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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.

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
Marick Lease

Job No: DA8779

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

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 Analyte	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

Report of Analysis

Report of Analysis

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

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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

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
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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

Run #	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							

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)	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
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	EAST WALL	Date Sampled:	09/04/18
Lab Sample ID:	DA8779-2	Date Received:	09/04/18
Matrix:	SO - Soil	Percent Solids:	95.1
Method:	SW846 8015B		
Project:	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
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EAST WALL	Date Sampled:	09/04/18
Lab Sample ID:	DA8779-2	Date Received:	09/04/18
Matrix:	SO - Soil	Percent Solids:	95.1
Method:	SW846-8015B SW846 3546		
Project:	Marick Lease		

Run #	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							

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)	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 MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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

	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							

	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
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BASE	Date Sampled:	09/04/18
Lab Sample ID:	DA8779-4	Date Received:	09/04/18
Matrix:	SO - Soil	Percent Solids:	86.7
Method:	SW846 8260B		
Project:	Marick Lease		

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%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	BASE	Date Sampled:	09/04/18
Lab Sample ID:	DA8779-4	Date Received:	09/04/18
Matrix:	SO - Soil	Percent Solids:	86.7
Method:	SW846 8015B		
Project:	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
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

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

	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							

	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
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms**Custody Documents and Other Forms**

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

Page of

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL: 303-425-6021 FAX: 303-425-6854
www.accutest.com

Bottle Order Control #

FED-EX Tracking #

SGS Quote #

	SGS Job #
--	-----------

DA8770

[illegible]

DA8779: Chain of Custody

Page 1 of 2

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: | IR Gun; | |
| 3. Cooler media: | Ice (Bag) | |
| 4. No. Coolers: | 1 | |

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: | Intact | |

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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MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Page 1 of 1

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

Page 1 of 1

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

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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.

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.

GC Volatiles**QC Data Summaries**

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

Page 1 of 1

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 ^a	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	Q	Spike 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%

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.

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	Q	Spike 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.