92.40	<1.00	<1.00	<1.00	<1.00
	4/1/2019	5.13	92.93	<1.00	<1.00	<1.00	<1.00
MW04	7/27/2018	5.24	93.12	<1.00	<1.00	<1.00	<1.00
	10/26/2018	5.37	92.99	<1.00	<1.00	<1.00	<1.00
	1/8/2019	5.91	92.45	<1.00	<1.00	<1.00	<1.00
	4/1/2019	5.37	92.99	<1.00	<1.00	<1.00	<1.00
MW05	7/27/2018	4.97	93.06	<1.00	<1.00	<1.00	<1.00
	10/26/2018	5.07	92.96	<1.00	<1.00	<1.00	<1.00
	1/8/2019	5.58	92.45	<1.00	<1.00	<1.00	<1.00
	4/1/2019	5.06	92.97	<1.00	<1.00	<1.00	<1.00
MW06	7/27/2018	5.06	92.77	<1.00	<1.00	<1.00	<1.00
	10/26/2018	5.16	92.67	<1.00	<1.00	<1.00	<1.00
	1/8/2019	5.68	92.15	<1.00	<1.00	<1.00	<1.00
	4/1/2019	5.15	92.68	<1.00	<1.00	<1.00	<1.00
<b>COGCC Table 910-1 Concentration Level</b>				<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>

Notes:

bgs - below ground surface

µg/L - micrograms per liter

< - Less than laboratory reporting limit.

COGCC - Colorado Oil and Gas Conservation Commission

**Bold** indicates result exceeds the applicable COGCC Table 910-1 Concentration Level





April 08, 2019

LT Environmental, Inc.

Jeremy Pike

4600 West 60th Avenue

Arvada

CO 80003

**Project Name - Dow 23-28**

**Project Number - 034517003**

Attached are your analytical results for Dow 23-28 received by Origins Laboratory, Inc. April 01, 2019. This project is associated with Origins project number Y904029-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

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

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	Y904029-01	Water	April 1, 2019 12:47	04/01/2019 16:18
MW02	Y904029-02	Water	April 1, 2019 12:37	04/01/2019 16:18
MW03	Y904029-03	Water	April 1, 2019 12:57	04/01/2019 16:18
MW04	Y904029-04	Water	April 1, 2019 12:27	04/01/2019 16:18
MW05	Y904029-05	Water	April 1, 2019 12:07	04/01/2019 16:18
MW06	Y904029-06	Water	April 1, 2019 12:17	04/01/2019 16:18

Origins Laboratory, Inc.



*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.*

Jen Pellegrini For Noelle Doyle Mathis, President



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

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

www.originslaboratory.com

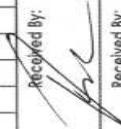
page 1 of 1

1904029

ORIGINS LABORATORY, INC

Client: LT Environmental, Inc.  
Address: 4600 West 60th Ave, Arvada, CO  
Telephone Number: 303-433-9788  
Email Address: jpike@ltenv.com, croy@ltenv.com

Project Manager: Jeremy Pike  
Project Name: Dow 23-28  
Project Number: 034517003  
Samples Collected By: Drew Sullivan

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative					Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa #	Other		
MW01	4/1/19	12:47	3	X				X				BTEX	1
MW02	4/1/19	12:37	3	X				X				BTEX	2
MW03	4/1/19	12:51	3	X				X				BTEX	3
MW04	4/1/19	12:27	3	X				X				BTEX	4
MW05	4/1/19	12:07	3	X				X				BTEX	5
MW06	4/1/19	12:17	3	X				X				BTEX	6
													7
													8
													9
													10
Relinquished By: <i>Drew Sullivan</i>	Date: 4/1/19	Time: 16:10						Received By: 	Date: 4-1-19	Time: 16:08	Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input checked="" type="checkbox"/> Standard <input type="checkbox"/>		
Relinquished By:	Date:	Time:						Received By:	Date:	Time:			

2.6 Date Results Needed

Origins Laboratory, Inc.

*Jefe Pellegrini*

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.





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

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

MW01

4/1/2019 12:47:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.  
Y904029-01 (Water)

BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B9D0403	JTD	04/04/2019	04/04/2019	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	98.1 %	84-121	"	"	"
Surrogate: Toluene-d8	101 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	97.7 %	84-114	"	"	"

Origins Laboratory, Inc.



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

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

**MW02****4/1/2019 12:37:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y904029-02 (Water)****BTEX by EPA 8260C**

Benzene	ND	1.00	ug/L	1	B9D0403	JTD	04/04/2019	04/04/2019	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	100 %	84-121	"	"	"
Surrogate: Toluene-d8	101 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	98.8 %	84-114	"	"	"

Origins Laboratory, Inc.



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

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

**MW03**

**4/1/2019 12:57:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y904029-03 (Water)**

**BTEX by EPA 8260C**

Benzene	ND	1.00	ug/L	1	B9D0403	JTD	04/04/2019	04/04/2019	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	102 %	84-121	"	"	"
Surrogate: Toluene-d8	102 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	98.8 %	84-114	"	"	"

Origins Laboratory, Inc.



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

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

## MW04

4/1/2019 12:27:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y904029-04 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B9D0403	JTD	04/04/2019	04/04/2019	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121	"	"	"
Surrogate: Toluene-d8	102 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	99.2 %	84-114	"	"	"

Origins Laboratory, Inc.



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

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

## MW05

4/1/2019 12:07:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y904029-05 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B9D0403	JTD	04/04/2019	04/04/2019	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121	"	"	"
Surrogate: Toluene-d8	104 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	100 %	84-114	"	"	"

Origins Laboratory, Inc.



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4600 West 60th Avenue  
Arvada CO 80003

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

## MW06

4/1/2019 12:17:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y904029-06 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B9D0403	JTD	04/04/2019	04/04/2019	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	102 %	84-121	"	"	"
Surrogate: Toluene-d8	103 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	97.7 %	84-114	"	"	"

Origins Laboratory, Inc.



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

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9D0403 - EPA 5030B (Water)**

**Blank (B9D0403-BLK1)**

Prepared: 04/04/2019 Analyzed: 04/04/2019

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5	98.0	84-121				
Surrogate: Toluene-d8	63		"	62.5	101	85-115				
Surrogate: 4-Bromofluorobenzene	60		"	62.5	96.0	84-114				

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

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

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9D0403 - EPA 5030B (Water)**

**LCS (B9D0403-BS1)**

Prepared: 04/04/2019 Analyzed: 04/04/2019

Benzene	50.7	1.00	ug/L	50.0	101	73.3-129
Toluene	47.6	1.00	"	50.0	95.2	76.2-123
Ethylbenzene	45.9	1.00	"	50.0	91.9	73.6-130
m,p-Xylene	93.2	2.00	"	100	93.2	76.1-126
o-Xylene	46.9	1.00	"	50.0	93.7	76.6-124
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5	94.5	84-121
Surrogate: Toluene-d8	63		"	62.5	102	85-115
Surrogate: 4-Bromofluorobenzene	63		"	62.5	100	84-114

Origins Laboratory, Inc.



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4600 West 60th Avenue  
Arvada CO 80003

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

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

**Batch B9D0403 - EPA 5030B (Water)**

Matrix Spike (B9D0403-MS1)		Source: Y904020-04			Prepared: 04/04/2019 Analyzed: 04/04/2019					
Benzene	56.1	1.00	ug/L	50.0	1.82	109	74-130			
Toluene	51.8	1.00	"	50.0	ND	104	73-131			
Ethylbenzene	51.7	1.00	"	50.0	ND	103	76-132			
m,p-Xylene	104	2.00	"	100	ND	104	69-139			
o-Xylene	50.7	1.00	"	50.0	ND	101	74-131			
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		93.9	84-121			
Surrogate: Toluene-d8	63		"	62.5		101	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.1	84-114			

Origins Laboratory, Inc.



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4600 West 60th Avenue  
Arvada CO 80003

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

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

**Batch B9D0403 - EPA 5030B (Water)**

Matrix Spike Dup (B9D0403-MSD1)		Source: Y904020-04			Prepared: 04/04/2019 Analyzed: 04/04/2019					
Benzene	57.4	1.00	ug/L	50.0	1.82	111	74-130	2.24	20	
Toluene	49.8	1.00	"	50.0	ND	99.5	73-131	4.04	20	
Ethylbenzene	48.4	1.00	"	50.0	ND	96.8	76-132	6.63	20	
m,p-Xylene	96.5	2.00	"	100	ND	96.5	69-139	7.50	20	
o-Xylene	48.6	1.00	"	50.0	ND	97.2	74-131	4.17	20	
Surrogate: 1,2-Dichloroethane-d4	58		"	62.5		93.4	84-121			
Surrogate: Toluene-d8	64		"	62.5		102	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	84-114			

Origins Laboratory, Inc.



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4600 West 60th Avenue  
Arvada CO 80003

Jeremy Pike  
Project Number: 034517003  
Project: Dow 23-28

### Notes and Definitions

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President