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*Automated Report*

## Technical Report for

### Central Operating

Marick Lease

SGS Job Number: DA8779

Sampling Date: 09/04/18

#### Report to:

Central Operating  
1600 Broadway #1050  
Denver, CO

ATTN: Conner Staley

Total number of pages in report: 35



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in black ink, appearing to read 'Scott Heideman'.

**Scott Heideman**  
Laboratory Director

**Client Service contact: Carissa Cumine 303-425-6021**

Certifications: CO (CO00049), ID (CO00049), NE (NE-OS-06-04), ND (R-027), NJ (CO007), OK (D9942)  
UT (NELAP CO00049), LA (LA150028), TX (T104704511), WY (8TMS-L)

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Test results relate only to samples analyzed.

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## Sample Summary

Central Operating

Job No: DA8779

Marick Lease

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
DA8779-1	09/04/18	13:45	CJS	09/04/18	SO Soil	NORTH WALL
DA8779-2	09/04/18	13:45	CJS	09/04/18	SO Soil	EAST WALL
DA8779-3	09/04/18	13:45	CJS	09/04/18	SO Soil	SOUTH WALL
DA8779-4	09/04/18	13:45	CJS	09/04/18	SO Soil	BASE

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Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## Summary of Hits

Job Number: DA8779  
Account: Central Operating  
Project: Marick Lease  
Collected: 09/04/18

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
DA8779-1	NORTH WALL					
TPH-DRO (C10-C28)		55.4	11	9.5	mg/kg	SW846-8015B
DA8779-2	EAST WALL					
TPH-DRO (C10-C28)		12.3	10	9.4	mg/kg	SW846-8015B
DA8779-3	SOUTH WALL					
No hits reported in this sample.						
DA8779-4	BASE					
TPH-DRO (C10-C28)		526	110	100	mg/kg	SW846-8015B

### Sample Results

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### Report of Analysis

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## Report of Analysis

<b>Client Sample ID:</b> NORTH WALL	
<b>Lab Sample ID:</b> DA8779-1	<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 09/04/18
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> 94.5
<b>Project:</b> Marick Lease	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V6182.D	1	09/06/18 22:24	GO	n/a	n/a	V6V1889
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.05 g	5.0 ml
Run #2		

### Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.52	ug/kg	
108-88-3	Toluene	ND	2.1	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	2.1	0.52	ug/kg	
1330-20-7	Xylene (total)	ND	2.1	1.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		70-131%
2037-26-5	Toluene-D8	89%		70-130%
460-00-4	4-Bromofluorobenzene	95%		70-130%
17060-07-0	1,2-Dichloroethane-D4	103%		70-130%

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.1  
3

<b>Client Sample ID:</b> NORTH WALL <b>Lab Sample ID:</b> DA8779-1 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8015B <b>Project:</b> Marick Lease	<b>Date Sampled:</b> 09/04/18 <b>Date Received:</b> 09/04/18 <b>Percent Solids:</b> 94.5
---	--

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA45214.D	1	09/07/18 02:50	BB	n/a	n/a	GGA2114
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	11	5.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	111%		60-140%		

---

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.1  
3

<b>Client Sample ID:</b> NORTH WALL	
<b>Lab Sample ID:</b> DA8779-1	<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 09/04/18
<b>Method:</b> SW846-8015B SW846 3546	<b>Percent Solids:</b> 94.5
<b>Project:</b> Marick Lease	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH044577.D	1	09/14/18 15:08	RB	09/12/18	OP16868	GFH1901
Run #2							

	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	55.4	11	9.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	78%		41-134%		

---

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

32  
3

<b>Client Sample ID:</b> EAST WALL	
<b>Lab Sample ID:</b> DA8779-2	<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 09/04/18
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> 95.1
<b>Project:</b> Marick Lease	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V6183.D	1	09/06/18 22:48	GO	n/a	n/a	V6V1889
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.02 g	5.0 ml
Run #2		

### Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.52	ug/kg	
108-88-3	Toluene	ND	2.1	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	2.1	0.52	ug/kg	
1330-20-7	Xylene (total)	ND	2.1	1.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-131%
2037-26-5	Toluene-D8	91%		70-130%
460-00-4	4-Bromofluorobenzene	92%		70-130%
17060-07-0	1,2-Dichloroethane-D4	101%		70-130%

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

32  
3

<b>Client Sample ID:</b> EAST WALL	
<b>Lab Sample ID:</b> DA8779-2	<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 09/04/18
<b>Method:</b> SW846 8015B	<b>Percent Solids:</b> 95.1
<b>Project:</b> Marick Lease	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA45215.D	1	09/07/18 03:26	BB	n/a	n/a	GGA2114
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	11	5.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	111%		60-140%		

---

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

32  
3

<b>Client Sample ID:</b> EAST WALL <b>Lab Sample ID:</b> DA8779-2 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846-8015B SW846 3546 <b>Project:</b> Marick Lease	<b>Date Sampled:</b> 09/04/18 <b>Date Received:</b> 09/04/18 <b>Percent Solids:</b> 95.1
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	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH044581.D	1	09/14/18 15:52	RB	09/12/18	OP16868	GFH1901
Run #2							

	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	12.3	10	9.4	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	80%		41-134%		

---

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range	MDL = Method Detection Limit J = Indicates an estimated value B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound
--	--

## Report of Analysis

<b>Client Sample ID:</b> SOUTH WALL	
<b>Lab Sample ID:</b> DA8779-3	<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 09/04/18
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> 92.8
<b>Project:</b> Marick Lease	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V6184.D	1	09/06/18 23:12	GO	n/a	n/a	V6V1889
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.08 g	5.0 ml
Run #2		

### Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.1	0.53	ug/kg	
108-88-3	Toluene	ND	2.1	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	2.1	0.53	ug/kg	
1330-20-7	Xylene (total)	ND	2.1	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		70-131%
2037-26-5	Toluene-D8	90%		70-130%
460-00-4	4-Bromofluorobenzene	94%		70-130%
17060-07-0	1,2-Dichloroethane-D4	104%		70-130%

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> SOUTH WALL	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> DA8779-3	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 92.8
<b>Method:</b> SW846 8015B	
<b>Project:</b> Marick Lease	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA45216.D	1	09/07/18 04:01	BB	n/a	n/a	GGA2114
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	12	5.8	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	109%		60-140%		

---

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> SOUTH WALL	
<b>Lab Sample ID:</b> DA8779-3	<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 09/04/18
<b>Method:</b> SW846-8015B SW846 3546	<b>Percent Solids:</b> 92.8
<b>Project:</b> Marick Lease	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH044583.D	1	09/14/18 16:14	RB	09/12/18	OP16868	GFH1901
Run #2							

	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	11	9.7	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	78%		41-134%		

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

3.4  
3

<b>Client Sample ID:</b> BASE <b>Lab Sample ID:</b> DA8779-4 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8260B <b>Project:</b> Marick Lease	<b>Date Sampled:</b> 09/04/18 <b>Date Received:</b> 09/04/18 <b>Percent Solids:</b> 86.7
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V6185.D	1	09/06/18 23:36	GO	n/a	n/a	V6V1889
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.00 g	5.0 ml
Run #2		

### Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.2	0.58	ug/kg	
108-88-3	Toluene	ND	2.3	1.2	ug/kg	
100-41-4	Ethylbenzene	ND	2.3	0.58	ug/kg	
1330-20-7	Xylene (total)	ND	2.3	1.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		70-131%
2037-26-5	Toluene-D8	91%		70-130%
460-00-4	4-Bromofluorobenzene	91%		70-130%
17060-07-0	1,2-Dichloroethane-D4	102%		70-130%

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ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.4  
3

<b>Client Sample ID:</b> BASE		
<b>Lab Sample ID:</b> DA8779-4		<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> SO - Soil		<b>Date Received:</b> 09/04/18
<b>Method:</b> SW846 8015B		<b>Percent Solids:</b> 86.7
<b>Project:</b> Marick Lease		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA45217.D	1	09/07/18 04:37	BB	n/a	n/a	GGA2114
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	13	6.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	90%		60-140%		

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.4  
3

<b>Client Sample ID:</b> BASE	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> DA8779-4	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.7
<b>Method:</b> SW846-8015B SW846 3546	
<b>Project:</b> Marick Lease	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH044585.D	10	09/14/18 16:36	RB	09/12/18	OP16868	GFH1901
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	526	110	100	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	92%		41-134%		

---

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

**Misc. Forms**

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**Custody Documents and Other Forms**

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**Includes the following where applicable:**

- Chain of Custody



# SGS Accutest Sample Receipt Summary

Job Number: DA8779

Client: CENTRAL OPERATING

Project: MARICK LEASE

Date / Time Received: 9/4/2018 5:10:00 PM

Delivery Method: \_\_\_\_\_

Airbill #'s: HD

Cooler Temps (Initial/Adjusted): #1: (4.2/4.2):

**Cooler Security**

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Cooler Temperature**

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | <u>IR Gun;</u>                      |                          |
| 3. Cooler media:             | <u>Ice (Bag)</u>                    |                          |
| 4. No. Coolers:              | <u>1</u>                            |                          |

**Quality Control Preservation**

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Sample Integrity - Documentation**

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Sample Integrity - Condition**

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | <u>Intact</u>                       |                          |

**Sample Integrity - Instructions**

Y or N

N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Comments

DA8779: Chain of Custody

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4.1  
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## MS Volatiles

### QC Data Summaries

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**Includes the following where applicable:**

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Job Number: DA8779  
Account: CENOCOD Central Operating  
Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V1889-MB	6V6176.D	1	09/06/18	GO	n/a	n/a	V6V1889

The QC reported here applies to the following samples:

Method: SW846 8260B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	25	ug/kg	
100-41-4	Ethylbenzene	ND	100	25	ug/kg	
108-88-3	Toluene	ND	100	50	ug/kg	
1330-20-7	Xylene (total)	ND	100	50	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	91% 70-131%
2037-26-5	Toluene-D8	91% 70-130%
460-00-4	4-Bromofluorobenzene	92% 70-130%
17060-07-0	1,2-Dichloroethane-D4	97% 70-130%

## Method Blank Summary

Job Number: DA8779  
Account: CENOCOD Central Operating  
Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V1889-MB	6V6177.D	1	09/06/18	GO	n/a	n/a	V6V1889

The QC reported here applies to the following samples:

Method: SW846 8260B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.50	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.50	ug/kg	
108-88-3	Toluene	ND	2.0	1.0	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	1.0	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	94% 70-131%
2037-26-5	Toluene-D8	92% 70-130%
460-00-4	4-Bromofluorobenzene	94% 70-130%
17060-07-0	1,2-Dichloroethane-D4	101% 70-130%

# Blank Spike Summary

Job Number: DA8779  
 Account: CENOCOD Central Operating  
 Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V1889-BS	6V6173.D	1	09/06/18	GO	n/a	n/a	V6V1889

The QC reported here applies to the following samples:

Method: SW846 8260B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	49.9	100	68-130
100-41-4	Ethylbenzene	50	46.0	92	69-130
108-88-3	Toluene	50	45.0	90	65-130
1330-20-7	Xylene (total)	150	139	93	69-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	97%	70-131%
2037-26-5	Toluene-D8	90%	70-130%
460-00-4	4-Bromofluorobenzene	97%	70-130%
17060-07-0	1,2-Dichloroethane-D4	98%	70-130%

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: DA8779  
 Account: CENOCOD Central Operating  
 Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V1889-BS	6V6175.D	1	09/06/18	GO	n/a	n/a	V6V1889

The QC reported here applies to the following samples:

Method: SW846 8260B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
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CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	93%	70-131%
2037-26-5	Toluene-D8	92%	70-130%
460-00-4	4-Bromofluorobenzene	96%	70-130%
17060-07-0	1,2-Dichloroethane-D4	91%	70-130%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA8779  
 Account: CENOCOD Central Operating  
 Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA8592-5MS	6V6178.D	1	09/06/18	GO	n/a	n/a	V6V1889
DA8592-5MSD	6V6179.D	1	09/06/18	GO	n/a	n/a	V6V1889
DA8592-5	6V6189.D	1	09/07/18	GO	n/a	n/a	V6V1889

The QC reported here applies to the following samples:

Method: SW846 8260B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	DA8592-5 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	49.5	27.1	55	49.2	34.0	69	23	48-130/30
100-41-4	Ethylbenzene	ND	49.5	14.7	30	49.2	16.1	33	9	25-144/30
108-88-3	Toluene	ND	49.5	19.2	39	49.2	22.3	45	15	34-130/30
1330-20-7	Xylene (total)	ND	149	42.4	29	148	45.5	31	7	24-143/30

CAS No.	Surrogate Recoveries	MS	MSD	DA8592-5	Limits
1868-53-7	Dibromofluoromethane	100%	96%	103%	70-131%
2037-26-5	Toluene-D8	89%	90%	95%	70-130%
460-00-4	4-Bromofluorobenzene	98%	96%	97%	70-130%
17060-07-0	1,2-Dichloroethane-D4	102%	105%	100%	70-130%

\* = Outside of Control Limits.

5.3.1  
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# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA8779  
 Account: CENOCOD Central Operating  
 Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA8592-5MS	6V6180.D	1	09/06/18	GO	n/a	n/a	V6V1889
DA8592-5MSD	6V6181.D	1	09/06/18	GO	n/a	n/a	V6V1889
DA8592-5	6V6189.D	1	09/07/18	GO	n/a	n/a	V6V1889

The QC reported here applies to the following samples:

Method: SW846 8260B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	DA8592-5 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
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CAS No.	Surrogate Recoveries	MS	MSD	DA8592-5	Limits
1868-53-7	Dibromofluoromethane	100%	96%	103%	70-131%
2037-26-5	Toluene-D8	93%	91%	95%	70-130%
460-00-4	4-Bromofluorobenzene	101%	99%	97%	70-130%
17060-07-0	1,2-Dichloroethane-D4	110%	109%	100%	70-130%

\* = Outside of Control Limits.

5.3.2  
5

## GC Volatiles

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## QC Data Summaries

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**Includes the following where applicable:**

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Method Blank Summary

Job Number: DA8779  
Account: CENOCOD Central Operating  
Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA2114-MB	GA45191.D	1	09/06/18	BB	n/a	n/a	GGA2114

The QC reported here applies to the following samples:

Method: SW846 8015B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	10	5.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	108% 60-140%

# Blank Spike Summary

Job Number: DA8779  
Account: CENOCOD Central Operating  
Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA2114-BS	GA45192.D	1	09/06/18	BB	n/a	n/a	GGA2114

The QC reported here applies to the following samples:

Method: SW846 8015B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	92.4	84	54-139

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	113%	60-140%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA8779  
 Account: CENOCOD Central Operating  
 Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA8705-2MS	GA45194.D	1	09/06/18	BB	n/a	n/a	GGA2114
DA8705-2MSD	GA45195.D	1	09/06/18	BB	n/a	n/a	GGA2114
DA8705-2 <sup>a</sup>	GA45193.D	1	09/06/18	BB	n/a	n/a	GGA2114

The QC reported here applies to the following samples:

Method: SW846 8015B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	DA8705-2 mg/kg	Spike Q	mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	9.19	J	112	94.7	76	112	94.0	75	1	36-145/30

CAS No.	Surrogate Recoveries	MS	MSD	DA8705-2	Limits
120-82-1	1,2,4-Trichlorobenzene	153%* b	165%* b	143%* b	60-140%

- (a) Sample analyzed beyond recommended hold time.
- (b) Outside control limits due to possible matrix interference.

\* = Outside of Control Limits.

## GC/LC Semi-volatiles

### QC Data Summaries

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**Includes the following where applicable:**

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Method Blank Summary

Job Number: DA8779  
Account: CENOCOD Central Operating  
Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP16868-MB	FH044525.D	1	09/13/18	RB	09/12/18	OP16868	GFH1899

The QC reported here applies to the following samples:

Method: SW846-8015B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	10	9.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	91% 41-134%

7.1.1

7

# Blank Spike Summary

Job Number: DA8779  
 Account: CENOCOD Central Operating  
 Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP16868-BS	FH044559.D	1	09/14/18	RB	09/12/18	OP16868	GFH1901

The QC reported here applies to the following samples:

Method: SW846-8015B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	250	242	97	35-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	96%	41-134%

\* = Outside of Control Limits.

7.2.1  
7

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA8779  
 Account: CENOCOD Central Operating  
 Project: Marick Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP16868-MS	FH044561.D	1	09/14/18	RB	09/12/18	OP16868	GFH1901
OP16868-MSD	FH044563.D	1	09/14/18	RB	09/12/18	OP16868	GFH1901
DA8780-1	FH044589.D	1	09/14/18	RB	09/12/18	OP16868	GFH1901

The QC reported here applies to the following samples:

Method: SW846-8015B

DA8779-1, DA8779-2, DA8779-3, DA8779-4

CAS No.	Compound	DA8780-1 mg/kg	Spike Q mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	268	200	75	267	218	82	9	10-171/30

CAS No.	Surrogate Recoveries	MS	MSD	DA8780-1	Limits
84-15-1	o-Terphenyl	79%	86%	74%	41-134%

\* = Outside of Control Limits.

7.3.1  
7