

Revised Laboratory Analytical Report



ENVIRONMENTAL
TESTING, INC.

4619 N. Santa Fe
Oklahoma City, OK 73118
405.488.2400 Phone
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www.etilab.com

17 May 2018

Mr. Kyle Bennett

CTEH, LLC

5120 North Shore Drive
North Little Rock, AR 72118

WO: E8E0308

RE: 110325

Enclosed are the results of analyses for samples received by the laboratory on 5/15/2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Keith Hopcus For Russell Britten
President

Revised



CTEH, LLC 5120 North Shore Drive North Little Rock AR, 72118	Project: 110325 Project Number: 110325 Project Manager: Mr. Kyle Bennett	Reported: 05/17/18 12:35
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EDOK0512PS001
E8E0308-06 (Oil) - Sampled: 05/12/18 10:03

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Qualifiers
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Environmental Testing, Inc.

Petroleum Hydrocarbons by TNRCC 1005

TPH (C6 to C12)	417000	20000	mg/Kg	400	EGE0318	DMB	05/16/18 00:16	TNRCC 1005	
TPH (>C12 to C28)	256000	20000	mg/Kg	400	EGE0318	DMB	05/16/18 00:16	TNRCC 1005	
TPH (>C28 to C35)	69200	20000	mg/Kg	400	EGE0318	DMB	05/16/18 00:16	TNRCC 1005	
TPH (C6 to C35)	742000	60000	mg/Kg	400	EGE0318	DMB	05/16/18 00:16	TNRCC 1005	
Surrogate: Chlorooctane		%		70-130	EGE0318	DMB	05/16/18 00:16	TNRCC 1005	S-03
Surrogate: Chlorooctadecane		%		70-130	EGE0318	DMB	05/16/18 00:16	TNRCC 1005	S-03
TPH 1005 Extraction	Completed		N/A		EGE0318	VAH	05/16/18 10:00	TNRCC 1005	

Volatile Organic Compounds by EPA Method 8260

Dichlorodifluoromethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Chloromethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Vinyl chloride	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Bromomethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Chloroethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Trichlorofluoromethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Acrolein	<20000	20000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,1-Dichloroethene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Acetone	<20000	20000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Iodomethane	<15000	15000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Carbon disulfide	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Methylene chloride	<20000	20000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Acrylonitrile	<20000	20000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Methyl tert-butyl ether (MTBE)	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
trans-1,2-Dichloroethene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Vinyl acetate	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,1-Dichloroethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
2-Butanone (MEK)	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
cis-1,2-Dichloroethene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
2,2-Dichloropropane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Bromochloromethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Chloroform	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,1,1-Trichloroethane	5980	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,1-Dichloropropene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Carbon tetrachloride	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Benzene	466000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,2-Dichloroethane	10200	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Trichloroethene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,2-Dichloropropane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Dibromomethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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CTEH, LLC
5120 North Shore Drive
North Little Rock AR, 72118

Project: 110325
Project Number: 110325
Project Manager: Mr. Kyle Bennett

Reported:
05/17/18 12:35

EDOK0512PS001

E8E0308-06 (Oil) - Sampled: 05/12/18 10:03

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Qualifiers
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Environmental Testing, Inc.

Volatile Organic Compounds by EPA Method 8260

Bromodichloromethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
2-Chloroethylvinyl ether	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
cis-1,3-Dichloropropene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
4-Methyl-2-pentanone (MIBK)	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Toluene	1520000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	E
trans-1,3-Dichloropropene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,1,2-Trichloroethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Tetrachloroethene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
2-Hexanone	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,3-Dichloropropane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Dibromochloromethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Chlorobenzene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,2-Dibromoethane (EDB)	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Ethylbenzene	280000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,1,1,2-Tetrachloroethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
m+p-Xylene	1580000	10000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	E
o-Xylene	525000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	E
Styrene	13900	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Bromoform	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Isopropylbenzene	65100	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,1,2,2-Tetrachloroethane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
trans-1,4-Dichloro-2-butene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,2,3-Trichloropropane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Bromobenzene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
n-Propylbenzene	120000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
2-Chlorotoluene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,3,5-Trimethylbenzene	307000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
4-Chlorotoluene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
4-Isopropyltoluene	34000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
tert-Butylbenzene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,2,4-Trimethylbenzene	856000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	E
sec-Butylbenzene	36400	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,3-Dichlorobenzene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,4-Dichlorobenzene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
n-Butylbenzene	70200	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,2-Dichlorobenzene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,2-Dibromo-3-chloropropane	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,2,4-Trichlorobenzene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	

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E8E0308
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ETI_OKC_RPT_HOU_rev4.01.rpt



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CTEH, LLC
5120 North Shore Drive
North Little Rock AR, 72118

Project: 110325
Project Number: 110325
Project Manager: Mr. Kyle Bennett

Reported:
05/17/18 12:35

EDOK0512PS001

E8E0308-06 (Oil) - Sampled: 05/12/18 10:03

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Qualifiers
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Environmental Testing, Inc.

Volatile Organic Compounds by EPA Method 8260

Hexachlorobutadiene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
Naphthalene	34200	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
1,2,3-Trichlorobenzene	<5000	5000	ug/Kg	200	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
<i>Surrogate: Dibromofluoromethane</i>		92 %		72-128	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		93 %		72.2-138	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
<i>Surrogate: Toluene-d8</i>		128 %		68.9-135	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	
<i>Surrogate: 4-Bromofluorobenzene</i>		122 %		68.8-144	EGE0334	DMB	05/16/18 04:20	EPA 8260B 1996	

Semivolatile Organic Compounds by EPA Method 8270

n-Nitrosodimethylamine	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Pyridine	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Phenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Bis(2-chloroethyl)ether	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2-Chlorophenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
1,3-Dichlorobenzene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
1,4-Dichlorobenzene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
1,2-Dichlorobenzene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2-Methylphenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Bis(2-chloroisopropyl)ether	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
n-Nitrosodi-n-propylamine	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
4-Methylphenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Hexachloroethane	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Nitrobenzene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Isophorone	512000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2-Nitrophenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2,4-Dimethylphenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Bis(2-chloroethoxy)methane	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2,4-Dichlorophenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
1,2,4-Trichlorobenzene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Naphthalene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Hexachlorobutadiene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
4-Chloro-3-methylphenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Hexachlorocyclopentadiene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2,4,6-Trichlorophenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2,4,5-Trichlorophenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2-Chloronaphthalene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Dimethyl phthalate	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2,6-Dinitrotoluene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Acenaphthylene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	

Environmental Testing, Inc.

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E8E0308
Revised
ETI_OXC_RPT_MRL_rev4.0.rpt



CTEH, LLC 5120 North Shore Drive North Little Rock AR, 72118	Project: 110325 Project Number: 110325 Project Manager: Mr. Kyle Bennett	Reported: 05/17/18 12:35
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EDOK0512PS001
E8E0308-06 (Oil) - Sampled: 05/12/18 10:03

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Qualifiers
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Environmental Testing, Inc.

Semivolatile Organic Compounds by EPA Method 8270

Acenaphthene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2,4-Dinitrophenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
4-Nitrophenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
2,4-Dinitrotoluene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Diethyl phthalate	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Fluorene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
4-Chlorophenyl phenyl ether	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
4,6-Dinitro-2-methylphenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
n-Nitrosodiphenylamine	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
4-Bromophenyl phenyl ether	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Hexachlorobenzene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Pentachlorophenol	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Phenanthrene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Anthracene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Di-n-butyl phthalate	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Fluoranthene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Benzidine	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Pyrene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Butyl benzyl phthalate	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Benzo(a)anthracene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
3,3'-Dichlorobenzidine	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Chrysene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Bis(2-ethylhexyl)phthalate	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Di-n-octyl phthalate	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Benzo(b)fluoranthene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Benzo(k)fluoranthene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Benzo(a)pyrene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Indeno(1,2,3-cd)pyrene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Dibenz(a,h)anthracene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Benzo(g,h,i)perylene	<500000	500000	ug/Kg	1250	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Surrogate: 2-Fluorophenol		79 %		1-116	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Surrogate: Phenol-d5		79 %		19.8-107	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Surrogate: Nitrobenzene-d5		83 %		1-110	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Surrogate: 2-Fluorobiphenyl		86 %		18.3-108	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Surrogate: 2,4,6-Tribromophenol		88 %		22-122	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Surrogate: Terphenyl-d14		103 %		1-171	EGE0357	ch	05/16/18 16:12	EPA 8270D	
Waste Dilution	Completed		N/A		EGE0357	FJM	05/16/18 15:30	EPA 3580A	

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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CTEH, LLC 5120 North Shore Drive North Little Rock AR, 72118	Project: 110325 Project Number: 110325 Project Manager: Mr. Kyle Bennett	Reported: 05/17/18 12:35
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QUALITY CONTROL

Petroleum Hydrocarbons by TNRC 1005

Environmental Testing, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
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Batch EGE0318 - TPH 1005

Blank (EGE0318-BLK1)			Prepared & Analyzed: 05/15/18							
TPH (C6 to C12)	<50.0	50.0	mg/Kg							
TPH (>C12 to C28)	<50.0	50.0	mg/Kg							
TPH (>C28 to C35)	<50.0	50.0	mg/Kg							
TPH (C6 to C35)	<150	150	mg/Kg							
TPH 1005 Extraction	Completed		N/A							
Surrogate: Chlorooctane	48.7		mg/Kg	50.0		97	70-130			
Surrogate: Chlorooctadecane	50.2		mg/Kg	50.0		100	70-130			

LCS (EGE0318-BS1)			Prepared & Analyzed: 05/15/18							
TPH (C6 to C12)	512	50.0	mg/Kg	500		102	75-125			
TPH (>C12 to C28)	464	50.0	mg/Kg	500		93	75-125			
TPH 1005 Extraction	Completed		N/A							
Surrogate: Chlorooctane	48.8		mg/Kg	50.0		98	70-130			
Surrogate: Chlorooctadecane	48.2		mg/Kg	50.0		96	70-130			

LCS Dup (EGE0318-BSD1)			Prepared & Analyzed: 05/15/18							
TPH (C6 to C12)	540	50.0	mg/Kg	500		108	75-125	5	20	
TPH (>C12 to C28)	481	50.0	mg/Kg	500		96	75-125	3	20	
TPH 1005 Extraction	Completed		N/A							
Surrogate: Chlorooctane	51.4		mg/Kg	50.0		103	70-130			
Surrogate: Chlorooctadecane	50.1		mg/Kg	50.0		100	70-130			

Matrix Spike (EGE0318-MS1)			Source: E8E0308-04		Prepared & Analyzed: 05/15/18					
TPH (C6 to C12)	531	50.0	mg/Kg	500	17.3	103	75-125			
TPH (>C12 to C28)	483	50.0	mg/Kg	500	16.5	93	75-125			
TPH 1005 Extraction	Completed		N/A							
Surrogate: Chlorooctane	49.3		mg/Kg	50.0		99	70-130			
Surrogate: Chlorooctadecane	49.5		mg/Kg	50.0		99	70-130			

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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CTEH, LLC
 5120 North Shore Drive
 North Little Rock AR, 72118

Project: 110325
 Project Number: 110325
 Project Manager: Mr. Kyle Bennett

Reported:
 05/17/18 12:35

QUALITY CONTROL

Petroleum Hydrocarbons by TNRCC 1005 Environmental Testing, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
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Batch EGE0318 - TPH 1005

Matrix Spike Dup (EGE0318-MSD1)

Source: E8E0308-04

Prepared & Analyzed: 05/15/18

TPH (C6 to C12)	525	50.0	mg/Kg	500	17.3	102	75-125	1	20	
TPH (>C12 to C28)	480	50.0	mg/Kg	500	16.5	93	75-125	0.5	20	
TPH 1005 Extraction	Completed		N/A							
Surrogate: Chlorooctane	50.1		mg/Kg	50.0		100	70-130			
Surrogate: Chlorooctadecane	49.2		mg/Kg	50.0		98	70-130			

Batch EGE0348 - TPH 1005

Blank (EGE0348-BLK1)

Prepared & Analyzed: 05/16/18

TPH (C6 to C12)	<5.00	5.00	mg/L							
TPH (>C12 to C28)	<5.00	5.00	mg/L							
TPH (>C28 to C35)	<5.00	5.00	mg/L							
TPH (C6 to C35)	<15.0	15.0	mg/L							
TPH 1005 Extraction	Completed		N/A							
Surrogate: Chlorooctane	5.52		mg/L	5.00		110	70-130			
Surrogate: Chlorooctadecane	5.63		mg/L	5.00		113	70-130			

LCS (EGE0348-BS1)

Prepared & Analyzed: 05/16/18

TPH (C6 to C12)	52.2	5.00	mg/L	50.0		104	75-125			
TPH (>C12 to C28)	48.0	5.00	mg/L	50.0		96	75-125			
TPH 1005 Extraction	Completed		N/A							
Surrogate: Chlorooctane	4.96		mg/L	5.00		99	70-130			
Surrogate: Chlorooctadecane	5.31		mg/L	5.00		106	70-130			

LCS Dup (EGE0348-BSD1)

Prepared & Analyzed: 05/16/18

TPH (C6 to C12)	53.2	5.00	mg/L	50.0		106	75-125	2	20	
TPH (>C12 to C28)	48.2	5.00	mg/L	50.0		96	75-125	0.4	20	
TPH 1005 Extraction	Completed		N/A							
Surrogate: Chlorooctane	5.21		mg/L	5.00		104	70-130			
Surrogate: Chlorooctadecane	5.36		mg/L	5.00		107	70-130			

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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CTEH, LLC 5120 North Shore Drive North Little Rock AR, 72118	Project: 110325 Project Number: 110325 Project Manager: Mr. Kyle Bennett	Reported: 05/17/18 12:35
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QUALITY CONTROL
Petroleum Hydrocarbons by TNRCC 1005
Environmental Testing, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch EGE0348 - TPH 1005										
Matrix Spike (EGE0348-MS1)										
		Source: E8E0308-07			Prepared & Analyzed: 05/16/18					
TPH (C6 to C12)	53.8	4.83	mg/L	48.3	1.25	109	75-125			
TPH (>C12 to C28)	48.0	4.83	mg/L	48.3	1.31	97	75-125			
TPH 1005 Extraction	Completed		N/A							
Surrogate: Chlorooctane	5.43		mg/L	4.83		113	70-130			
Surrogate: Chlorooctadecane	5.40		mg/L	4.83		112	70-130			

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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E8E0308
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CTEH, LLC
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Project: 110325
 Project Number: 110325
 Project Manager: Mr. Kyle Bennett

Reported:
 05/17/18 12:35

QUALITY CONTROL

Volatile Organic Compounds by EPA Method 8260
 Environmental Testing, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
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Batch EGE0334 - EPA 5030 Soil MS

Blank (EGE0334-BLK1)

Prepared & Analyzed: 05/15/18

Dichlorodifluoromethane	<25.0	25.0	ug/Kg
Chloromethane	<25.0	25.0	ug/Kg
Vinyl chloride	<25.0	25.0	ug/Kg
Bromomethane	<25.0	25.0	ug/Kg
Chloroethane	<25.0	25.0	ug/Kg
Trichlorofluoromethane	<25.0	25.0	ug/Kg
Acrolein	<100	100	ug/Kg
1,1-Dichloroethene	<25.0	25.0	ug/Kg
Acetone	<100	100	ug/Kg
Iodomethane	<75.0	75.0	ug/Kg
Carbon disulfide	<25.0	25.0	ug/Kg
Methylene chloride	<100	100	ug/Kg
Acrylonitrile	<100	100	ug/Kg
Methyl tert-butyl ether (MTBE)	<25.0	25.0	ug/Kg
trans-1,2-Dichloroethene	<25.0	25.0	ug/Kg
Vinyl acetate	<25.0	25.0	ug/Kg
1,1-Dichloroethane	<25.0	25.0	ug/Kg
2-Butanone (MEK)	<25.0	25.0	ug/Kg
cis-1,2-Dichloroethene	<25.0	25.0	ug/Kg
2,2-Dichloropropane	<25.0	25.0	ug/Kg
Bromochloromethane	<25.0	25.0	ug/Kg
Chloroform	<25.0	25.0	ug/Kg
1,1,1-Trichloroethane	<25.0	25.0	ug/Kg
1,1-Dichloropropene	<25.0	25.0	ug/Kg
Carbon tetrachloride	<25.0	25.0	ug/Kg
Benzene	<25.0	25.0	ug/Kg
1,2-Dichloroethane	<25.0	25.0	ug/Kg
Trichloroethene	<25.0	25.0	ug/Kg
1,2-Dichloropropane	<25.0	25.0	ug/Kg
Dibromomethane	<25.0	25.0	ug/Kg
Bromodichloromethane	<25.0	25.0	ug/Kg
2-Chloroethylvinyl ether	<25.0	25.0	ug/Kg
cis-1,3-Dichloropropene	<25.0	25.0	ug/Kg
4-Methyl-2-pentanone (MIBK)	<25.0	25.0	ug/Kg
Toluene	<50.0	50.0	ug/Kg
trans-1,3-Dichloropropene	<25.0	25.0	ug/Kg
1,1,2-Trichloroethane	<25.0	25.0	ug/Kg
Tetrachloroethene	<25.0	25.0	ug/Kg
2-Hexanone	<25.0	25.0	ug/Kg
1,3-Dichloropropane	<25.0	25.0	ug/Kg

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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CTEH, LLC
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Project: 110325
 Project Number: 110325
 Project Manager: Mr. Kyle Bennett

Reported:
 05/17/18 12:35

QUALITY CONTROL

Volatile Organic Compounds by EPA Method 8260

Environmental Testing, Inc.

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

Batch EGE0334 - EPA 5030 Soil MS

Blank (EGE0334-BLK1)

Prepared & Analyzed: 05/15/18

Dibromochloromethane	<25.0	25.0	ug/Kg							
Chlorobenzene	<25.0	25.0	ug/Kg							
1,2-Dibromoethane (EDB)	<25.0	25.0	ug/Kg							
Ethylbenzene	<25.0	25.0	ug/Kg							
1,1,1,2-Tetrachloroethane	<25.0	25.0	ug/Kg							
m+p-Xylene	<50.0	50.0	ug/Kg							
o-Xylene	<25.0	25.0	ug/Kg							
Styrene	<25.0	25.0	ug/Kg							
Bromoform	<25.0	25.0	ug/Kg							
Isopropylbenzene	<25.0	25.0	ug/Kg							
1,1,2,2-Tetrachloroethane	<25.0	25.0	ug/Kg							
trans-1,4-Dichloro-2-butene	<25.0	25.0	ug/Kg							
1,2,3-Trichloropropane	<25.0	25.0	ug/Kg							
Bromobenzene	<25.0	25.0	ug/Kg							
n-Propylbenzene	<25.0	25.0	ug/Kg							
2-Chlorotoluene	<25.0	25.0	ug/Kg							
1,3,5-Trimethylbenzene	<25.0	25.0	ug/Kg							
4-Chlorotoluene	<25.0	25.0	ug/Kg							
4-Isopropyltoluene	<25.0	25.0	ug/Kg							
tert-Butylbenzene	<25.0	25.0	ug/Kg							
1,2,4-Trimethylbenzene	<25.0	25.0	ug/Kg							
sec-Butylbenzene	<25.0	25.0	ug/Kg							
1,3-Dichlorobenzene	<25.0	25.0	ug/Kg							
1,4-Dichlorobenzene	<25.0	25.0	ug/Kg							
n-Butylbenzene	<25.0	25.0	ug/Kg							
1,2-Dichlorobenzene	<25.0	25.0	ug/Kg							
1,2-Dibromo-3-chloropropane	<25.0	25.0	ug/Kg							
1,2,4-Trichlorobenzene	<25.0	25.0	ug/Kg							
Hexachlorobutadiene	<25.0	25.0	ug/Kg							
Naphthalene	<25.0	25.0	ug/Kg							
1,2,3-Trichlorobenzene	<25.0	25.0	ug/Kg							

Surrogate: Dibromofluoromethane	231	ug/Kg	250	92	72-128
Surrogate: 1,2-Dichloroethane-d4	231	ug/Kg	250	92	72.2-138
Surrogate: Toluene-d8	230	ug/Kg	250	92	68.9-135
Surrogate: 4-Bromofluorobenzene	261	ug/Kg	250	104	68.8-144

Environmental Testing, Inc.

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CTEH, LLC
 5120 North Shore Drive
 North Little Rock AR, 72118

Project: 110325
 Project Number: 110325
 Project Manager: Mr. Kyle Bennett

Reported:
 05/17/18 12:35

QUALITY CONTROL

Volatile Organic Compounds by EPA Method 8260
 Environmental Testing, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
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Batch EGE0334 - EPA 5030 Soil MS

LCS (EGE0334-BS1)

Prepared & Analyzed: 05/15/18

Chloromethane	420	25.0	ug/Kg	500		84	10.5-144			
Vinyl chloride	479	25.0	ug/Kg	500		96	28.9-163			
Bromomethane	319	25.0	ug/Kg	500		64	35-121			
Chloroethane	449	25.0	ug/Kg	500		90	36.9-156			
Trichlorofluoromethane	505	25.0	ug/Kg	500		101	76.2-150			
1,1-Dichloroethene	521	25.0	ug/Kg	500		104	86.3-151			
Methylene chloride	460	100	ug/Kg	500		92	73-137			
trans-1,2-Dichloroethene	489	25.0	ug/Kg	500		98	80.5-130			
1,1-Dichloroethane	451	25.0	ug/Kg	500		90	75.4-127			
Chloroform	441	25.0	ug/Kg	500		88	81.2-128			
1,1,1-Trichloroethane	488	25.0	ug/Kg	500		98	69.1-141			
Carbon tetrachloride	434	25.0	ug/Kg	500		87	60.8-157			
Benzene	466	25.0	ug/Kg	500		93	73.9-141			
1,2-Dichloroethane	446	25.0	ug/Kg	500		89	71.9-139			
Trichloroethene	492	25.0	ug/Kg	500		98	82.4-131			
1,2-Dichloropropane	514	25.0	ug/Kg	500		103	89.2-126			
Bromodichloromethane	434	25.0	ug/Kg	500		87	73.7-135			
2-Chloroethylvinyl ether	644	25.0	ug/Kg	500		129	27.2-134			
cis-1,3-Dichloropropene	511	25.0	ug/Kg	500		102	92.4-147			
Toluene	572	25.0	ug/Kg	500		114	79.9-123			
trans-1,3-Dichloropropene	509	25.0	ug/Kg	500		102	57.1-153			
1,1,2-Trichloroethane	520	25.0	ug/Kg	500		104	84.4-124			
Tetrachloroethene	491	25.0	ug/Kg	500		98	54.4-161			
Dibromochloromethane	457	25.0	ug/Kg	500		91	68.9-142			
Chlorobenzene	486	25.0	ug/Kg	500		97	69.9-128			
Ethylbenzene	513	25.0	ug/Kg	500		103	66.4-142			
Bromoform	482	25.0	ug/Kg	500		96	35.3-168			
1,1,2,2-Tetrachloroethane	480	25.0	ug/Kg	500		96	80.1-139			
1,3-Dichlorobenzene	480	25.0	ug/Kg	500		96	91.2-128			
1,4-Dichlorobenzene	477	25.0	ug/Kg	500		95	92.3-123			
1,2-Dichlorobenzene	493	25.0	ug/Kg	500		99	95.1-129			
Surrogate: Dibromofluoromethane	223		ug/Kg	250		89	72-128			
Surrogate: 1,2-Dichloroethane-d4	220		ug/Kg	250		88	72.2-138			
Surrogate: Toluene-d8	227		ug/Kg	250		91	68.9-135			
Surrogate: 4-Bromofluorobenzene	236		ug/Kg	250		94	68.8-144			

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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CTEH, LLC
 5120 North Shore Drive
 North Little Rock AR, 72118

Project: 110325
 Project Number: 110325
 Project Manager: Mr. Kyle Bennett

Reported:
 05/17/18 12:35

QUALITY CONTROL

Volatile Organic Compounds by EPA Method 8260

Environmental Testing, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
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Batch EGE0334 - EPA 5030 Soil MS

Matrix Spike (EGE0334-MS1)	Source: E8E0308-06	Prepared: 05/15/18	Analyzed: 05/16/18							
Chloromethane	76200	5000	ug/Kg	100000	ND	76	7.5-132			
Vinyl chloride	66100	5000	ug/Kg	100000	ND	66	13.2-165			
Bromomethane	88100	5000	ug/Kg	100000	ND	88	27.7-124			
Chloroethane	84100	5000	ug/Kg	100000	1580	83	28.4-166			
Trichlorofluoromethane	62900	5000	ug/Kg	100000	ND	63	42.6-178			
1,1-Dichloroethene	76500	5000	ug/Kg	100000	ND	76	54.2-188			
Methylene chloride	53000	20000	ug/Kg	100000	ND	53	43.4-164			
trans-1,2-Dichloroethene	86100	5000	ug/Kg	100000	ND	86	54.6-140			
1,1-Dichloroethane	86300	5000	ug/Kg	100000	ND	86	64.8-144			
Chloroform	82200	5000	ug/Kg	100000	286	82	61-139			
1,1,1-Trichloroethane	88100	5000	ug/Kg	100000	5980	82	68.7-155			
Carbon tetrachloride	67800	5000	ug/Kg	100000	ND	68	44.1-194			
Benzene	580000	5000	ug/Kg	100000	466000	114	55.9-165			
1,2-Dichloroethane	102000	5000	ug/Kg	100000	10200	91	62.5-138			
Trichloroethene	83000	5000	ug/Kg	100000	ND	83	69.5-145			
1,2-Dichloropropane	128000	5000	ug/Kg	100000	ND	128	78.3-147			
Bromodichloromethane	104000	5000	ug/Kg	100000	ND	104	74.6-130			
2-Chloroethylvinyl ether	40700	5000	ug/Kg	100000	ND	41	-7.13-204			
cis-1,3-Dichloropropene	100000	5000	ug/Kg	100000	ND	100	78.8-142			
Toluene	1630000	5000	ug/Kg	100000	1520000	115	46.6-158			
trans-1,3-Dichloropropene	96000	5000	ug/Kg	100000	467	96	65.3-123			
1,1,2-Trichloroethane	131000	5000	ug/Kg	100000	ND	131	66.2-139			
Tetrachloroethene	71000	5000	ug/Kg	100000	ND	71	43.6-182			
Dibromochloromethane	82400	5000	ug/Kg	100000	1260	81	67.4-110			
Chlorobenzene	83300	5000	ug/Kg	100000	ND	83	45.5-148			
Ethylbenzene	383000	5000	ug/Kg	100000	280000	103	74.7-164			
Bromoform	78600	5000	ug/Kg	100000	ND	79	49.2-118			
1,1,2,2-Tetrachloroethane	181000	5000	ug/Kg	100000	ND	181	47.7-144			M-02
1,3-Dichlorobenzene	82900	5000	ug/Kg	100000	ND	83	53.4-154			
1,4-Dichlorobenzene	82900	5000	ug/Kg	100000	ND	83	46.7-152			
1,2-Dichlorobenzene	85300	5000	ug/Kg	100000	ND	85	69.5-134			
Surrogate: Dibromofluoromethane	46700		ug/Kg	50000		93	72-128			
Surrogate: 1,2-Dichloroethane-d4	46500		ug/Kg	50000		93	72.2-138			
Surrogate: Toluene-d8	99100		ug/Kg	50000		198	68.9-135			M-02
Surrogate: 4-Bromofluorobenzene	60800		ug/Kg	50000		122	68.8-144			

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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CTEH, LLC
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Project: 110325
 Project Number: 110325
 Project Manager: Mr. Kyle Bennett

Reported:
 05/17/18 12:35

QUALITY CONTROL

Volatile Organic Compounds by EPA Method 8260
 Environmental Testing, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifiers
Batch EGE0334 - EPA 5030 Soil MS										
Matrix Spike Dup (EGE0334-MSD1)										
Source: E8E0308-06 Prepared: 05/15/18 Analyzed: 05/16/18										
Chloromethane	65000	5000	ug/Kg	100000	ND	65	7.5-132	16	20	
Vinyl chloride	64500	5000	ug/Kg	100000	ND	65	13.2-165	2	20	
Bromomethane	89500	5000	ug/Kg	100000	ND	90	27.7-124	2	20	
Chloroethane	81500	5000	ug/Kg	100000	1580	80	28.4-166	3	20	
Trichlorofluoromethane	60200	5000	ug/Kg	100000	ND	60	42.6-178	4	20	
1,1-Dichloroethene	73600	5000	ug/Kg	100000	ND	74	54.2-188	4	20	
Methylene chloride	51100	20000	ug/Kg	100000	ND	51	43.4-164	4	20	
trans-1,2-Dichloroethene	84200	5000	ug/Kg	100000	ND	84	54.6-140	2	20	
1,1-Dichloroethane	83100	5000	ug/Kg	100000	ND	83	64.8-144	4	20	
Chloroform	80300	5000	ug/Kg	100000	286	80	61-139	2	20	
1,1,1-Trichloroethane	85300	5000	ug/Kg	100000	5980	79	68.7-155	3	20	
Carbon tetrachloride	65300	5000	ug/Kg	100000	ND	65	44.1-194	4	20	
Benzene	583000	5000	ug/Kg	100000	466000	116	55.9-165	0.4	20	
1,2-Dichloroethane	99800	5000	ug/Kg	100000	10200	90	62.5-138	2	20	
Trichloroethene	80500	5000	ug/Kg	100000	ND	80	69.5-145	3	20	
1,2-Dichloropropane	126000	5000	ug/Kg	100000	ND	126	78.3-147	1	20	
Bromodichloromethane	103000	5000	ug/Kg	100000	ND	103	74.6-130	0.2	20	
2-Chloroethylvinyl ether	39400	5000	ug/Kg	100000	ND	39	-7.13-204	3	20	
cis-1,3-Dichloropropene	99700	5000	ug/Kg	100000	ND	100	78.8-142	0.7	20	
Toluene	1660000	5000	ug/Kg	100000	1520000	144	46.6-158	2	20	
trans-1,3-Dichloropropene	95700	5000	ug/Kg	100000	467	95	65.3-123	0.3	20	
1,1,2-Trichloroethane	134000	5000	ug/Kg	100000	ND	134	66.2-139	2	20	
Tetrachloroethene	67900	5000	ug/Kg	100000	ND	68	43.6-182	4	20	
Dibromochloromethane	83000	5000	ug/Kg	100000	1260	82	67.4-110	0.8	20	
Chlorobenzene	80900	5000	ug/Kg	100000	ND	81	45.5-148	3	20	
Ethylbenzene	382000	5000	ug/Kg	100000	280000	102	74.7-164	0.5	20	
Bromoform	80800	5000	ug/Kg	100000	ND	81	49.2-118	3	20	
1,1,2,2-Tetrachloroethane	181000	5000	ug/Kg	100000	ND	181	47.7-144	0.05	20	M-02
1,3-Dichlorobenzene	81000	5000	ug/Kg	100000	ND	81	53.4-154	2	20	
1,4-Dichlorobenzene	81400	5000	ug/Kg	100000	ND	81	46.7-152	2	20	
1,2-Dichlorobenzene	84300	5000	ug/Kg	100000	ND	84	69.5-134	1	20	
Surrogate: Dibromofluoromethane	46500		ug/Kg	50000		93	72-128			
Surrogate: 1,2-Dichloroethane-d4	46500		ug/Kg	50000		93	72.2-138			
Surrogate: Toluene-d8	97300		ug/Kg	50000		195	68.9-135			M-02
Surrogate: 4-Bromofluorobenzene	61900		ug/Kg	50000		124	68.8-144			

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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CTEH, LLC
 5120 North Shore Drive
 North Little Rock AR, 72118

Project: 110325
 Project Number: 110325
 Project Manager: Mr. Kyle Bennett

Reported:
 05/17/18 12:35

QUALITY CONTROL

Semivolatile Organic Compounds by EPA Method 8270
 Environmental Testing, Inc.

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

Batch EGE0357 - EPA 3540C

Blank (EGE0357-BLK1)

Prepared & Analyzed: 05/16/18

Analyte	Result	Reporting Limit	Units
Waste Dilution	Completed		N/A
n-Nitrosodimethylamine	<10000	10000	ug/Kg
Pyridine	<10000	10000	ug/Kg
Phenol	<10000	10000	ug/Kg
Bis(2-chloroethyl)ether	<10000	10000	ug/Kg
2-Chlorophenol	<10000	10000	ug/Kg
1,3-Dichlorobenzene	<10000	10000	ug/Kg
1,4-Dichlorobenzene	<10000	10000	ug/Kg
1,2-Dichlorobenzene	<10000	10000	ug/Kg
2-Methylphenol	<10000	10000	ug/Kg
Bis(2-chloroisopropyl)ether	<10000	10000	ug/Kg
n-Nitrosodi-n-propylamine	<10000	10000	ug/Kg
4-Methylphenol	<10000	10000	ug/Kg
Hexachloroethane	<10000	10000	ug/Kg
Nitrobenzene	<10000	10000	ug/Kg
Isophorone	<10000	10000	ug/Kg
2-Nitrophenol	<10000	10000	ug/Kg
2,4-Dimethylphenol	<10000	10000	ug/Kg
Bis(2-chloroethoxy)methane	<10000	10000	ug/Kg
2,4-Dichlorophenol	<10000	10000	ug/Kg
1,2,4-Trichlorobenzene	<10000	10000	ug/Kg
Naphthalene	<10000	10000	ug/Kg
Hexachlorobutadiene	<10000	10000	ug/Kg
4-Chloro-3-methylphenol	<10000	10000	ug/Kg
Hexachlorocyclopentadiene	<10000	10000	ug/Kg
2,4,6-Trichlorophenol	<10000	10000	ug/Kg
2,4,5-Trichlorophenol	<10000	10000	ug/Kg
2-Chloronaphthalene	<10000	10000	ug/Kg
Dimethyl phthalate	<10000	10000	ug/Kg
2,6-Dinitrotoluene	<10000	10000	ug/Kg
Acenaphthylene	<10000	10000	ug/Kg
Acenaphthene	<10000	10000	ug/Kg
2,4-Dinitrophenol	<10000	10000	ug/Kg
4-Nitrophenol	<10000	10000	ug/Kg
2,4-Dinitrotoluene	<10000	10000	ug/Kg
Diethyl phthalate	<10000	10000	ug/Kg
Fluorene	<10000	10000	ug/Kg
4-Chlorophenyl phenyl ether	<10000	10000	ug/Kg
4,6-Dinitro-2-methylphenol	<10000	10000	ug/Kg
n-Nitrosodiphenylamine	<10000	10000	ug/Kg

Environmental Testing, Inc.

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Reported:
 05/17/18 12:35

QUALITY CONTROL

Semivolatile Organic Compounds by EPA Method 8270
 Environmental Testing, Inc.

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

Batch EGE0357 - EPA 3540C

Blank (EGE0357-BLK1)

Prepared & Analyzed: 05/16/18

4-Bromophenyl phenyl ether	<10000	10000	ug/Kg							
Hexachlorobenzene	<10000	10000	ug/Kg							
Pentachlorophenol	<10000	10000	ug/Kg							
Phenanthrene	<10000	10000	ug/Kg							
Anthracene	<10000	10000	ug/Kg							
Di-n-butyl phthalate	<10000	10000	ug/Kg							
Fluoranthene	<10000	10000	ug/Kg							
Benzidine	<10000	10000	ug/Kg							
Pyrene	<10000	10000	ug/Kg							
Butyl benzyl phthalate	<10000	10000	ug/Kg							
Benzo(a)anthracene	<10000	10000	ug/Kg							
3,3'-Dichlorobenzidine	<10000	10000	ug/Kg							
Chrysene	<10000	10000	ug/Kg							
Bis(2-ethylhexyl)phthalate	<10000	10000	ug/Kg							
Di-n-octyl phthalate	<10000	10000	ug/Kg							
Benzo(b)fluoranthene	<10000	10000	ug/Kg							
Benzo(k)fluoranthene	<10000	10000	ug/Kg							
Benzo(a)pyrene	<10000	10000	ug/Kg							
Indeno(1,2,3-cd)pyrene	<10000	10000	ug/Kg							
Dibenz(a,h)anthracene	<10000	10000	ug/Kg							
Benzo(g,h,i)perylene	<10000	10000	ug/Kg							
Surrogate: 2-Fluorophenol	71300		ug/Kg	100000		71	1-116			
Surrogate: Phenol-d5	73500		ug/Kg	100000		74	19.8-107			
Surrogate: Nitrobenzene-d5	38100		ug/Kg	50000		76	1-110			
Surrogate: 2-Fluorobiphenyl	41200		ug/Kg	50000		82	18.3-108			
Surrogate: 2,4,6-Tribromophenol	88600		ug/Kg	100000		89	22-122			
Surrogate: Terphenyl-d14	50100		ug/Kg	50000		100	1-171			

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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 North Little Rock AR, 72118

Project: 110325
 Project Number: 110325
 Project Manager: Mr. Kyle Bennett

Reported:
 05/17/18 12:35

QUALITY CONTROL

Semivolatile Organic Compounds by EPA Method 8270
 Environmental Testing, Inc.

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

Batch EGE0357 - EPA 3540C

LCS (EGE0357-BS1)			Prepared & Analyzed: 05/16/18							
Phenol	23900	10000	ug/Kg	50000	48	27.3-99.8				
2-Chlorophenol	26400	10000	ug/Kg	50000	53	33.8-104				
1,4-Dichlorobenzene	51000	10000	ug/Kg	100000	51	30.5-115				
n-Nitrosodi-n-propylamine	27700	10000	ug/Kg	50000	55	25.7-99.4				
1,2,4-Trichlorobenzene	28100	10000	ug/Kg	50000	56	42.4-100				
4-Chloro-3-methylphenol	28200	10000	ug/Kg	50000	56	38.1-111				
Acenaphthene	30700	10000	ug/Kg	50000	61	39.8-112				
4-Nitrophenol	32500	10000	ug/Kg	50000	65	50.7-123				
2,4-Dinitrotoluene	78300	10000	ug/Kg	100000	78	53.4-141				
Pentachlorophenol	55800	10000	ug/Kg	100000	56	34.8-73.8				
Pyrene	43700	10000	ug/Kg	50000	87	58.6-113				
Benzo(a)anthracene	45500	10000	ug/Kg	50000	91	61.8-122				
Surrogate: 2-Fluorophenol	45900		ug/Kg	100000	46	1-116				
Surrogate: Phenol-d5	49400		ug/Kg	100000	49	19.8-107				
Surrogate: Nitrobenzene-d5	25300		ug/Kg	50000	51	1-110				
Surrogate: 2-Fluorobiphenyl	28100		ug/Kg	50000	56	18.3-108				
Surrogate: 2,4,6-Tribromophenol	77600		ug/Kg	100000	78	22-122				
Surrogate: Terphenyl-d14	45200		ug/Kg	50000	90	1-171				

LCS Dup (EGE0357-BSD1)

LCS Dup (EGE0357-BSD1)			Prepared & Analyzed: 05/16/18							
Phenol	41400	10000	ug/Kg	50000	83	27.3-99.8	54	20	L-03	
2-Chlorophenol	45700	10000	ug/Kg	50000	91	33.8-104	54	20	L-03	
1,4-Dichlorobenzene	92500	10000	ug/Kg	100000	92	30.5-115	58	20	L-03	
n-Nitrosodi-n-propylamine	46800	10000	ug/Kg	50000	94	25.7-99.4	51	20	L-03	
1,2,4-Trichlorobenzene	48700	10000	ug/Kg	50000	97	42.4-100	54	20	L-03	
4-Chloro-3-methylphenol	42000	10000	ug/Kg	50000	84	38.1-111	39	20	L-03	
Acenaphthene	47000	10000	ug/Kg	50000	94	39.8-112	42	20	L-03	
4-Nitrophenol	39400	10000	ug/Kg	50000	79	50.7-123	19	20		
2,4-Dinitrotoluene	90300	10000	ug/Kg	100000	90	53.4-141	14	20		
Pentachlorophenol	79400	10000	ug/Kg	100000	79	34.8-73.8	35	20	L-02	
Pyrene	48800	10000	ug/Kg	50000	98	58.6-113	11	20		
Benzo(a)anthracene	49700	10000	ug/Kg	50000	99	61.8-122	9	20		
Surrogate: 2-Fluorophenol	85700		ug/Kg	100000	86	1-116				
Surrogate: Phenol-d5	84800		ug/Kg	100000	85	19.8-107				
Surrogate: Nitrobenzene-d5	43400		ug/Kg	50000	87	1-110				
Surrogate: 2-Fluorobiphenyl	45800		ug/Kg	50000	92	18.3-108				
Surrogate: 2,4,6-Tribromophenol	93000		ug/Kg	100000	93	22-122				
Surrogate: Terphenyl-d14	50000		ug/Kg	50000	100	1-171				

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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CTEH, LLC
 5120 North Shore Drive
 North Little Rock AR, 72118

Project: 110325
 Project Number: 110325
 Project Manager: Mr. Kyle Bennett

Reported:
 05/17/18 12:35

Non-Certified Analyses included in this Report

Analyte

Certifications

Code	Description	Number	Expires
KDHE	Kansas Accredited	E-10401	01/31/2019
NELAP	NELAP Accredited (LDEQ)	10002	06/30/2018
ODEQ	Oklahoma Accredited	2017-128	08/31/2018
TCEQ	Texas Accredited	T104704498-18-8	03/31/2019

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CTEH, LLC 5120 North Shore Drive North Little Rock AR, 72118	Project: 110325 Project Number: 110325 Project Manager: Mr. Kyle Bennett	Reported: 05/17/18 12:35
--	--	-----------------------------

Qualifiers and Definitions

COM	Completed
E	Target analyte exceeded calibration range. The reported result is an estimated value.
L-02	The laboratory control spike recovery was higher than expected. This may cause a high bias to the reported result.
L-03	The laboratory control spike RPD was higher than expected.
M-02	The matrix spike recovery was higher than expected due to sample matrix interference.
S-03	The surrogate recovery for this sample cannot be accurately quantified due to sample dilution required from high analyte concentration and/or matrix interferences.
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
x	Non-Certified analyte
NA	Not Applicable

Environmental Testing, Inc.

Keith Hopcus For Russell Britten, President

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CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

5120 Northshore Drive - North Little Rock, AR 72118 - (p) 501.801.8500

Handwritten signature/ID: 8800308

www.cteh.com

CTEH Project #: 110325

Send Report To:

Name: **Kyle Bennett**
 Company: **CTEH, LLC**
 Address: **5120 North Shore Drive, North Little Rock, Arkansas 72118**
 Phone: **(501) 801-8500** Fax: **(501) 801-8501**
 e-mail: **labresults@cteh.com; kbennett@cteh.com; plujerina@cteh.com; jkind@cteh.com**
 Accounting: **Send Invoices to CTEH_invoiccapture@concur.com; invoice # and Vendor name in subject line**

Turnaround Requested: Normal Same Day Next Day (24 hr)
 Other (Specify) _____
 Data Packet Requested: Standard Level II Other _____ Level IV _____
 Sample and Extract Retention/Disposal:
 Dispose after 2X hold time
 Retain w/ storage fees after 2X hold time

Primary Sample Identification	Secondary Sample Identification	Sample Size	Units		Sample Date	Sample Time (for non-air samples)	Initials	TX 1005	EPA 8260	EPA 8270	Matrix
			L	cm ²							
SD01W0514S001	S001	4	02		05-14-18	2001	SR	X			S
SD01W0514S007	S007	4	02			2008	SR	X			S
SD01W0514S008	S008	4	02			2018	SR	X			S
SD01W0514S009	S009	4	02			2009	SR	X			S
SD01W0514S010	S010	4	02			2019	SR	X			S
SD01W0512P001	P001	40	ML		05-12-18	1003	UH	X	X	X	P
SD01W0514T001	T001	40	ML		05-14-18	2050	SR	X			W

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	COMMENTS
<i>Sasha Rowland</i>	05/15/0820	<i>Jeff Myers</i>	5-15-18 737	
<i>Jim My</i>	5/15/18 0900	<i>Jim My</i>	5-15-18 9:00	

SDG # SD11-20180514 *0.2 - 0.0 = 0.5 @ 0.0* *100* *E00184*

Page 1 of 1

E8E0308

Environmental Testing, Inc.

Client: CTEH, LLC	Project Manager: Russell Britten
Project: 110325	Project Number: 110325

Report To:
 CTEH, LLC
 Mr. Kyle Bennett
 5120 North Shore Drive
 North Little Rock, AR 72118
 Phone: (501) 801-8500
 Fax:

Invoice To:
 CTEH, LLC
 Accounts Payable
 5120 North Shore Drive
 North Little Rock, AR 72118
 Phone: (501) 801-8500
 Fax:

Date Duc: 05/16/18 17:00 (1 day TAT)	Date Received: 05/15/18 09:00
Received By: Erin Langer	Date Logged In: 05/15/18 09:11
Logged In By: Andra Hoot	

Samples Received at: 5.6°C			
Custody seals No	Received on ice Yes	Sufficient sample Yes	
Containers intact Yes	Sample or temp blank frozen No		
COC/Labels agree Yes	Headspace in VOA vials No		
Preservation confirmed No	Correct containers Yes		

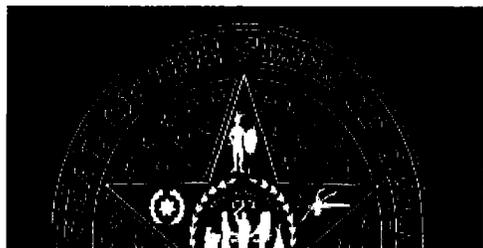
Notes:

Preservation Confirmation

Container ID	Container Type	pH	Date/Time	Lot #
--------------	----------------	----	-----------	-------

Preservation Confirmed By _____ Date _____

Reviewed By _____ Date _____



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OCC Oil & Gas Conservation Water Quality Standards Implementation Plan

Statutory Authority, Definitions, Standards, Jurisdiction, Beneficial Uses and Protocols

Document date March 26, 2001 -- Effective July 1, 2001

Section A. Statutory Authority, Required WQSIP Elements

Section B. Pertinent Definitions, Abbreviations and Acronyms for Corp Commission O&G

Section C. General Statement; Responsibility For WQSIP Document

Section D. Pertinent Oklahoma Water Quality Standards

- Surface Water
- Ground Water

Section E. Functional Jurisdictions within the Corporation Commission

Section F. Specific Corp Commission Jurisdictional Areas of Environmental Responsibility

Section G. Beneficial Uses

Section H. USAP and Corporation Commission Assessment and Cleanup Protocols

SECTION II.

WQSIP ELEMENTS BY JURISDICTIONAL AREA

Corp Commission O&G Water Quality Decision Level Criteria

Jurisdictional Area

TABLES

- I -- Specific Jurisdictional Areas of Environmental Responsibility
- II -- Jurisdictional Areas Verses Beneficial Uses That Could Be Affected
- III -- Pertinent Water Quality

Decision Level Criteria Used by Corp Commission O&G

SECTION I**STATUTORY AUTHORITY, DEFINITIONS, STANDARDS, JURISDICTION, BENEFICIAL USES AND PROTOCOLS****Section A. Statutory Authority**

Subsection B, 27A O.S. Supp 1998, Section 1-1-202 (enacted through Senate Bill 549), mandates that each state environmental agency shall promulgate, by July 1, 2001, a Water Quality Standards Implementation Plan for its jurisdictional areas of environmental responsibility specifying how the agency utilizes and enforces the Oklahoma Water Quality Standards for surface water and groundwater. The Implementation Plan must be promulgated in compliance with the Administrative Procedures Act and pursuant to Section 1-1-202. After initial promulgation, each state environmental agency must review its plan at least every three years thereafter to determine whether revisions to the plan are necessary.

Each Water Quality Standards Implementation Plan is to include eight elements or items:

1. **Program Compliance with Anti-degradation Requirements and Protection of Beneficial Uses.** General description of the processes, procedures and methodologies utilized to ensure that programs within the agency's jurisdictional areas of environmental responsibility comply with anti-degradation standards and lead to maintenance of water quality where beneficial uses are supported, removal of threats to water quality where beneficial uses are in danger of not being supported, and restoration of water quality where beneficial uses are not being supported.
2. **Application of Use Support Assessment Protocols (USAP)**- Procedures to be utilized in the application of use support assessment protocols (found at OAC 785:46, Subchapter 15) to make impairment determinations.
3. **Description of Programs Affecting Water Quality** - Description of the surface water and/or groundwater quality-related components of pertinent programs within each jurisdictional area.
4. **Technical Information and Procedures** - Technical information, databases, and procedures to be utilized by Corp Commission+ O&G in the WQSIP.
5. **Integration of WQSIP into Corp Commission O&G Water Quality Activities** - Description of how the Water Quality Standards Implementation Plan is and/or will be integrated into the water quality management activities of the agency, including rules, program area policies and guidance, and/or standardized methods of conducting business.
6. **Compliance with Mandated Statewide Water Quality Requirements** - Describes how Corp Commission O&G is or will be complying with mandated statewide requirements affecting water quality developed by other state environmental agencies, including (but not limited to), total maximum daily load (TMDL) development, nonpoint source (NPS) pollution prevention programs, Oklahoma Water Quality Standards (OWQS), OWQS implementation procedures, and the Continuing Planning Process (CPP) document.
7. **Public and Interagency Participation** Summary of written comments and testimony received relative to all public meetings held for the purpose of providing public participation relating to the WQSIP, and new rules related to the WQSIP
8. **Evaluation of Effectiveness of Agency Activities** - Description of methods and means to evaluate the effectiveness of activities conducted pursuant to WQSIP to achieve Water Quality Standards

To the extent the required elements or items listed above will not result in a rule as defined by the Administrative Procedures Act, that information will be listed in the WQSIP. The Guidance Document of Technical Measures, which covers the Oklahoma Corporation Commission Oil & Gas Conservation Divisions pollution prevention rules that do not specifically reference or use the states water quality standards, is available from the PA/UIC department upon request, as are the other guidance documents referenced in the WQSIP. The partial listing of Conservation Division rules in these guidance documents is not intended to be an exhaustive notation. Compliance with specific areas of the Conservation Division's jurisdiction requires compliance with rules applicable to those operations, which are found in the Oklahoma Corporation Commission Oil and Gas Conservation rules, OAC 165 Chapter 10.

Section B. Pertinent Definitions, Abbreviations and Acronyms for Corp Commission O&G

- **40 CFR** means *Title 40 of the Code of Federal Regulations*
- **104** means *Section 104 of the CWA*, which provides federal grants for water quality management activities & projects
- **106** means *Section 106 of the CWA*, which provides annual grants for water quality management activities (especially for groundwater) and special projects. Currently administered by DEQ
- **303** means *Section 303 of the CWA*, which requires states to review and, as necessary, revise their water quality standards at least every three year
- **303(d)** means *Section 303(d) of the CWA*, which requires states to identify waters that do not or are not expected to meet applicable water quality standards (this is sometimes referred to as the 303(d) List). States must also establish priority rankings for the listed waters, taking into account pollution severity and designated beneficial uses of the waters. State must develop TMDLs for waters on this list according to priority rankings
- **303(e)** means *Section 303(e) of the CWA*, which requires each state to prepare a CPP document. See also *CPP*
- **305 (b)** means *Section 305(b) of the CWA*, which provides the process for and requires the preparation and submittal of a Water Quality Assessment Report (sometimes referred to as the 305(b) Report) by each state. This process was established as a means for the EPA and Congress to determine the status of the Nations waters
- **319** means *Section 319 of the CWA*, which requires development of a State Assessment Report and a Management Program for Nonpoint Source (NPS) pollution problems. The Assessment Report describes the nature, extent, and effects of NPS pollution in each state, as well as the causes and sources of such pollution. The Management Program describes what a state intends to accomplish in the next four-year period to address NPS pollution problems
- **319h** means the *Grant Program under section 319h of the CWA*, the funds from which are currently going to the Oklahoma Conservation Commission
- **Appendix A** means *Appendix A of the OWQS, OAC 785:45*, which has the designated beneficial uses of all major and some smaller water bodies listed in Table 1 of the Appendix. For some water bodies I, II, or III (for the water bodies Appendix C Class) is posted under Agricultural uses in Table I; the TDS, chloride, and sulfate water quality standards for the rest of the water bodies listed in Table I default to their Appendix F values
- **Appendix F** means *Appendix F of the OWQS, OAC 785:45*, which lists the three classes (I, II, and III) of agricultural water bodies based on the total levels of cations and anions present. Class I water bodies must be under 700 mg/l TDS, Class II from 700 to 2100 mg/l, and Class III allows over 2100 mg/l.

g mud means any mixture of water and clay or other material from the oil & gas industry in the drilling of wells

the OWQS, OAC 785:45, which has a mean sulfate by watershed for most of the watersheds, both a mean standard (the lower) and a higher individual sample standard

nonpoint source means a source without a well defined point of origin or a discernible origin such as an outfall pipe, often involving the overland flow of storm water or the subsurface flow of chemicals with storm water over a wide area

any formation or part of a formation or sedimentary rock capable of yielding a significant amount of hydrocarbon (1 gallon per minute sustained yield) that is suitable for domestic use, or for seasonal agricultural use

Oil and Gas Pollution Excess sediment, petroleum products (either measured as BTEX, GRO, and DRO) from sources such as crude oil, brine, and brine components (salinity) are some of the substances associated with the exploration for and production of oil and gas that cause pollution and are thus of concern to Corp Commission O&G

which is characterized by determining the hydraulic head (water table) or hydraulically up gradient source of a substance(s) being discharged

means the *National Pollutant Discharge Elimination System*, as authorized by Section 402 of the CWA. The DEQ has received delegation of authority for the program in Oklahoma for most point sources; the EPA has retained permitting authority for jurisdictional areas related to agriculture and the oil and gas industry

total dissolved solids (TDS) and a site, measured as TDS, which is a resource to be protected because the water is unusable by people (3000 ppm TDS)

nonpoint source see above

Best Management Practice(s): , a technique determined to be the most effective of preventing or reducing discharges from a source to meet water quality goals. The term is used in the context of nonpoint source pollution

Oklahoma Administrative Code

Oklahoma Conservation Commission

Oklahoma Department of Agriculture

Oklahoma Department of Mines

Oklahoma Department of Wildlife Conservation

means the *Oklahoma Energy Resources Board* , which is voluntarily established by oil & gas producers and royalty owners

oil and gas

benzene, toluene, and xylenes, light end petroleum products, and gasoline and present in lower concentrations than other hydrocarbons such as crude oil and diesel

means the *Gas Conservation Division* of Corp Commission

Rotating Bump Program , a program developed by the DEQ in 1998, Section 1-3-101, for monitoring water quality for the purpose of determining the effectiveness of water quality management practices allegedly from entities and/or activities that have been included in the rotating BUMP

means *Oklahoma Risk Based Corrective Action* , the form of RBCA authorized by the PST Division of the Oklahoma Corporation Commission see

refers to an *Interim Order* or *Consent Order*, issued following a hearing before an Administrative Law Judge

refers to a substance that is present at excessive, unhealthy, and/or objectionable concentrations of a substance. For the purposes of this act, a substance exceeding water quality standards causing beneficial use impairments are in or out of compliance with the standards of the State)

means *Outstanding Resource Water*, defined as a water of the state that is an outstanding resource or is of exceptional recreational or scientific significance. ORWs must receive special protection against

Oklahoma Corporation Commission

means the *Occupational Safety and Health Act* and amendments

Water Quality Management Plan Process document, submitted by the permittee and approved by the permittee and planned water quality management strategy used by the State in conducting water quality monitoring. The state utilizes the WQS and WQS standards as defined in this document

means the *Oklahoma State University Soil, Water and Forage Laboratory*, which analyzes soil and irrigation water samples for a variety of cations, anions, Total Soluble Salts, and related compounds at spill or pollution sites for Corp Commission O&G. The lab also analyzes stream water samples for Corp Commission O&Gs NPS stream monitoring program

Waters of the State identified by recognized Tribal Nations and the waters utility for cultural, historic, or scientific purposes

means the *Oklahoma Water Quality Monitoring Council*, consisting of representatives from state agencies, tribes, federal agencies, and other state water quality stakeholder groups

amendments thereto

means the *Oklahoma Water Resources Board*

means *Cool Water Aquatic Community*, a category of Fish and Wildlife Propagation where water temperature and habitat are adequate to support cool water fish communities and includes an abundance of cool water benthic organisms

means the *Pollution Abatement/UIC* Department within the Oil & Gas Division of Corp Commission consisting of the Pollution Abatement and UIC

Standard of Environmental Quality

- **Pathway** means the route(s) or media via which various substances can reach receptors, or reach a receptor point or location such as a well where receptors are exposed to the substances. Pathways can include both natural routes through water, soil, and air, and manmade conduits
- **PBCR** means *Primary Body Contact Recreation*, a WQS beneficial use designation
- **Plan** *Water Quality Standards Implementation Plan*
- **Plug** means the closing off, in a manner proscribed by the Corporation Commission, of all oil, gas, and water bearing formations in any producing or non-producing wellbore before such well is abandoned
- **Plume** means the substances impact area within a surface water body or ground water area, generally moving downstream or down-gradient from the source
- **Pollutant** means any material or substance that is present at levels (as per the WQS and USAP) which may cause pollution
- **Pollution** means (for Corp Commission O&G) the contamination of fresh water or soil, either surface or subsurface, by salt water, mineral brines, waste oil, oil, gas, and/or other deleterious substances produced from or obtained or used in connection with the drilling, development, producing, refining, transporting, or processing of oil or gas within the State of Oklahoma
- **Point Source** means any discernible, confined and discrete conveyance from which substances are or may be discharged such as a discharge pipe (see also definition in OAC 785:45)
- **PPWS** means *Public and Private Water Supply*, a WQS beneficial use designation for the protection of human health for the consumption of water and consumption of fish flesh and water. Not synonymous with primary and secondary drinking water standards
- **ppb** means *parts per billion*, the milligrams of a substance per 1,000 kilograms of solid material (usually soil) or the milligrams of the substance per 1000 liters of water (for dissolved substances)
- **ppm** means *parts per million*, the milligrams of a substance per kilogram of solid material (usually soil) or the milligrams of substance per liter of water (for dissolved substances)
- **Property Assessments** means a site investigation using soil and water sampling done to determine whether or not there is pollution on a certain property. This is often done by a potential property buyer or company merger partner to determine whether or not they are acquiring polluted property, but may also be done by the owner or lessee of property to determine their possible pollution liabilities. The actual source of the pollution and when the spill/release occurred may not be known or determinable. Pollution cases arising from Property Assessments are assigned to the PA section
- **PST** means the *Petroleum Storage Tank* Division of the Corporation Commission
- **RBCA** means *Risk Based Corrective Action*, a methodology for 1) determining the risks to health from specific (analytically measured) concentrations of petroleum compounds in various media (soil, water, air) at specified locations, and 2) determining the cleanup standards to be used and the remediation necessary at pollution sites
- **RCRA** means the *Resource Conservation and Recovery Act* and amendments thereto

- **Receptor** means a living organism that can be sickened, injured or killed by any polluting substances released. While the Oklahoma Water Quality Standards regulate what levels of various substances can be allowed in state water bodies, these water bodies can only be receptor locations of the substances, and are not themselves receptors as Corp Commission uses the term
- **Receptor point (or location)** means the point or area where a receptor is exposed to various substances by, for example, inhaling vapors, touching or ingesting contaminated soil, or swimming in or drinking polluted water
- **RFA** means *Request for Assistance*, when the Field Operations section requests assistance on complex and/or water related pollution and spill cases from staff in the Pollution Abatement section. Some of these cases are directly assigned to PA staff for oversight, as are cases arising from Phase I or II property assessments
- **Remediation** means the removal of pollutants from soil and/or water by absorption, excavation, pumping, natural attenuation, biological, chemical, or other means or combination of methods
- **RP** means *Responsible Party*, the company or other entity legally and financially responsible for cleaning up a spill or other conditions of soil or water constituting pollution
- **SEL** means the *State Environmental Laboratory* of the DEQs Customer Services Division
- **Spill** means the unpermitted or unauthorized surface or subsurface release of substances including but not limited to petroleum (gasoline, diesel, crude oil and/or condensate), brine, or drilling mud
- **SWS** means *Sensitive Water Supply*, defined as a water body which constitutes a sensitive public and private water supply
- **TDS** means *Total Dissolved Solids*, measured dried at 180 C in a laboratory analytical test or measured in the field with a conductivity meter calibrated to read as TDS
- **TMDL** means *Total Maximum Daily Load*, a written, pollutant-specific and water body-specific plan establishing pollutant loads for point and nonpoint sources, incorporating safety reserves, to ensure that a specific water body will attain and maintain the water quality necessary to support existing and designated beneficial uses. The term also includes consideration of increases in pollutant loads
- **TPH** means *Total Petroleum Hydrocarbons*, found in soil or water by laboratory analyses using DEQ and/or EPA defined methods. GRO and DRO are often summed as TPH, even though the overlap in their analytical ranges and the omission of the (low percent by weight) higher carbon number compounds in DRO analyses makes this inexact
- **TSS** means *Total Soluble Salts*, the total amount of salts, ppm, dissolved in water according to laboratory (OSU) testing
- **UAA** means *Use Attainability Analysis*, an investigation by OWRB of whether a WWAC or CWAC sub categorization (for the Fish and Wildlife Propagation beneficial use) is reasonably attainable. HLAC sub categorization of a water body requires a UAA prior to adoption
- **UIC** means *Underground Injection Control*
- **USAP** means *Use Support Assessment Protocols*, defining how sampling and other data shall be used to determine whether or not a water body is meeting water quality standards and its beneficial uses, as defined at OAC 785:46, Subchapter 15
- **USFWS** means the *United States Fish and Wildlife Service*

- **USGS** means the *United States Geological Survey*
- **Waters of the State** means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this State or any portion thereof (82:1084.2(3))
- **WQMP** means *Water Quality Management Plan*, a statewide plan incorporating the various water quality management program elements under the CWA. Sometimes referred to as the 208 Plan. Water quality management plans are also developed by designated area-wide planning agencies
- **WQS (or OWQS)** means the *Oklahoma Water Quality Standards*, established pursuant to Section 303 of the CWA, and which serve as goals for water quality management planning and benchmark criteria for the NPDES/OPDES permitting process. Water Quality Standards consist of beneficial use classifications for navigable waters, water quality criteria to support those uses, and an antidegradation policy statement. Oklahoma's Water Quality Standards are found at OAC 785:45
- **WQS Implementation Criteria** means *Water Quality Standards Implementation Criteria*, procedures used to implement the WQS. Some WQS Implementation Criteria including USAP are found at OAC 785:46
- **WQSIP** means *Water Quality Standards Implementation Plan*
- **WWAC** as defined in OAC 785:45, means *Warm Water Aquatic Community*, a subcategory of the beneficial use category Fish and Wildlife Propagation where the water quality and habitat are adequate to support climax fish communities and includes an environment suitable for the full range of warm water benthos

Section C - General Statement; Responsibility For WQSIP Document

Programs within the Corporation Commissions environmental regulatory authority will be managed to minimize the possibility of contact between regulated substances (including liquid petroleum, natural gas, brine, drilling mud, and drill cuttings) and the fresh waters of the state, and to oversee remediation efforts when problems are found.

This WQSIP was prepared by the NPS Coordinator and reviewed by staff in the Pollution Abatement section of the Oil & Gas Conservation Division and by the Deputy General Counsel for Oil & Gas. There are a few issues, such as exactly how a hydrogeologic basins groundwater vulnerability level will be considered by Corp Commission O&G in its UIC, land application, and/or pit construction rules and policies, and whether revised or additional erosional and runoff rules are appropriate, that have not yet been addressed by Corp Commission O&G. If any changes to these rules are necessary, they will be included in a future revision of the WQSIP and rules.

Section D. Pertinent Oklahoma Water Quality Standards

1. Surface Water

Pursuant to Section 303 of the CWA, Oklahoma's surface water quality standards are promulgated by the OWRB at OAC 785:45, Subchapter 5 Surface water quality standards are comprised of three elements:

1. **Beneficial uses**, designated to apply to specific water bodies or defined water body segments, as listed in Appendix A to OAC 785:45, and which generally address the goals of the CWA. Certain default beneficial uses are assumed for waters not listed in Appendix A until a UAA may indicate otherwise. The subset of beneficial uses which address water quality (as opposed to quantity) are

- Public and Private Water Supply (PPWS) (OAC 785:45-5-10);

- Fish and Wildlife Propagation (F&W) (OAC 785:45-5-12), according to one of four fishery subcategories:
- Habitat-Limited Aquatic Community (HLAC)
- Warm Water Aquatic Community (WWAC)
- Cool Water Aquatic Community (CWAC)
- Trout Fishery (Put and Take)
- Agriculture (Ag) (OAC 785:45-5-13);
- Primary Body Contact Recreation (PBCR) (OAC 785:45-5-16);
- Secondary Body Contact Recreation (OAC 785:45-5-17);
- Fish Consumption (OAC 785:45-5-20)

2. Numerical and narrative criteria (OAC 785:45-5) apply statewide. Numerical criteria are substance-specific and apply to a water body according to its beneficial uses in accordance with OAC 785:45. Narrative criteria are generally referred to as free from prohibitions.

- Numerical salinity water quality standards have been set only for agricultural beneficial uses (irrigation and watering livestock). Stream segment averages of historic data for chlorides, sulfates, and TDS are available in Appendix F for most stream segments statewide. The WQS also allows for use of upstream/background data and data from surrounding streams instead of these averages if this data provides a more appropriate basis for setting standards for a specific stream (OAC 785:45-5-13(f&g)).
- OAC 785:45-5-13 (e) states that Increased mineralization from other elements such as calcium, magnesium, sodium, and their associated anions shall be maintained at or below a level that will not restrict ANY BENEFICIAL USE, which OWRB interprets as meaning that neither salinity nor other minerals shall be allowed to impair the PPWS, F&W, PBCR, and other beneficial uses listed for streams in the WQS. Even though there are no numerical standards for salinity set for these other beneficial uses, it is Corp Commission O&Gs goal to act within its regulatory authority so as to protect such uses from adverse impacts, including the setting of site specific numerical water quality criteria.
- Oklahoma WQS contain numeric standards for some of the common components of petroleum (e.g. benzene, ethylbenzene, and toluene) known to have adverse health effects which can be used as indicators of the presence of petroleum for PPWS and F&W (toxicity to aquatic life and toxicity of fish flesh to humans)beneficial uses. Corp Commission O&G has set risk-based criteria for some of the other petroleum compounds with no numeric standards. Narrative criteria including no visible oil also apply
- Excess sediment impacts may be addressed through the numeric turbidity standards established for F&W metal numerical WQ standards have been set by OWRB for many beneficial uses
- water quality anti-degradation policy, which applies statewide and is, consistent with the goals of the CWA, is found at OAC 785:45, Subchapter 3. Anti-degradation policy implementation is found at OAC 785:45-5-25 and OAC 785:46, Subchapter 13. There are three levels of protection:
 - Attainment or maintenance of existing or designated beneficial uses (Tier 1).