Client Sample ID: 4413-020818-0001
Date Collected: 02/08/18 12:30
Date Received: 02/10/18 08:00

Lab Sample ID: 240-91369-19
Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		200	47.3	ug/L		02/12/18 14:00	02/13/18 16:49	1
Arsenic	**146**		10.0	4.05	ug/L		02/12/18 14:00	02/13/18 16:49	1
Barium	ND		200	1.33	ug/L		02/12/18 14:00	02/13/18 16:49	1
Beryllium	ND	^	4.00	0.601	ug/L		02/12/18 14:00	02/13/18 16:49	1
Cadmium	**8.38**		2.00	0.203	ug/L		02/12/18 14:00	02/13/18 16:49	1
Calcium	ND		5000	307	ug/L		02/12/18 14:00	02/13/18 16:49	1
Chromium	ND		5.00	0.625	ug/L		02/12/18 14:00	02/13/18 16:49	1
Cobalt	**8.30**	**J**	10.0	0.752	ug/L		02/12/18 14:00	02/13/18 16:49	1
Copper	ND		25.0	3.55	ug/L		02/12/18 14:00	02/13/18 16:49	1
Iron	ND		100	26.0	ug/L		02/12/18 14:00	02/13/18 16:49	1
Lead	**45.2**		5.00	2.77	ug/L		02/12/18 14:00	02/13/18 16:49	1
Magnesium	ND		5000	776	ug/L		02/12/18 14:00	02/13/18 16:49	1
Manganese	ND		15.0	2.12	ug/L		02/12/18 14:00	02/13/18 16:49	1
Nickel	**3.17**	**J**	40.0	2.20	ug/L		02/12/18 14:00	02/13/18 16:49	1
Potassium	ND		5000	557	ug/L		02/12/18 14:00	02/13/18 16:49	1
Selenium	**82.2**		15.0	5.96	ug/L		02/12/18 14:00	02/13/18 16:49	1
Silver	ND		5.00	0.623	ug/L		02/12/18 14:00	02/13/18 16:49	1
Sodium	ND		5000	560	ug/L		02/12/18 14:00	02/13/18 16:49	1
Vanadium	ND		50.0	5.56	ug/L		02/12/18 14:00	02/13/18 16:49	1
Zinc	**22.6**	**J**	50.0	9.67	ug/L		02/12/18 14:00	02/13/18 16:49	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00	0.570	ug/L		02/12/18 14:00	02/13/18 17:17	1
Thallium	ND		1.00	0.200	ug/L		02/12/18 14:00	02/13/18 17:17	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.130	ug/L		02/12/18 14:00	02/13/18 14:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		0.0100	0.00600	mg/L		02/13/18 13:11	02/13/18 15:27	1

Client Sample ID: MW4DR-020718-1420
Date Collected: 02/07/18 14:20
Date Received: 02/10/18 08:00

Lab Sample ID: 240-91369-20
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		1000	176	ug/L			02/15/18 18:52	100
Benzene	**1780**		100	28.0	ug/L			02/15/18 18:52	100
Bromobenzene	ND		100	31.0	ug/L			02/15/18 18:52	100
Bromochloromethane	ND		100	47.0	ug/L			02/15/18 18:52	100
Bromodichloromethane	ND		100	30.0	ug/L			02/15/18 18:52	100
Bromoform	ND		100	43.0	ug/L			02/15/18 18:52	100
Bromomethane	ND		100	42.0	ug/L			02/15/18 18:52	100
2-Butanone (MEK)	ND		1000	102	ug/L			02/15/18 18:52	100
Carbon disulfide	ND		100	34.0	ug/L			02/15/18 18:52	100
Carbon tetrachloride	ND		100	35.0	ug/L			02/15/18 18:52	100
Chlorobenzene	ND		100	32.0	ug/L			02/15/18 18:52	100
Chlorodibromomethane	ND		100	25.0	ug/L			02/15/18 18:52	100
Chloroethane	ND		100	41.0	ug/L			02/15/18 18:52	100
Chloroform	ND		100	31.0	ug/L			02/15/18 18:52	100
Chloromethane	ND		100	43.0	ug/L			02/15/18 18:52	100
2-Chlorotoluene	ND		100	28.0	ug/L			02/15/18 18:52	100
4-Chlorotoluene	ND		100	23.0	ug/L			02/15/18 18:52	100
cis-1,2-Dichloroethene	ND		100	30.0	ug/L			02/15/18 18:52	100
cis-1,3-Dichloropropene	ND		100	26.0	ug/L			02/15/18 18:52	100
1,2-Dibromoethane (EDB)	ND		100	23.0	ug/L			02/15/18 18:52	100
Dibromomethane	ND		100	46.0	ug/L			02/15/18 18:52	100
1,2-Dichlorobenzene	ND		100	26.0	ug/L			02/15/18 18:52	100
1,3-Dichlorobenzene	ND		100	32.0	ug/L			02/15/18 18:52	100
1,4-Dichlorobenzene	ND		100	23.0	ug/L			02/15/18 18:52	100
Dichlorodifluoromethane	ND		100	50.0	ug/L			02/15/18 18:52	100
1,1-Dichloroethane	ND		100	25.0	ug/L			02/15/18 18:52	100
1,2-Dichloroethane	ND		100	30.0	ug/L			02/15/18 18:52	100
1,1-Dichloroethene	ND		100	27.0	ug/L			02/15/18 18:52	100
1,2-Dichloropropane	ND		100	30.0	ug/L			02/15/18 18:52	100
1,3-Dichloropropane	ND		100	29.0	ug/L			02/15/18 18:52	100
2,2-Dichloropropane	ND		100	34.0	ug/L			02/15/18 18:52	100
1,1-Dichloropropene	ND		100	28.0	ug/L			02/15/18 18:52	100
Ethylbenzene	ND		100	26.0	ug/L			02/15/18 18:52	100
Hexachlorobutadiene	ND		100	36.0	ug/L			02/15/18 18:52	100
2-Hexanone	ND		1000	123	ug/L			02/15/18 18:52	100
Isopropylbenzene	ND		100	21.0	ug/L			02/15/18 18:52	100
Methylene Chloride	**61.3**	**J B**	100	53.0	ug/L			02/15/18 18:52	100
4-Methyl-2-pentanone (MIBK)	ND		1000	71.0	ug/L			02/15/18 18:52	100
Methyl tert-butyl ether	ND		100	27.0	ug/L			02/15/18 18:52	100
Naphthalene	ND		100	25.0	ug/L			02/15/18 18:52	100
n-Butylbenzene	ND		100	21.0	ug/L			02/15/18 18:52	100
N-Propylbenzene	ND		100	45.0	ug/L			02/15/18 18:52	100
p-Isopropyltoluene	ND		100	29.0	ug/L			02/15/18 18:52	100
sec-Butylbenzene	ND		100	27.0	ug/L			02/15/18 18:52	100
Styrene	ND		100	23.0	ug/L			02/15/18 18:52	100
tert-Butylbenzene	ND		100	26.0	ug/L			02/15/18 18:52	100
1,1,1,2-Tetrachloroethane	ND		100	46.0	ug/L			02/15/18 18:52	100
1,1,2,2-Tetrachloroethane	ND		100	32.0	ug/L			02/15/18 18:52	100
Tetrachloroethene	ND		100	30.0	ug/L			02/15/18 18:52	100

Client Sample ID: MW4DR-020718-1420
Date Collected: 02/07/18 14:20
Date Received: 02/10/18 08:00

Lab Sample ID: 240-91369-20
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND		100	23.0	ug/L			02/15/18 18:52	100
trans-1,2-Dichloroethene	ND		100	29.0	ug/L			02/15/18 18:52	100
trans-1,3-Dichloropropene	ND		100	31.0	ug/L			02/15/18 18:52	100
1,2,3-Trichlorobenzene	ND		100	35.0	ug/L			02/15/18 18:52	100
1,2,4-Trichlorobenzene	ND		100	27.0	ug/L			02/15/18 18:52	100
1,1,1-Trichloroethane	ND		100	23.0	ug/L			02/15/18 18:52	100
1,1,2-Trichloroethane	ND		100	34.0	ug/L			02/15/18 18:52	100
Trichloroethene	ND		100	33.0	ug/L			02/15/18 18:52	100
Trichlorofluoromethane	ND		100	50.0	ug/L			02/15/18 18:52	100
1,2,3-Trichloropropane	ND		100	54.0	ug/L			02/15/18 18:52	100
1,2,4-Trimethylbenzene	ND		100	24.0	ug/L			02/15/18 18:52	100
1,3,5-Trimethylbenzene	ND		100	24.0	ug/L			02/15/18 18:52	100
Vinyl chloride	ND		100	45.0	ug/L			02/15/18 18:52	100
Xylenes, Total	ND		200	24.0	ug/L			02/15/18 18:52	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*88*		*69 - 120*		*02/15/18 18:52*	*100*
Dibromofluoromethane (Surr)	*94*		*69 - 124*		*02/15/18 18:52*	*100*
1,2-Dichloroethane-d4 (Surr)	*99*		*61 - 138*		*02/15/18 18:52*	*100*
Toluene-d8 (Surr)	*96*		*73 - 120*		*02/15/18 18:52*	*100*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthylene	**0.682**		0.200	0.0200	ug/L		02/12/18 06:48	02/16/18 12:50	1
Anthracene	**0.547**		0.200	0.0310	ug/L		02/12/18 06:48	02/16/18 12:50	1
Benzo[a]anthracene	ND		0.200	0.0590	ug/L		02/12/18 06:48	02/16/18 12:50	1
Benzo[a]pyrene	ND		0.200	0.0300	ug/L		02/12/18 06:48	02/16/18 12:50	1
Benzo[b]fluoranthene	ND		0.200	0.0590	ug/L		02/12/18 06:48	02/16/18 12:50	1
Benzo[g,h,i]perylene	ND		0.200	0.0500	ug/L		02/12/18 06:48	02/16/18 12:50	1
Benzo[k]fluoranthene	ND		0.200	0.0480	ug/L		02/12/18 06:48	02/16/18 12:50	1
Chrysene	ND		0.200	0.0350	ug/L		02/12/18 06:48	02/16/18 12:50	1
Dibenz(a,h)anthracene	ND		0.200	0.0400	ug/L		02/12/18 06:48	02/16/18 12:50	1
Fluoranthene	ND		0.200	0.0270	ug/L		02/12/18 06:48	02/16/18 12:50	1
Fluorene	**10.8**		0.200	0.0340	ug/L		02/12/18 06:48	02/16/18 12:50	1
Indeno[1,2,3-cd]pyrene	ND		0.200	0.0480	ug/L		02/12/18 06:48	02/16/18 12:50	1
Naphthalene	**6.64**		0.200	0.0430	ug/L		02/12/18 06:48	02/16/18 12:50	1
Phenanthrene	**3.29**		0.200	0.0310	ug/L		02/12/18 06:48	02/16/18 12:50	1
Pyrene	ND		0.200	0.0280	ug/L		02/12/18 06:48	02/16/18 12:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*80*		*32 - 120*	*02/12/18 06:48*	*02/16/18 12:50*	*1*
2-Fluorophenol (Surr)	*97*		*17 - 120*	*02/12/18 06:48*	*02/16/18 12:50*	*1*
Nitrobenzene-d5 (Surr)	*71*		*35 - 120*	*02/12/18 06:48*	*02/16/18 12:50*	*1*
Phenol-d5 (Surr)	*64*		*15 - 120*	*02/12/18 06:48*	*02/16/18 12:50*	*1*
Terphenyl-d14 (Surr)	*101*		*28 - 128*	*02/12/18 06:48*	*02/16/18 12:50*	*1*
2,4,6-Tribromophenol (Surr)	*94*		*33 - 120*	*02/12/18 06:48*	*02/16/18 12:50*	*1*

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**99.7**		0.800	0.176	ug/L		02/12/18 06:48	02/23/18 10:37	4

Client Sample ID: MW4DR-020718-1420
Date Collected: 02/07/18 14:20
Date Received: 02/10/18 08:00

Lab Sample ID: 240-91369-20
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	128	X	32 - 120	02/12/18 06:48	02/23/18 10:37	4
2-Fluorophenol (Surr)	127	X	17 - 120	02/12/18 06:48	02/23/18 10:37	4
Nitrobenzene-d5 (Surr)	127	X	35 - 120	02/12/18 06:48	02/23/18 10:37	4
Phenol-d5 (Surr)	91		15 - 120	02/12/18 06:48	02/23/18 10:37	4
Terphenyl-d14 (Surr)	153	X	28 - 128	02/12/18 06:48	02/23/18 10:37	4
2,4,6-Tribromophenol (Surr)	114		33 - 120	02/12/18 06:48	02/23/18 10:37	4

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		200	47.3	ug/L		02/12/18 14:00	02/13/18 16:53	1
Arsenic	**339**		10.0	4.05	ug/L		02/12/18 14:00	02/13/18 16:53	1
Barium	**1890**		200	1.33	ug/L		02/12/18 14:00	02/13/18 16:53	1
Beryllium	ND	^	4.00	0.601	ug/L		02/12/18 14:00	02/13/18 16:53	1
Cadmium	**22.4**		2.00	0.203	ug/L		02/12/18 14:00	02/13/18 16:53	1
Calcium	**71900**		5000	307	ug/L		02/12/18 14:00	02/13/18 16:53	1
Chromium	**6.29**		5.00	0.625	ug/L		02/12/18 14:00	02/13/18 16:53	1
Cobalt	**23.6**		10.0	0.752	ug/L		02/12/18 14:00	02/13/18 16:53	1
Copper	ND		25.0	3.55	ug/L		02/12/18 14:00	02/13/18 16:53	1
Iron	**4440**		100	26.0	ug/L		02/12/18 14:00	02/13/18 16:53	1
Lead	**102**		5.00	2.77	ug/L		02/12/18 14:00	02/13/18 16:53	1
Magnesium	**44400**		5000	776	ug/L		02/12/18 14:00	02/13/18 16:53	1
Manganese	**72.6**		15.0	2.12	ug/L		02/12/18 14:00	02/13/18 16:53	1
Nickel	**17.9**	**J**	40.0	2.20	ug/L		02/12/18 14:00	02/13/18 16:53	1
Potassium	**17800**		5000	557	ug/L		02/12/18 14:00	02/13/18 16:53	1
Selenium	**208**		15.0	5.96	ug/L		02/12/18 14:00	02/13/18 16:53	1
Silver	ND		5.00	0.623	ug/L		02/12/18 14:00	02/13/18 16:53	1
Sodium	**176000**		5000	560	ug/L		02/12/18 14:00	02/13/18 16:53	1
Vanadium	ND		50.0	5.56	ug/L		02/12/18 14:00	02/13/18 16:53	1
Zinc	**59.7**		50.0	9.67	ug/L		02/12/18 14:00	02/13/18 16:53	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00	0.570	ug/L		02/12/18 14:00	02/13/18 17:22	1
Thallium	ND		1.00	0.200	ug/L		02/12/18 14:00	02/13/18 17:22	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.130	ug/L		02/12/18 14:00	02/13/18 14:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	**0.0552**		0.0100	0.00600	mg/L		02/12/18 12:30	02/12/18 15:11	1

Surrogate Summary

Client: Duke Energy Corporation
Project/Site: East End Gas Works-EAST J18020380

TestAmerica Job ID: 240-91369-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	DCA	TOL
Lab Sample ID	Client Sample ID	(69-120)	(69-124)	(61-138)	(73-120)
240-91339-E-9 MS	Matrix Spike	92	97	95	99
240-91339-F-9 MSD	Matrix Spike Duplicate	92	102	97	99
240-91369-1	MW6-020618-1655	75	103	93	78
240-91369-1 MS	MW6-020618-1655	90	92	83	85
240-91369-1 MSD	MW6-020618-1655	90	91	80	84
240-91369-2	4479-020618-0001	80	103	95	77
240-91369-3	MW8D-020718-1025	81	102	98	77
240-91369-4	MW8S-020718-1230	75	106	98	78
240-91369-5	MW7D-020718-1023	77	101	93	75
240-91369-6	MW7S-020718-1203	76	105	97	78
240-91369-7	MWK09S-020718-1445	83	99	91	79
240-91369-8	MWK09D-020718-1553	79	103	98	81
240-91369-9	4413-020718-0001	77	104	95	79
240-91369-10	MW19S-020818-0929	76	104	94	76
240-91369-11	MW21D-020818-1119	76	102	94	76
240-91369-12	MW25D-020818-1335	90	99	91	77
240-91369-13	MW21S-020818-1430	91	98	95	97
240-91369-14	TW1S-020818-0959	89	91	96	97
240-91369-15	TW2I-020818-1135	84	92	93	95
240-91369-16	MW3DR-020818-1423	91	95	95	98
240-91369-17	MW26S-020818-1620	90	99	92	97
240-91369-18	4479-020818-0001	93	104	91	97
240-91369-19	4413-020818-0001	92	97	91	95
240-91369-20	MW4DR-020718-1420	88	94	99	96
LCS 240-314603/5	Lab Control Sample	92	93	85	83
LCS 240-314918/4	Lab Control Sample	91	101	103	98
MB 240-314603/7	Method Blank	79	105	93	79
MB 240-314918/6	Method Blank	84	93	93	95

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	NBZ	PHL	TPHL	TBP
Lab Sample ID	Client Sample ID	(32-120)	(17-120)	(35-120)	(15-120)	(28-128)	(33-120)
240-91369-1	MW6-020618-1655	52	56	57	35	61	56
240-91369-1 MS	MW6-020618-1655	76	75	82	58	70	84
240-91369-1 MSD	MW6-020618-1655	71	78	77	48	67	81
240-91369-3	MW8D-020718-1025	64	59	72	44	86	66
240-91369-4	MW8S-020718-1230	63	59	68	45	83	64
240-91369-5	MW7D-020718-1023	64	67	71	43	79	64
240-91369-6	MW7S-020718-1203	63	55	66	45	79	67
240-91369-7	MWK09S-020718-1445	62	61	67	39	72	68

Surrogate Summary

Client: Duke Energy Corporation
Project/Site: East End Gas Works-EAST J18020380

TestAmerica Job ID: 240-91369-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	FBP (32-120)	2FP (17-120)	NBZ (35-120)	PHL (15-120)	TPHL (28-128)	TBP (33-120)
240-91369-8	MWK09D-020718-1553	63	60	68	44	85	67
240-91369-9	4413-020718-0001	63	65	70	44	77	68
240-91369-10	MW19S-020818-0929	53	54	56	40	81	56
240-91369-11	MW21D-020818-1119	64	70	69	50	94	72
240-91369-12	MW25D-020818-1335	67	66	70	46	87	58
240-91369-13	MW21S-020818-1430	72	68	81	47	77	79
240-91369-14	TW1S-020818-0959	82	71	74	47	107	74
240-91369-15	TW2I-020818-1135	60	60	64	42	80	68
240-91369-16	MW3DR-020818-1423	61	81	73	50	75	70
240-91369-16 - RA	MW3DR-020818-1423	68	64	60	33	74	45
240-91369-17	MW26S-020818-1620	60	42	65	36	78	61
240-91369-18	4479-020818-0001	62	71	68	47	91	67
240-91369-19	4413-020818-0001	62	72	67	47	95	71
240-91369-20	MW4DR-020718-1420	80	97	71	64	101	94
240-91369-20 - RA	MW4DR-020718-1420	128 X	127 X	127 X	91	153 X	114
LCS 240-314344/23-A	Lab Control Sample	76	51	82	29	79	76
MB 240-314344/22-A	Method Blank	58	36	60	22	89	58

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)
TBP = 2,4,6-Tribromophenol (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-314603/7
Matrix: Water
Analysis Batch: 314603

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		10.0	1.76	ug/L			02/13/18 15:53	1
Benzene	ND		1.00	0.280	ug/L			02/13/18 15:53	1
Bromobenzene	ND		1.00	0.310	ug/L			02/13/18 15:53	1
Bromochloromethane	ND		1.00	0.470	ug/L			02/13/18 15:53	1
Bromodichloromethane	ND		1.00	0.300	ug/L			02/13/18 15:53	1
Bromoform	ND		1.00	0.430	ug/L			02/13/18 15:53	1
Bromomethane	ND		1.00	0.420	ug/L			02/13/18 15:53	1
2-Butanone (MEK)	ND		10.0	1.02	ug/L			02/13/18 15:53	1
Carbon disulfide	ND		1.00	0.340	ug/L			02/13/18 15:53	1
Carbon tetrachloride	ND		1.00	0.350	ug/L			02/13/18 15:53	1
Chlorobenzene	ND		1.00	0.320	ug/L			02/13/18 15:53	1
Chlorodibromomethane	ND		1.00	0.250	ug/L			02/13/18 15:53	1
Chloroethane	ND		1.00	0.410	ug/L			02/13/18 15:53	1
Chloroform	ND		1.00	0.310	ug/L			02/13/18 15:53	1
Chloromethane	ND		1.00	0.430	ug/L			02/13/18 15:53	1
2-Chlorotoluene	ND		1.00	0.280	ug/L			02/13/18 15:53	1
4-Chlorotoluene	ND		1.00	0.230	ug/L			02/13/18 15:53	1
cis-1,2-Dichloroethene	ND		1.00	0.300	ug/L			02/13/18 15:53	1
cis-1,3-Dichloropropene	ND		1.00	0.260	ug/L			02/13/18 15:53	1
1,2-Dibromoethane (EDB)	ND		1.00	0.230	ug/L			02/13/18 15:53	1
Dibromomethane	ND		1.00	0.460	ug/L			02/13/18 15:53	1
1,2-Dichlorobenzene	ND		1.00	0.260	ug/L			02/13/18 15:53	1
1,3-Dichlorobenzene	ND		1.00	0.320	ug/L			02/13/18 15:53	1
1,4-Dichlorobenzene	ND		1.00	0.230	ug/L			02/13/18 15:53	1
Dichlorodifluoromethane	ND		1.00	0.500	ug/L			02/13/18 15:53	1
1,1-Dichloroethane	ND		1.00	0.250	ug/L			02/13/18 15:53	1
1,2-Dichloroethane	ND		1.00	0.300	ug/L			02/13/18 15:53	1
1,1-Dichloroethene	ND		1.00	0.270	ug/L			02/13/18 15:53	1
1,2-Dichloropropane	ND		1.00	0.300	ug/L			02/13/18 15:53	1
1,3-Dichloropropane	ND		1.00	0.290	ug/L			02/13/18 15:53	1
2,2-Dichloropropane	ND		1.00	0.340	ug/L			02/13/18 15:53	1
1,1-Dichloropropene	ND		1.00	0.280	ug/L			02/13/18 15:53	1
Ethylbenzene	ND		1.00	0.260	ug/L			02/13/18 15:53	1
Hexachlorobutadiene	0.4175	J	1.00	0.360	ug/L			02/13/18 15:53	1
2-Hexanone	ND		10.0	1.23	ug/L			02/13/18 15:53	1
Isopropylbenzene	ND		1.00	0.210	ug/L			02/13/18 15:53	1
Methylene Chloride	0.7428	J	1.00	0.530	ug/L			02/13/18 15:53	1
4-Methyl-2-pentanone (MIBK)	ND		10.0	0.710	ug/L			02/13/18 15:53	1
Methyl tert-butyl ether	ND		1.00	0.270	ug/L			02/13/18 15:53	1
Naphthalene	ND		1.00	0.250	ug/L			02/13/18 15:53	1
n-Butylbenzene	ND		1.00	0.210	ug/L			02/13/18 15:53	1
N-Propylbenzene	ND		1.00	0.450	ug/L			02/13/18 15:53	1
p-Isopropyltoluene	ND		1.00	0.290	ug/L			02/13/18 15:53	1
sec-Butylbenzene	ND		1.00	0.270	ug/L			02/13/18 15:53	1
Styrene	ND		1.00	0.230	ug/L			02/13/18 15:53	1
tert-Butylbenzene	ND		1.00	0.260	ug/L			02/13/18 15:53	1
1,1,1,2-Tetrachloroethane	ND		1.00	0.460	ug/L			02/13/18 15:53	1
1,1,2,2-Tetrachloroethane	ND		1.00	0.320	ug/L			02/13/18 15:53	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-314603/7
Matrix: Water
Analysis Batch: 314603

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	ND		1.00	0.300	ug/L			02/13/18 15:53	1
Toluene	ND		1.00	0.230	ug/L			02/13/18 15:53	1
trans-1,2-Dichloroethene	ND		1.00	0.290	ug/L			02/13/18 15:53	1
trans-1,3-Dichloropropene	ND		1.00	0.310	ug/L			02/13/18 15:53	1
1,2,3-Trichlorobenzene	ND		1.00	0.350	ug/L			02/13/18 15:53	1
1,2,4-Trichlorobenzene	ND		1.00	0.270	ug/L			02/13/18 15:53	1
1,1,1-Trichloroethane	ND		1.00	0.230	ug/L			02/13/18 15:53	1
1,1,2-Trichloroethane	ND		1.00	0.340	ug/L			02/13/18 15:53	1
Trichloroethene	ND		1.00	0.330	ug/L			02/13/18 15:53	1
Trichlorofluoromethane	ND		1.00	0.500	ug/L			02/13/18 15:53	1
1,2,3-Trichloropropane	ND		1.00	0.540	ug/L			02/13/18 15:53	1
1,2,4-Trimethylbenzene	ND		1.00	0.240	ug/L			02/13/18 15:53	1
1,3,5-Trimethylbenzene	ND		1.00	0.240	ug/L			02/13/18 15:53	1
Vinyl chloride	ND		1.00	0.450	ug/L			02/13/18 15:53	1
Xylenes, Total	ND		2.00	0.240	ug/L			02/13/18 15:53	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*79*		*69 - 120*		*02/13/18 15:53*	*1*
Dibromofluoromethane (Surr)	*105*		*69 - 124*		*02/13/18 15:53*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*61 - 138*		*02/13/18 15:53*	*1*
Toluene-d8 (Surr)	*79*		*73 - 120*		*02/13/18 15:53*	*1*

Lab Sample ID: LCS 240-314603/5
Matrix: Water
Analysis Batch: 314603

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	25.02		ug/L		125	35 - 131
Benzene	10.0	10.95		ug/L		110	79 - 120
Bromobenzene	10.0	10.57		ug/L		106	73 - 120
Bromochloromethane	10.0	12.21	*	ug/L		122	78 - 120
Bromodichloromethane	10.0	12.04		ug/L		120	79 - 125
Bromoform	10.0	13.16		ug/L		132	55 - 145
Bromomethane	10.0	12.47		ug/L		125	17 - 158
2-Butanone (MEK)	20.0	32.80	*	ug/L		164	43 - 149
Carbon disulfide	10.0	11.48		ug/L		115	49 - 141
Carbon tetrachloride	10.0	14.21		ug/L		142	55 - 171
Chlorobenzene	10.0	11.20		ug/L		112	80 - 120
Chlorodibromomethane	10.0	13.14	*	ug/L		131	64 - 129
Chloroethane	10.0	9.660		ug/L		97	10 - 149
Chloroform	10.0	11.49		ug/L		115	80 - 120
Chloromethane	10.0	9.331		ug/L		93	59 - 124
2-Chlorotoluene	10.0	10.32		ug/L		103	80 - 120
4-Chlorotoluene	10.0	10.27		ug/L		103	79 - 120
cis-1,2-Dichloroethene	10.0	11.45		ug/L		114	77 - 120
cis-1,3-Dichloropropene	10.0	9.931		ug/L		99	75 - 120
1,2-Dibromoethane (EDB)	10.0	11.98		ug/L		120	80 - 120
Dibromomethane	10.0	10.78		ug/L		108	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-314603/5
Matrix: Water
Analysis Batch: 314603

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichlorobenzene	10.0	10.11		ug/L		101	80 - 120
1,3-Dichlorobenzene	10.0	10.09		ug/L		101	80 - 120
1,4-Dichlorobenzene	10.0	10.15		ug/L		101	80 - 120
Dichlorodifluoromethane	10.0	13.89		ug/L		139	42 - 141
1,1-Dichloroethane	10.0	11.63		ug/L		116	74 - 120
1,2-Dichloroethane	10.0	11.85		ug/L		119	68 - 133
1,1-Dichloroethene	10.0	11.69		ug/L		117	65 - 127
1,2-Dichloropropane	10.0	11.70		ug/L		117	78 - 127
1,3-Dichloropropane	10.0	11.36		ug/L		114	71 - 124
2,2-Dichloropropane	10.0	11.25		ug/L		113	32 - 178
1,1-Dichloropropene	10.0	11.61		ug/L		116	80 - 122
Ethylbenzene	10.0	10.95		ug/L		109	80 - 120
Hexachlorobutadiene	10.0	9.147		ug/L		91	36 - 146
2-Hexanone	20.0	29.27		ug/L		146	28 - 169
Isopropylbenzene	10.0	10.70		ug/L		107	80 - 128
Methylene Chloride	10.0	12.79		ug/L		128	64 - 140
4-Methyl-2-pentanone (MIBK)	20.0	24.82		ug/L		124	53 - 144
Methyl tert-butyl ether	10.0	8.253		ug/L		83	73 - 120
Naphthalene	10.0	6.766		ug/L		68	31 - 127
n-Butylbenzene	10.0	8.677		ug/L		87	60 - 137
N-Propylbenzene	10.0	10.20		ug/L		102	76 - 120
p-Isopropyltoluene	10.0	9.885		ug/L		99	78 - 125
sec-Butylbenzene	10.0	9.728		ug/L		97	76 - 124
Styrene	10.0	11.62		ug/L		116	80 - 121
tert-Butylbenzene	10.0	9.790		ug/L		98	79 - 120
1,1,1,2-Tetrachloroethane	10.0	11.66		ug/L		117	73 - 136
1,1,2,2-Tetrachloroethane	10.0	11.51		ug/L		115	58 - 122
Tetrachloroethene	10.0	12.05		ug/L		121	80 - 122
Toluene	10.0	11.06		ug/L		111	78 - 120
trans-1,2-Dichloroethene	10.0	12.42		ug/L		124	74 - 124
trans-1,3-Dichloropropene	10.0	9.914		ug/L		99	67 - 120
1,2,3-Trichlorobenzene	10.0	7.982		ug/L		80	31 - 144
1,2,4-Trichlorobenzene	10.0	7.197		ug/L		72	34 - 141
1,1,1-Trichloroethane	10.0	12.31		ug/L		123	64 - 147
1,1,2-Trichloroethane	10.0	12.04		ug/L		120	76 - 121
Trichloroethene	10.0	11.47		ug/L		115	76 - 124
Trichlorofluoromethane	10.0	17.36		ug/L		174	27 - 176
1,2,3-Trichloropropane	10.0	12.09		ug/L		121	53 - 134
1,2,4-Trimethylbenzene	10.0	10.25		ug/L		102	80 - 120
1,3,5-Trimethylbenzene	10.0	10.63		ug/L		106	79 - 120
Vinyl chloride	10.0	9.590		ug/L		96	65 - 124
Xylenes, Total	20.0	21.69		ug/L		108	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*92*		*69 - 120*
Dibromofluoromethane (Surr)	*93*		*69 - 124*
1,2-Dichloroethane-d4 (Surr)	*85*		*61 - 138*
Toluene-d8 (Surr)	*83*		*73 - 120*

QC Sample Results

Client: Duke Energy Corporation
Project/Site: East End Gas Works-EAST J18020380

TestAmerica Job ID: 240-91369-1

Lab Sample ID: 240-91369-1 MS
Matrix: Water
Analysis Batch: 314603

Client Sample ID: MW6-020618-1655
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	ND		20.0	20.09		ug/L		100	19 - 133
Benzene	ND		10.0	10.00		ug/L		100	69 - 127
Bromobenzene	ND		10.0	8.883		ug/L		89	59 - 131
Bromochloromethane	ND	*	10.0	11.44		ug/L		114	66 - 132
Bromodichloromethane	ND		10.0	10.49		ug/L		105	75 - 128
Bromoform	ND		10.0	11.49		ug/L		115	61 - 135
Bromomethane	ND	F1	10.0	16.23	F1	ug/L		162	10 - 148
2-Butanone (MEK)	ND	*	20.0	24.07		ug/L		120	34 - 153
Carbon disulfide	ND		10.0	11.33		ug/L		113	46 - 143
Carbon tetrachloride	ND		10.0	12.98		ug/L		130	53 - 175
Chlorobenzene	ND		10.0	10.29		ug/L		103	76 - 120
Chlorodibromomethane	ND	*	10.0	11.63		ug/L		116	62 - 131
Chloroethane	ND		10.0	12.82		ug/L		128	10 - 141
Chloroform	ND		10.0	10.75		ug/L		107	74 - 125
Chloromethane	ND		10.0	9.193		ug/L		92	34 - 127
2-Chlorotoluene	ND		10.0	8.484		ug/L		85	52 - 134
4-Chlorotoluene	ND		10.0	8.425		ug/L		84	52 - 133
cis-1,2-Dichloroethene	ND		10.0	10.93		ug/L		109	69 - 127
cis-1,3-Dichloropropene	ND		10.0	8.284		ug/L		83	68 - 120
1,2-Dibromoethane (EDB)	ND		10.0	10.65		ug/L		107	73 - 121
Dibromomethane	ND		10.0	9.922		ug/L		99	73 - 120
1,2-Dichlorobenzene	ND		10.0	9.080		ug/L		91	70 - 120
1,3-Dichlorobenzene	ND		10.0	8.866		ug/L		89	71 - 120
1,4-Dichlorobenzene	ND		10.0	9.024		ug/L		90	72 - 120
Dichlorodifluoromethane	ND		10.0	11.63		ug/L		116	45 - 130
1,1-Dichloroethane	ND		10.0	10.72		ug/L		107	69 - 122
1,2-Dichloroethane	ND		10.0	10.81		ug/L		108	64 - 138
1,1-Dichloroethene	ND		10.0	10.85		ug/L		108	62 - 127
1,2-Dichloropropane	ND		10.0	10.41		ug/L		104	72 - 131
1,3-Dichloropropane	ND		10.0	10.07		ug/L		101	58 - 137
2,2-Dichloropropane	ND		10.0	9.753		ug/L		98	34 - 153
1,1-Dichloropropene	ND		10.0	9.972		ug/L		100	55 - 136
Ethylbenzene	ND		10.0	9.716		ug/L		97	72 - 121
Hexachlorobutadiene	ND		10.0	8.835		ug/L		88	30 - 134
2-Hexanone	ND		20.0	21.51		ug/L		108	21 - 184
Isopropylbenzene	ND		10.0	9.358		ug/L		94	70 - 132
Methylene Chloride	ND		10.0	10.66		ug/L		107	52 - 137
4-Methyl-2-pentanone (MIBK)	ND		20.0	18.80		ug/L		94	53 - 147
Methyl tert-butyl ether	ND		10.0	6.831		ug/L		68	67 - 125
Naphthalene	0.663	J	10.0	6.513		ug/L		59	28 - 150
n-Butylbenzene	ND		10.0	7.153		ug/L		72	38 - 133
N-Propylbenzene	ND		10.0	8.081		ug/L		81	50 - 134
p-Isopropyltoluene	ND		10.0	8.279		ug/L		83	70 - 120
sec-Butylbenzene	ND		10.0	7.711		ug/L		77	43 - 133
Styrene	ND		10.0	10.23		ug/L		102	74 - 125
tert-Butylbenzene	ND		10.0	8.100		ug/L		81	48 - 131
1,1,1,2-Tetrachloroethane	ND		10.0	11.13		ug/L		111	67 - 142
1,1,2,2-Tetrachloroethane	ND		10.0	8.849		ug/L		88	51 - 123
Tetrachloroethene	ND		10.0	10.72		ug/L		107	69 - 126
Toluene	ND		10.0	10.12		ug/L		101	69 - 125

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-91369-1 MS
Matrix: Water
Analysis Batch: 314603

Client Sample ID: MW6-020618-1655
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
trans-1,2-Dichloroethene	ND		10.0	11.39		ug/L		114	66 - 131
trans-1,3-Dichloropropene	ND		10.0	8.388		ug/L		84	59 - 120
1,2,3-Trichlorobenzene	ND		10.0	7.879		ug/L		79	40 - 139
1,2,4-Trichlorobenzene	ND		10.0	7.316		ug/L		73	26 - 138
1,1,1-Trichloroethane	ND		10.0	10.92		ug/L		109	57 - 156
1,1,2-Trichloroethane	ND		10.0	10.80		ug/L		108	68 - 127
Trichloroethene	ND		10.0	10.19		ug/L		102	68 - 129
Trichlorofluoromethane	ND		10.0	16.88		ug/L		169	28 - 172
1,2,3-Trichloropropane	ND		10.0	9.373		ug/L		94	41 - 152
1,2,4-Trimethylbenzene	ND		10.0	8.647		ug/L		86	64 - 120
1,3,5-Trimethylbenzene	ND		10.0	8.671		ug/L		87	67 - 120
Vinyl chloride	ND	F2	10.0	7.859		ug/L		79	55 - 123
Xylenes, Total	ND		20.0	19.42		ug/L		97	71 - 122

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*90*		*69 - 120*
Dibromofluoromethane (Surr)	*92*		*69 - 124*
1,2-Dichloroethane-d4 (Surr)	*83*		*61 - 138*
Toluene-d8 (Surr)	*85*		*73 - 120*

Lab Sample ID: 240-91369-1 MSD
Matrix: Water
Analysis Batch: 314603

Client Sample ID: MW6-020618-1655
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	ND		20.0	19.21		ug/L		96	19 - 133	4	35
Benzene	ND		10.0	9.941		ug/L		99	69 - 127	1	10
Bromobenzene	ND		10.0	8.861		ug/L		89	59 - 131	0	35
Bromochloromethane	ND	*	10.0	10.80		ug/L		108	66 - 132	6	15
Bromodichloromethane	ND		10.0	10.76		ug/L		108	75 - 128	3	13
Bromoform	ND		10.0	11.00		ug/L		110	61 - 135	4	13
Bromomethane	ND	F1	10.0	18.09	F1	ug/L		181	10 - 148	11	35
2-Butanone (MEK)	ND	*	20.0	23.37		ug/L		117	34 - 153	3	23
Carbon disulfide	ND		10.0	11.03		ug/L		110	46 - 143	3	18
Carbon tetrachloride	ND		10.0	12.41		ug/L		124	53 - 175	4	17
Chlorobenzene	ND		10.0	10.26		ug/L		103	76 - 120	0	12
Chlorodibromomethane	ND	*	10.0	11.66		ug/L		117	62 - 131	0	15
Chloroethane	ND		10.0	14.07		ug/L		141	10 - 141	9	35
Chloroform	ND		10.0	10.72		ug/L		107	74 - 125	0	11
Chloromethane	ND		10.0	9.483		ug/L		95	34 - 127	3	25
2-Chlorotoluene	ND		10.0	8.622		ug/L		86	52 - 134	2	35
4-Chlorotoluene	ND		10.0	8.845		ug/L		88	52 - 133	5	35
cis-1,2-Dichloroethene	ND		10.0	10.53		ug/L		105	69 - 127	4	11
cis-1,3-Dichloropropene	ND		10.0	8.492		ug/L		85	68 - 120	2	13
1,2-Dibromoethane (EDB)	ND		10.0	10.19		ug/L		102	73 - 121	4	12
Dibromomethane	ND		10.0	9.777		ug/L		98	73 - 120	1	16
1,2-Dichlorobenzene	ND		10.0	9.568		ug/L		96	70 - 120	5	19
1,3-Dichlorobenzene	ND		10.0	8.946		ug/L		89	71 - 120	1	18

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-91369-1 MSD
Matrix: Water
Analysis Batch: 314603

Client Sample ID: MW6-020618-1655
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dichlorobenzene	ND		10.0	9.308		ug/L		93	72 - 120	3	17
Dichlorodifluoromethane	ND		10.0	12.11		ug/L		121	45 - 130	4	34
1,1-Dichloroethane	ND		10.0	10.47		ug/L		105	69 - 122	2	11
1,2-Dichloroethane	ND		10.0	10.38		ug/L		104	64 - 138	4	11
1,1-Dichloroethene	ND		10.0	10.76		ug/L		108	62 - 127	1	14
1,2-Dichloropropane	ND		10.0	10.75		ug/L		107	72 - 131	3	12
1,3-Dichloropropane	ND		10.0	9.840		ug/L		98	58 - 137	2	35
2,2-Dichloropropane	ND		10.0	12.01		ug/L		120	34 - 153	21	35
1,1-Dichloropropene	ND		10.0	9.722		ug/L		97	55 - 136	3	35
Ethylbenzene	ND		10.0	9.572		ug/L		96	72 - 121	1	15
Hexachlorobutadiene	ND		10.0	9.664		ug/L		97	30 - 134	9	35
2-Hexanone	ND		20.0	20.80		ug/L		104	21 - 184	3	12
Isopropylbenzene	ND		10.0	8.904		ug/L		89	70 - 132	5	16
Methylene Chloride	ND		10.0	10.08		ug/L		101	52 - 137	6	12
4-Methyl-2-pentanone (MIBK)	ND		20.0	17.56		ug/L		88	53 - 147	7	16
Methyl tert-butyl ether	ND		10.0	6.758		ug/L		68	67 - 125	1	12
Naphthalene	0.663	J	10.0	6.638		ug/L		60	28 - 150	2	35
n-Butylbenzene	ND		10.0	7.591		ug/L		76	38 - 133	6	35
N-Propylbenzene	ND		10.0	8.120		ug/L		81	50 - 134	0	35
p-Isopropyltoluene	ND		10.0	8.595		ug/L		86	70 - 120	4	22
sec-Butylbenzene	ND		10.0	8.004		ug/L		80	43 - 133	4	35
Styrene	ND		10.0	9.926		ug/L		99	74 - 125	3	14
tert-Butylbenzene	ND		10.0	8.032		ug/L		80	48 - 131	1	35
1,1,1,2-Tetrachloroethane	ND		10.0	10.94		ug/L		109	67 - 142	2	18
1,1,2,2-Tetrachloroethane	ND		10.0	8.457		ug/L		85	51 - 123	5	17
Tetrachloroethene	ND		10.0	10.37		ug/L		104	69 - 126	3	18
Toluene	ND		10.0	9.857		ug/L		99	69 - 125	3	14
trans-1,2-Dichloroethene	ND		10.0	11.06		ug/L		111	66 - 131	3	11
trans-1,3-Dichloropropene	ND		10.0	8.129		ug/L		81	59 - 120	3	14
1,2,3-Trichlorobenzene	ND		10.0	8.903		ug/L		89	40 - 139	12	35
1,2,4-Trichlorobenzene	ND		10.0	7.898		ug/L		79	26 - 138	8	35
1,1,1-Trichloroethane	ND		10.0	10.78		ug/L		108	57 - 156	1	13
1,1,2-Trichloroethane	ND		10.0	10.40		ug/L		104	68 - 127	4	11
Trichloroethene	ND		10.0	9.936		ug/L		99	68 - 129	3	12
Trichlorofluoromethane	ND		10.0	17.04		ug/L		170	28 - 172	1	26
1,2,3-Trichloropropane	ND		10.0	8.837		ug/L		88	41 - 152	6	12
1,2,4-Trimethylbenzene	ND		10.0	8.794		ug/L		88	64 - 120	2	22
1,3,5-Trimethylbenzene	ND		10.0	8.972		ug/L		90	67 - 120	3	25
Vinyl chloride	ND	F2	10.0	8.951	F2	ug/L		90	55 - 123	13	12
Xylenes, Total	ND		20.0	18.85		ug/L		94	71 - 122	3	14

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*90*		*69 - 120*
Dibromofluoromethane (Surr)	*91*		*69 - 124*
1,2-Dichloroethane-d4 (Surr)	*80*		*61 - 138*
Toluene-d8 (Surr)	*84*		*73 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-314918/6
Matrix: Water
Analysis Batch: 314918

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		10.0	1.76	ug/L			02/15/18 14:28	1
Benzene	ND		1.00	0.280	ug/L			02/15/18 14:28	1
Bromobenzene	ND		1.00	0.310	ug/L			02/15/18 14:28	1
Bromochloromethane	ND		1.00	0.470	ug/L			02/15/18 14:28	1
Bromodichloromethane	ND		1.00	0.300	ug/L			02/15/18 14:28	1
Bromoform	ND		1.00	0.430	ug/L			02/15/18 14:28	1
Bromomethane	ND		1.00	0.420	ug/L			02/15/18 14:28	1
2-Butanone (MEK)	ND		10.0	1.02	ug/L			02/15/18 14:28	1
Carbon disulfide	ND		1.00	0.340	ug/L			02/15/18 14:28	1
Carbon tetrachloride	ND		1.00	0.350	ug/L			02/15/18 14:28	1
Chlorobenzene	ND		1.00	0.320	ug/L			02/15/18 14:28	1
Chlorodibromomethane	ND		1.00	0.250	ug/L			02/15/18 14:28	1
Chloroethane	ND		1.00	0.410	ug/L			02/15/18 14:28	1
Chloroform	ND		1.00	0.310	ug/L			02/15/18 14:28	1
Chloromethane	ND		1.00	0.430	ug/L			02/15/18 14:28	1
2-Chlorotoluene	ND		1.00	0.280	ug/L			02/15/18 14:28	1
4-Chlorotoluene	ND		1.00	0.230	ug/L			02/15/18 14:28	1
cis-1,2-Dichloroethene	ND		1.00	0.300	ug/L			02/15/18 14:28	1
cis-1,3-Dichloropropene	ND		1.00	0.260	ug/L			02/15/18 14:28	1
1,2-Dibromoethane (EDB)	ND		1.00	0.230	ug/L			02/15/18 14:28	1
Dibromomethane	ND		1.00	0.460	ug/L			02/15/18 14:28	1
1,2-Dichlorobenzene	ND		1.00	0.260	ug/L			02/15/18 14:28	1
1,3-Dichlorobenzene	ND		1.00	0.320	ug/L			02/15/18 14:28	1
1,4-Dichlorobenzene	ND		1.00	0.230	ug/L			02/15/18 14:28	1
Dichlorodifluoromethane	ND		1.00	0.500	ug/L			02/15/18 14:28	1
1,1-Dichloroethane	ND		1.00	0.250	ug/L			02/15/18 14:28	1
1,2-Dichloroethane	ND		1.00	0.300	ug/L			02/15/18 14:28	1
1,1-Dichloroethene	ND		1.00	0.270	ug/L			02/15/18 14:28	1
1,2-Dichloropropane	ND		1.00	0.300	ug/L			02/15/18 14:28	1
1,3-Dichloropropane	ND		1.00	0.290	ug/L			02/15/18 14:28	1
2,2-Dichloropropane	ND		1.00	0.340	ug/L			02/15/18 14:28	1
1,1-Dichloropropene	ND		1.00	0.280	ug/L			02/15/18 14:28	1
Ethylbenzene	ND		1.00	0.260	ug/L			02/15/18 14:28	1
Hexachlorobutadiene	ND		1.00	0.360	ug/L			02/15/18 14:28	1
2-Hexanone	ND		10.0	1.23	ug/L			02/15/18 14:28	1
Isopropylbenzene	ND		1.00	0.210	ug/L			02/15/18 14:28	1
Methylene Chloride	0.6724	J	1.00	0.530	ug/L			02/15/18 14:28	1
4-Methyl-2-pentanone (MIBK)	ND		10.0	0.710	ug/L			02/15/18 14:28	1
Methyl tert-butyl ether	ND		1.00	0.270	ug/L			02/15/18 14:28	1
Naphthalene	ND		1.00	0.250	ug/L			02/15/18 14:28	1
n-Butylbenzene	ND		1.00	0.210	ug/L			02/15/18 14:28	1
N-Propylbenzene	ND		1.00	0.450	ug/L			02/15/18 14:28	1
p-Isopropyltoluene	ND		1.00	0.290	ug/L			02/15/18 14:28	1
sec-Butylbenzene	ND		1.00	0.270	ug/L			02/15/18 14:28	1
Styrene	ND		1.00	0.230	ug/L			02/15/18 14:28	1
tert-Butylbenzene	ND		1.00	0.260	ug/L			02/15/18 14:28	1
1,1,1,2-Tetrachloroethane	ND		1.00	0.460	ug/L			02/15/18 14:28	1
1,1,2,2-Tetrachloroethane	ND		1.00	0.320	ug/L			02/15/18 14:28	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-314918/6
Matrix: Water
Analysis Batch: 314918

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	ND		1.00	0.300	ug/L			02/15/18 14:28	1
Toluene	ND		1.00	0.230	ug/L			02/15/18 14:28	1
trans-1,2-Dichloroethene	ND		1.00	0.290	ug/L			02/15/18 14:28	1
trans-1,3-Dichloropropene	ND		1.00	0.310	ug/L			02/15/18 14:28	1
1,2,3-Trichlorobenzene	ND		1.00	0.350	ug/L			02/15/18 14:28	1
1,2,4-Trichlorobenzene	ND		1.00	0.270	ug/L			02/15/18 14:28	1
1,1,1-Trichloroethane	ND		1.00	0.230	ug/L			02/15/18 14:28	1
1,1,2-Trichloroethane	ND		1.00	0.340	ug/L			02/15/18 14:28	1
Trichloroethene	ND		1.00	0.330	ug/L			02/15/18 14:28	1
Trichlorofluoromethane	ND		1.00	0.500	ug/L			02/15/18 14:28	1
1,2,3-Trichloropropane	ND		1.00	0.540	ug/L			02/15/18 14:28	1
1,2,4-Trimethylbenzene	ND		1.00	0.240	ug/L			02/15/18 14:28	1
1,3,5-Trimethylbenzene	ND		1.00	0.240	ug/L			02/15/18 14:28	1
Vinyl chloride	ND		1.00	0.450	ug/L			02/15/18 14:28	1
Xylenes, Total	ND		2.00	0.240	ug/L			02/15/18 14:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*84*		*69 - 120*		*02/15/18 14:28*	*1*
Dibromofluoromethane (Surr)	*93*		*69 - 124*		*02/15/18 14:28*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*61 - 138*		*02/15/18 14:28*	*1*
Toluene-d8 (Surr)	*95*		*73 - 120*		*02/15/18 14:28*	*1*

Lab Sample ID: LCS 240-314918/4
Matrix: Water
Analysis Batch: 314918

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	13.72		ug/L		69	35 - 131
Benzene	10.0	9.448		ug/L		94	79 - 120
Bromobenzene	10.0	9.710		ug/L		97	73 - 120
Bromochloromethane	10.0	10.61		ug/L		106	78 - 120
Bromodichloromethane	10.0	9.893		ug/L		99	79 - 125
Bromoform	10.0	8.728		ug/L		87	55 - 145
Bromomethane	10.0	10.85		ug/L		108	17 - 158
2-Butanone (MEK)	20.0	17.25		ug/L		86	43 - 149
Carbon disulfide	10.0	10.75		ug/L		107	49 - 141
Carbon tetrachloride	10.0	11.64		ug/L		116	55 - 171
Chlorobenzene	10.0	10.40		ug/L		104	80 - 120
Chlorodibromomethane	10.0	9.819		ug/L		98	64 - 129
Chloroethane	10.0	5.324		ug/L		53	10 - 149
Chloroform	10.0	10.83		ug/L		108	80 - 120
Chloromethane	10.0	8.074		ug/L		81	59 - 124
2-Chlorotoluene	10.0	9.985		ug/L		100	80 - 120
4-Chlorotoluene	10.0	9.868		ug/L		99	79 - 120
cis-1,2-Dichloroethene	10.0	10.55		ug/L		106	77 - 120
cis-1,3-Dichloropropene	10.0	8.826		ug/L		88	75 - 120
1,2-Dibromoethane (EDB)	10.0	9.049		ug/L		90	80 - 120
Dibromomethane	10.0	10.36		ug/L		104	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-314918/4
Matrix: Water
Analysis Batch: 314918

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichlorobenzene	10.0	9.473		ug/L		95	80 - 120
1,3-Dichlorobenzene	10.0	9.196		ug/L		92	80 - 120
1,4-Dichlorobenzene	10.0	9.259		ug/L		93	80 - 120
Dichlorodifluoromethane	10.0	9.633		ug/L		96	42 - 141
1,1-Dichloroethane	10.0	10.48		ug/L		105	74 - 120
1,2-Dichloroethane	10.0	11.15		ug/L		111	68 - 133
1,1-Dichloroethene	10.0	10.87		ug/L		109	65 - 127
1,2-Dichloropropane	10.0	9.127		ug/L		91	78 - 127
1,3-Dichloropropane	10.0	9.182		ug/L		92	71 - 124
2,2-Dichloropropane	10.0	10.76		ug/L		108	32 - 178
1,1-Dichloropropene	10.0	10.40		ug/L		104	80 - 122
Ethylbenzene	10.0	10.07		ug/L		101	80 - 120
Hexachlorobutadiene	10.0	6.970		ug/L		70	36 - 146
2-Hexanone	20.0	15.97		ug/L		80	28 - 169
Isopropylbenzene	10.0	10.45		ug/L		104	80 - 128
Methylene Chloride	10.0	10.43		ug/L		104	64 - 140
4-Methyl-2-pentanone (MIBK)	20.0	16.24		ug/L		81	53 - 144
Methyl tert-butyl ether	10.0	9.554		ug/L		96	73 - 120
Naphthalene	10.0	7.226		ug/L		72	31 - 127
n-Butylbenzene	10.0	8.967		ug/L		90	60 - 137
N-Propylbenzene	10.0	10.19		ug/L		102	76 - 120
p-Isopropyltoluene	10.0	9.636		ug/L		96	78 - 125
sec-Butylbenzene	10.0	9.371		ug/L		94	76 - 124
Styrene	10.0	9.659		ug/L		97	80 - 121
tert-Butylbenzene	10.0	9.249		ug/L		92	79 - 120
1,1,1,2-Tetrachloroethane	10.0	10.88		ug/L		109	73 - 136
1,1,2,2-Tetrachloroethane	10.0	8.649		ug/L		86	58 - 122
Tetrachloroethene	10.0	10.10		ug/L		101	80 - 122
Toluene	10.0	9.726		ug/L		97	78 - 120
trans-1,2-Dichloroethene	10.0	10.92		ug/L		109	74 - 124
trans-1,3-Dichloropropene	10.0	8.154		ug/L		82	67 - 120
1,2,3-Trichlorobenzene	10.0	7.499		ug/L		75	31 - 144
1,2,4-Trichlorobenzene	10.0	8.185		ug/L		82	34 - 141
1,1,1-Trichloroethane	10.0	11.64		ug/L		116	64 - 147
1,1,2-Trichloroethane	10.0	9.293		ug/L		93	76 - 121
Trichloroethene	10.0	10.49		ug/L		105	76 - 124
Trichlorofluoromethane	10.0	15.68		ug/L		157	27 - 176
1,2,3-Trichloropropane	10.0	8.703		ug/L		87	53 - 134
1,2,4-Trimethylbenzene	10.0	9.446		ug/L		94	80 - 120
1,3,5-Trimethylbenzene	10.0	9.536		ug/L		95	79 - 120
Vinyl chloride	10.0	9.570		ug/L		96	65 - 124
Xylenes, Total	20.0	20.35		ug/L		102	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*91*		*69 - 120*
Dibromofluoromethane (Surr)	*101*		*69 - 124*
1,2-Dichloroethane-d4 (Surr)	*103*		*61 - 138*
Toluene-d8 (Surr)	*98*		*73 - 120*

QC Sample Results

Client: Duke Energy Corporation
Project/Site: East End Gas Works-EAST J18020380

TestAmerica Job ID: 240-91369-1

Lab Sample ID: 240-91339-E-9 MS
Matrix: Water
Analysis Batch: 314918

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	ND		20.0	11.96		ug/L		60	19 - 133
Benzene	1.95		10.0	10.31		ug/L		84	69 - 127
Bromodichloromethane	ND		10.0	8.920		ug/L		89	75 - 128
Bromoform	ND		10.0	7.689		ug/L		77	61 - 135
Bromomethane	ND		10.0	4.253		ug/L		43	10 - 148
2-Butanone (MEK)	ND		20.0	14.03		ug/L		70	34 - 153
Carbon disulfide	ND		10.0	10.44		ug/L		104	46 - 143
Carbon tetrachloride	ND		10.0	9.799		ug/L		98	53 - 175
Chlorobenzene	ND		10.0	9.574		ug/L		96	76 - 120
Chlorodibromomethane	ND		10.0	8.721		ug/L		87	62 - 131
Chloroethane	ND		10.0	3.708		ug/L		37	10 - 141
Chloroform	ND		10.0	9.858		ug/L		99	74 - 125
Chloromethane	ND	F1	10.0	3.275	F1	ug/L		33	34 - 127
cis-1,2-Dichloroethene	0.444	J	10.0	9.660		ug/L		92	69 - 127
cis-1,3-Dichloropropene	ND		10.0	7.650		ug/L		77	68 - 120
1,2-Dibromoethane (EDB)	ND		10.0	8.993		ug/L		90	73 - 121
1,2-Dichlorobenzene	ND		10.0	8.434		ug/L		84	70 - 120
1,3-Dichlorobenzene	ND		10.0	8.063		ug/L		81	71 - 120
1,4-Dichlorobenzene	ND		10.0	8.335		ug/L		83	72 - 120
Dichlorodifluoromethane	ND		10.0	7.510		ug/L		75	45 - 130
1,1-Dichloroethane	ND		10.0	9.441		ug/L		94	69 - 122
1,2-Dichloroethane	ND		10.0	10.16		ug/L		102	64 - 138
1,1-Dichloroethene	ND		10.0	9.735		ug/L		97	62 - 127
1,2-Dichloropropane	ND		10.0	8.641		ug/L		86	72 - 131
Ethylbenzene	ND		10.0	9.165		ug/L		92	72 - 121
2-Hexanone	ND		20.0	17.84		ug/L		89	21 - 184
Isopropylbenzene	ND		10.0	8.864		ug/L		89	70 - 132
Methylene Chloride	ND		10.0	8.839		ug/L		88	52 - 137
4-Methyl-2-pentanone (MIBK)	ND		20.0	16.26		ug/L		81	53 - 147
Methyl tert-butyl ether	ND		10.0	8.818		ug/L		88	67 - 125
Styrene	ND		10.0	8.688		ug/L		87	74 - 125
1,1,2,2-Tetrachloroethane	ND		10.0	8.352		ug/L		84	51 - 123
Tetrachloroethene	ND		10.0	8.881		ug/L		89	69 - 126
Toluene	ND		10.0	9.229		ug/L		92	69 - 125
trans-1,2-Dichloroethene	ND		10.0	9.682		ug/L		97	66 - 131
trans-1,3-Dichloropropene	ND		10.0	7.381		ug/L		74	59 - 120
1,2,4-Trichlorobenzene	ND		10.0	7.313		ug/L		73	26 - 138
1,1,1-Trichloroethane	ND		10.0	9.921		ug/L		99	57 - 156
1,1,2-Trichloroethane	ND		10.0	9.183		ug/L		92	68 - 127
Trichloroethene	ND		10.0	9.153		ug/L		92	68 - 129
Trichlorofluoromethane	ND		10.0	10.49		ug/L		105	28 - 172
Vinyl chloride	ND	F2	10.0	8.587		ug/L		86	55 - 123
Xylenes, Total	ND		20.0	18.35		ug/L		92	71 - 122

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*92*		*69 - 120*
Dibromofluoromethane (Surr)	*97*		*69 - 124*
1,2-Dichloroethane-d4 (Surr)	*95*		*61 - 138*
Toluene-d8 (Surr)	*99*		*73 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-91339-F-9 MSD
Matrix: Water
Analysis Batch: 314918

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	ND		20.0	9.666	J	ug/L		48	19 - 133	21	35
Benzene	1.95		10.0	10.61		ug/L		87	69 - 127	3	10
Bromodichloromethane	ND		10.0	8.812		ug/L		88	75 - 128	1	13
Bromoform	ND		10.0	7.622		ug/L		76	61 - 135	1	13
Bromomethane	ND		10.0	4.907		ug/L		49	10 - 148	14	35
2-Butanone (MEK)	ND		20.0	13.50		ug/L		68	34 - 153	4	23
Carbon disulfide	ND		10.0	10.50		ug/L		105	46 - 143	1	18
Carbon tetrachloride	ND		10.0	10.06		ug/L		101	53 - 175	3	17
Chlorobenzene	ND		10.0	9.470		ug/L		95	76 - 120	1	12
Chlorodibromomethane	ND		10.0	8.606		ug/L		86	62 - 131	1	15
Chloroethane	ND		10.0	4.845		ug/L		48	10 - 141	27	35
Chloroform	ND		10.0	9.660		ug/L		97	74 - 125	2	11
Chloromethane	ND	F1	10.0	3.962		ug/L		40	34 - 127	19	25
cis-1,2-Dichloroethene	0.444	J	10.0	9.960		ug/L		95	69 - 127	3	11
cis-1,3-Dichloropropene	ND		10.0	7.558		ug/L		76	68 - 120	1	13
1,2-Dibromoethane (EDB)	ND		10.0	8.763		ug/L		88	73 - 121	3	12
1,2-Dichlorobenzene	ND		10.0	8.328		ug/L		83	70 - 120	1	19
1,3-Dichlorobenzene	ND		10.0	8.039		ug/L		80	71 - 120	0	18
1,4-Dichlorobenzene	ND		10.0	8.042		ug/L		80	72 - 120	4	17
Dichlorodifluoromethane	ND		10.0	8.908		ug/L		89	45 - 130	17	34
1,1-Dichloroethane	ND		10.0	9.676		ug/L		97	69 - 122	2	11
1,2-Dichloroethane	ND		10.0	9.894		ug/L		99	64 - 138	3	11
1,1-Dichloroethene	ND		10.0	9.903		ug/L		99	62 - 127	2	14
1,2-Dichloropropane	ND		10.0	9.104		ug/L		91	72 - 131	5	12
Ethylbenzene	ND		10.0	9.161		ug/L		92	72 - 121	0	15
2-Hexanone	ND		20.0	16.06		ug/L		80	21 - 184	11	12
Isopropylbenzene	ND		10.0	8.804		ug/L		88	70 - 132	1	16
Methylene Chloride	ND		10.0	8.965		ug/L		90	52 - 137	1	12
4-Methyl-2-pentanone (MIBK)	ND		20.0	15.27		ug/L		76	53 - 147	6	16
Methyl tert-butyl ether	ND		10.0	8.619		ug/L		86	67 - 125	2	12
Styrene	ND		10.0	8.464		ug/L		85	74 - 125	3	14
1,1,2,2-Tetrachloroethane	ND		10.0	8.016		ug/L		80	51 - 123	4	17
Tetrachloroethene	ND		10.0	8.925		ug/L		89	69 - 126	0	18
Toluene	ND		10.0	8.813		ug/L		88	69 - 125	5	14
trans-1,2-Dichloroethene	ND		10.0	9.761		ug/L		98	66 - 131	1	11
trans-1,3-Dichloropropene	ND		10.0	7.061		ug/L		71	59 - 120	4	14
1,2,4-Trichlorobenzene	ND		10.0	7.275		ug/L		73	26 - 138	1	35
1,1,1-Trichloroethane	ND		10.0	10.44		ug/L		104	57 - 156	5	13
1,1,2-Trichloroethane	ND		10.0	8.859		ug/L		89	68 - 127	4	11
Trichloroethene	ND		10.0	8.991		ug/L		90	68 - 129	2	12
Trichlorofluoromethane	ND		10.0	12.90		ug/L		129	28 - 172	21	26
Vinyl chloride	ND	F2	10.0	9.871	F2	ug/L		99	55 - 123	14	12
Xylenes, Total	ND		20.0	17.60		ug/L		88	71 - 122	4	14

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*92*		*69 - 120*
Dibromofluoromethane (Surr)	*102*		*69 - 124*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-91339-F-9 MSD
Matrix: Water
Analysis Batch: 314918

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		61 - 138
Toluene-d8 (Surr)	99		73 - 120

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-314344/22-A
Matrix: Water
Analysis Batch: 314842

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 314344

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.200	0.0440	ug/L		02/12/18 06:48	02/15/18 15:16	1
Acenaphthylene	ND		0.200	0.0200	ug/L		02/12/18 06:48	02/15/18 15:16	1
Anthracene	ND		0.200	0.0310	ug/L		02/12/18 06:48	02/15/18 15:16	1
Benzo[a]anthracene	ND		0.200	0.0590	ug/L		02/12/18 06:48	02/15/18 15:16	1
Benzo[a]pyrene	ND		0.200	0.0300	ug/L		02/12/18 06:48	02/15/18 15:16	1
Benzo[b]fluoranthene	ND		0.200	0.0590	ug/L		02/12/18 06:48	02/15/18 15:16	1
Benzo[g,h,i]perylene	ND		0.200	0.0500	ug/L		02/12/18 06:48	02/15/18 15:16	1
Benzo[k]fluoranthene	ND		0.200	0.0480	ug/L		02/12/18 06:48	02/15/18 15:16	1
Chrysene	ND		0.200	0.0350	ug/L		02/12/18 06:48	02/15/18 15:16	1
Dibenz(a,h)anthracene	ND		0.200	0.0400	ug/L		02/12/18 06:48	02/15/18 15:16	1
Fluoranthene	ND		0.200	0.0270	ug/L		02/12/18 06:48	02/15/18 15:16	1
Fluorene	ND		0.200	0.0340	ug/L		02/12/18 06:48	02/15/18 15:16	1
Indeno[1,2,3-cd]pyrene	ND		0.200	0.0480	ug/L		02/12/18 06:48	02/15/18 15:16	1
Naphthalene	ND		0.200	0.0430	ug/L		02/12/18 06:48	02/15/18 15:16	1
Phenanthrene	ND		0.200	0.0310	ug/L		02/12/18 06:48	02/15/18 15:16	1
Pyrene	ND		0.200	0.0280	ug/L		02/12/18 06:48	02/15/18 15:16	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	58		32 - 120	02/12/18 06:48	02/15/18 15:16	1
2-Fluorophenol (Surr)	36		17 - 120	02/12/18 06:48	02/15/18 15:16	1
Nitrobenzene-d5 (Surr)	60		35 - 120	02/12/18 06:48	02/15/18 15:16	1
Phenol-d5 (Surr)	22		15 - 120	02/12/18 06:48	02/15/18 15:16	1
Terphenyl-d14 (Surr)	89		28 - 128	02/12/18 06:48	02/15/18 15:16	1
2,4,6-Tribromophenol (Surr)	58		33 - 120	02/12/18 06:48	02/15/18 15:16	1

Lab Sample ID: LCS 240-314344/23-A
Matrix: Water
Analysis Batch: 314842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 314344

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	32.0	23.47		ug/L		73	59 - 120
Acenaphthylene	32.0	24.32		ug/L		76	59 - 120
Anthracene	32.0	23.77		ug/L		74	59 - 120
Benzo[a]anthracene	32.0	24.47		ug/L		76	60 - 120
Benzo[a]pyrene	32.0	24.47		ug/L		76	61 - 120
Benzo[b]fluoranthene	32.0	25.10		ug/L		78	62 - 120
Benzo[g,h,i]perylene	32.0	22.52		ug/L		70	61 - 120

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-314344/23-A
Matrix: Water
Analysis Batch: 314842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 314344

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzo[k]fluoranthene	32.0	24.36		ug/L		76	60 - 120
Chrysene	32.0	23.34		ug/L		73	60 - 120
Dibenz(a,h)anthracene	32.0	20.35		ug/L		64	62 - 120
Fluoranthene	32.0	25.73		ug/L		80	62 - 120
Fluorene	32.0	23.66		ug/L		74	61 - 120
Indeno[1,2,3-cd]pyrene	32.0	20.60		ug/L		64	62 - 120
Naphthalene	32.0	23.21		ug/L		73	56 - 120
Phenanthrene	32.0	23.78		ug/L		74	59 - 120
Pyrene	32.0	24.77		ug/L		77	59 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*76*		*32 - 120*
2-Fluorophenol (Surr)	*51*		*17 - 120*
Nitrobenzene-d5 (Surr)	*82*		*35 - 120*
Phenol-d5 (Surr)	*29*		*15 - 120*
Terphenyl-d14 (Surr)	*79*		*28 - 128*
2,4,6-Tribromophenol (Surr)	*76*		*33 - 120*

Lab Sample ID: 240-91369-1 MS
Matrix: Water
Analysis Batch: 315026

Client Sample ID: MW6-020618-1655
Prep Type: Total/NA
Prep Batch: 314344

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	ND		33.3	24.54		ug/L		74	31 - 120
Acenaphthylene	ND		33.3	26.05		ug/L		78	27 - 120
Anthracene	ND		33.3	25.35		ug/L		76	33 - 120
Benzo[a]anthracene	ND		33.3	25.43		ug/L		76	31 - 120
Benzo[a]pyrene	ND		33.3	25.57		ug/L		77	22 - 124
Benzo[b]fluoranthene	ND		33.3	25.57		ug/L		77	25 - 124
Benzo[g,h,i]perylene	ND		33.3	21.96		ug/L		66	14 - 123
Benzo[k]fluoranthene	ND		33.3	25.91		ug/L		78	24 - 124
Chrysene	ND		33.3	23.99		ug/L		72	32 - 120
Dibenz(a,h)anthracene	ND		33.3	20.76		ug/L		62	16 - 124
Fluoranthene	ND		33.3	28.26		ug/L		85	34 - 120
Fluorene	ND		33.3	25.78		ug/L		77	34 - 120
Indeno[1,2,3-cd]pyrene	ND		33.3	20.79		ug/L		62	16 - 125
Naphthalene	ND		33.3	24.34		ug/L		73	19 - 120
Phenanthrene	0.338		33.3	25.48		ug/L		75	33 - 120
Pyrene	ND		33.3	24.92		ug/L		75	36 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*76*		*32 - 120*
2-Fluorophenol (Surr)	*75*		*17 - 120*
Nitrobenzene-d5 (Surr)	*82*		*35 - 120*
Phenol-d5 (Surr)	*58*		*15 - 120*
Terphenyl-d14 (Surr)	*70*		*28 - 128*
2,4,6-Tribromophenol (Surr)	*84*		*33 - 120*

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-91369-1 MSD
Matrix: Water
Analysis Batch: 315026

Client Sample ID: MW6-020618-1655
Prep Type: Total/NA
Prep Batch: 314344

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthene	ND		32.0	21.69		ug/L		68	31 - 120	12	35
Acenaphthylene	ND		32.0	23.25		ug/L		73	27 - 120	11	35
Anthracene	ND		32.0	22.88		ug/L		72	33 - 120	10	35
Benzo[a]anthracene	ND		32.0	23.33		ug/L		73	31 - 120	9	35
Benzo[a]pyrene	ND		32.0	23.57		ug/L		74	22 - 124	8	35
Benzo[b]fluoranthene	ND		32.0	23.71		ug/L		74	25 - 124	8	35
Benzo[g,h,i]perylene	ND		32.0	20.97		ug/L		66	14 - 123	5	35
Benzo[k]fluoranthene	ND		32.0	23.94		ug/L		75	24 - 124	8	35
Chrysene	ND		32.0	22.19		ug/L		69	32 - 120	8	35
Dibenz(a,h)anthracene	ND		32.0	19.87		ug/L		62	16 - 124	4	35
Fluoranthene	ND		32.0	26.11		ug/L		82	34 - 120	8	35
Fluorene	ND		32.0	23.01		ug/L		72	34 - 120	11	35
Indeno[1,2,3-cd]pyrene	ND		32.0	19.84		ug/L		62	16 - 125	5	35
Naphthalene	ND		32.0	21.79		ug/L		68	19 - 120	11	35
Phenanthrene	0.338		32.0	22.74		ug/L		70	33 - 120	11	35
Pyrene	ND		32.0	22.80		ug/L		71	36 - 120	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*71*		*32 - 120*
2-Fluorophenol (Surr)	*78*		*17 - 120*
Nitrobenzene-d5 (Surr)	*77*		*35 - 120*
Phenol-d5 (Surr)	*48*		*15 - 120*
Terphenyl-d14 (Surr)	*67*		*28 - 128*
2,4,6-Tribromophenol (Surr)	*81*		*33 - 120*

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 240-314417/1-A
Matrix: Water
Analysis Batch: 314628

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 314417

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		200	47.3	ug/L		02/12/18 14:00	02/13/18 14:23	1
Arsenic	ND		10.0	4.05	ug/L		02/12/18 14:00	02/13/18 14:23	1
Barium	ND		200	1.33	ug/L		02/12/18 14:00	02/13/18 14:23	1
Beryllium	ND		4.00	0.601	ug/L		02/12/18 14:00	02/13/18 14:23	1
Cadmium	ND		2.00	0.203	ug/L		02/12/18 14:00	02/13/18 14:23	1
Calcium	ND		5000	307	ug/L		02/12/18 14:00	02/13/18 14:23	1
Chromium	ND		5.00	0.625	ug/L		02/12/18 14:00	02/13/18 14:23	1
Cobalt	ND		10.0	0.752	ug/L		02/12/18 14:00	02/13/18 14:23	1
Copper	ND		25.0	3.55	ug/L		02/12/18 14:00	02/13/18 14:23	1
Iron	ND		100	26.0	ug/L		02/12/18 14:00	02/13/18 14:23	1
Lead	ND		5.00	2.77	ug/L		02/12/18 14:00	02/13/18 14:23	1
Magnesium	ND		5000	776	ug/L		02/12/18 14:00	02/13/18 14:23	1
Manganese	ND		15.0	2.12	ug/L		02/12/18 14:00	02/13/18 14:23	1
Nickel	ND		40.0	2.20	ug/L		02/12/18 14:00	02/13/18 14:23	1
Potassium	ND		5000	557	ug/L		02/12/18 14:00	02/13/18 14:23	1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MB 240-314417/1-A
Matrix: Water
Analysis Batch: 314628

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 314417

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		15.0	5.96	ug/L		02/12/18 14:00	02/13/18 14:23	1
Silver	ND		5.00	0.623	ug/L		02/12/18 14:00	02/13/18 14:23	1
Sodium	ND		5000	560	ug/L		02/12/18 14:00	02/13/18 14:23	1
Vanadium	ND		50.0	5.56	ug/L		02/12/18 14:00	02/13/18 14:23	1
Zinc	ND		50.0	9.67	ug/L		02/12/18 14:00	02/13/18 14:23	1

Lab Sample ID: LCS 240-314417/2-A
Matrix: Water
Analysis Batch: 314628

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 314417

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	2000	1909		ug/L		95	80 - 120
Arsenic	2000	2090		ug/L		105	80 - 120
Barium	2000	2003		ug/L		100	80 - 120
Beryllium	50.0	53.18		ug/L		106	80 - 120
Cadmium	50.0	51.43		ug/L		103	80 - 120
Calcium	50000	48340		ug/L		97	80 - 120
Chromium	200	195.1		ug/L		98	80 - 120
Cobalt	500	493.7		ug/L		99	80 - 120
Copper	250	262.1		ug/L		105	80 - 120
Iron	1000	975.1		ug/L		98	80 - 120
Lead	500	482.7		ug/L		97	80 - 120
Magnesium	50000	49850		ug/L		100	80 - 120
Manganese	500	540.1		ug/L		108	80 - 120
Nickel	500	504.6		ug/L		101	80 - 120
Potassium	50000	47810		ug/L		96	80 - 120
Selenium	2000	2115		ug/L		106	80 - 120
Silver	50.0	52.55		ug/L		105	80 - 120
Sodium	50000	51690		ug/L		103	80 - 120
Vanadium	500	478.3		ug/L		96	80 - 120
Zinc	500	504.5		ug/L		101	80 - 120

Lab Sample ID: 240-91369-1 MS
Matrix: Water
Analysis Batch: 314628

Client Sample ID: MW6-020618-1655
Prep Type: Total Recoverable
Prep Batch: 314417

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	2160	F1	2000	6068	F1	ug/L		195	75 - 125
Arsenic	5.89	J	2000	2262		ug/L		113	75 - 125
Barium	37.5	J	2000	2110		ug/L		104	75 - 125
Beryllium	ND		50.0	53.88		ug/L		108	75 - 125
Cadmium	ND		50.0	54.02		ug/L		108	75 - 125
Calcium	283000		50000	358000	4	ug/L		150	75 - 125
Chromium	4.53	J	200	201.5		ug/L		98	75 - 125
Cobalt	2.01	J	500	522.9		ug/L		104	75 - 125
Copper	ND		250	276.0		ug/L		110	75 - 125
Iron	19000		1000	22000	4	ug/L		296	75 - 125
Lead	ND		500	451.3		ug/L		90	75 - 125
Magnesium	169000	F1	50000	238300	F1	ug/L		138	75 - 125

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: 240-91369-1 MS — **Client Sample ID: MW6-020618-1655**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 314628 — **Prep Batch: 314417**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Manganese	715		500	1340		ug/L		125	75 - 125
Nickel	5.83	J	500	534.4		ug/L		106	75 - 125
Potassium	26400		50000	81840		ug/L		111	75 - 125
Selenium	ND		2000	2237		ug/L		112	75 - 125
Silver	ND		50.0	57.36		ug/L		115	75 - 125
Vanadium	ND		500	481.8		ug/L		96	75 - 125
Zinc	27.6	J	500	560.1		ug/L		106	75 - 125

Lab Sample ID: 240-91369-1 MS — **Client Sample ID: MW6-020618-1655**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 314856 — **Prep Batch: 314417**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sodium	844000		50000	966300	4	ug/L		245	75 - 125

Lab Sample ID: 240-91369-1 MSD — **Client Sample ID: MW6-020618-1655**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 314628 — **Prep Batch: 314417**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	2160	F1	2000	5880	F1	ug/L		186	75 - 125	3	20
Arsenic	5.89	J	2000	2209		ug/L		110	75 - 125	2	20
Barium	37.5	J	2000	2055		ug/L		101	75 - 125	3	20
Beryllium	ND		50.0	52.11		ug/L		104	75 - 125	3	20
Cadmium	ND		50.0	52.73		ug/L		105	75 - 125	2	20
Calcium	283000		50000	345200	4	ug/L		125	75 - 125	4	20
Chromium	4.53	J	200	195.0		ug/L		95	75 - 125	3	20
Cobalt	2.01	J	500	508.7		ug/L		101	75 - 125	3	20
Copper	ND		250	266.9		ug/L		107	75 - 125	3	20
Iron	19000		1000	21240	4	ug/L		220	75 - 125	4	20
Lead	ND		500	439.2		ug/L		88	75 - 125	3	20
Magnesium	169000	F1	50000	230000		ug/L		122	75 - 125	4	20
Manganese	715		500	1284		ug/L		114	75 - 125	4	20
Nickel	5.83	J	500	518.4		ug/L		103	75 - 125	3	20
Potassium	26400		50000	79230		ug/L		106	75 - 125	3	20
Selenium	ND		2000	2178		ug/L		109	75 - 125	3	20
Silver	ND		50.0	56.01		ug/L		112	75 - 125	2	20
Vanadium	ND		500	469.4		ug/L		94	75 - 125	3	20
Zinc	27.6	J	500	541.8		ug/L		103	75 - 125	3	20

Lab Sample ID: 240-91369-1 MSD — **Client Sample ID: MW6-020618-1655**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 314856 — **Prep Batch: 314417**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sodium	844000		50000	933800	4	ug/L		180	75 - 125	3	20

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 240-314417/1-A
Matrix: Water
Analysis Batch: 314708

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 314417

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00	0.570	ug/L		02/12/18 14:00	02/13/18 19:26	1
Thallium	ND		1.00	0.200	ug/L		02/12/18 14:00	02/13/18 19:26	1

Lab Sample ID: LCS 240-314417/3-A
Matrix: Water
Analysis Batch: 314708

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 314417

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	100	98.36		ug/L		98	80 - 120
Thallium	250	269.9		ug/L		108	80 - 120

Lab Sample ID: 240-91369-1 MS
Matrix: Water
Analysis Batch: 314708

Client Sample ID: MW6-020618-1655
Prep Type: Total Recoverable
Prep Batch: 314417

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	1.86	J	100	98.09		ug/L		96	75 - 125
Thallium	ND		250	235.6		ug/L		94	75 - 125

Lab Sample ID: 240-91369-1 MSD
Matrix: Water
Analysis Batch: 314708

Client Sample ID: MW6-020618-1655
Prep Type: Total Recoverable
Prep Batch: 314417

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	1.86	J	100	102.3		ug/L		100	75 - 125	4	20
Thallium	ND		250	245.0		ug/L		98	75 - 125	4	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-314419/1-A
Matrix: Water
Analysis Batch: 314788

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 314419

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.130	ug/L		02/12/18 14:00	02/13/18 13:44	1

Lab Sample ID: LCS 240-314419/2-A
Matrix: Water
Analysis Batch: 314788

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 314419

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.936		ug/L		99	80 - 120

Lab Sample ID: 240-91369-1 MS
Matrix: Water
Analysis Batch: 314788

Client Sample ID: MW6-020618-1655
Prep Type: Total/NA
Prep Batch: 314419

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		1.00	0.9829		ug/L		98	80 - 120

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 240-91369-1 MSD — **Client Sample ID: MW6-020618-1655**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314788 — **Prep Batch: 314419**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		1.00	0.9480		ug/L		95	80 - 120	4	20

Method: 9012A - Cyanide, Total and/or Amenable

Lab Sample ID: MB 240-314454/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314486 — **Prep Batch: 314454**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		0.0100	0.00600	mg/L		02/12/18 12:30	02/12/18 14:44	1

Lab Sample ID: LCS 240-314454/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314486 — **Prep Batch: 314454**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.598	0.5227		mg/L		87	59 - 129

Lab Sample ID: 240-91369-1 MS — **Client Sample ID: MW6-020618-1655**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314486 — **Prep Batch: 314454**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	ND		0.0400	0.04220		mg/L		106	22 - 135

Lab Sample ID: 240-91369-1 MSD — **Client Sample ID: MW6-020618-1655**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314486 — **Prep Batch: 314454**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cyanide, Total	ND		0.0400	0.04150		mg/L		104	22 - 135	2	40

Lab Sample ID: MB 240-314623/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314653 — **Prep Batch: 314623**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		0.0100	0.00600	mg/L		02/13/18 13:11	02/13/18 14:55	1

Lab Sample ID: LCS 240-314623/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314653 — **Prep Batch: 314623**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.598	0.5588		mg/L		93	59 - 129

QC Sample Results

Client: Duke Energy Corporation
Project/Site: East End Gas Works-EAST J18020380

TestAmerica Job ID: 240-91369-1

Method: 9012A - Cyanide, Total and/or Amenable (Continued)

Lab Sample ID: 240-91366-A-4-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314653 — **Prep Batch: 314623**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	ND		0.0400	0.02640		mg/L		66	22 - 135

Lab Sample ID: 240-91366-A-4-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314653 — **Prep Batch: 314623**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cyanide, Total	ND		0.0400	0.02740		mg/L		69	22 - 135	4	40

GC/MS VOA

Analysis Batch: 314603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total/NA	Water	8260B	
240-91369-2	4479-020618-0001	Total/NA	Water	8260B	
240-91369-3	MW8D-020718-1025	Total/NA	Water	8260B	
240-91369-4	MW8S-020718-1230	Total/NA	Water	8260B	
240-91369-5	MW7D-020718-1023	Total/NA	Water	8260B	
240-91369-6	MW7S-020718-1203	Total/NA	Water	8260B	
240-91369-7	MWK09S-020718-1445	Total/NA	Water	8260B	
240-91369-8	MWK09D-020718-1553	Total/NA	Water	8260B	
240-91369-9	4413-020718-0001	Total/NA	Water	8260B	
240-91369-10	MW19S-020818-0929	Total/NA	Water	8260B	
240-91369-11	MW21D-020818-1119	Total/NA	Water	8260B	
240-91369-12	MW25D-020818-1335	Total/NA	Water	8260B	
MB 240-314603/7	Method Blank	Total/NA	Water	8260B	
LCS 240-314603/5	Lab Control Sample	Total/NA	Water	8260B	
240-91369-1 MS	MW6-020618-1655	Total/NA	Water	8260B	
240-91369-1 MSD	MW6-020618-1655	Total/NA	Water	8260B	

Analysis Batch: 314918

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-13	MW21S-020818-1430	Total/NA	Water	8260B	
240-91369-14	TW1S-020818-0959	Total/NA	Water	8260B	
240-91369-15	TW2I-020818-1135	Total/NA	Water	8260B	
240-91369-16	MW3DR-020818-1423	Total/NA	Water	8260B	
240-91369-17	MW26S-020818-1620	Total/NA	Water	8260B	
240-91369-18	4479-020818-0001	Total/NA	Water	8260B	
240-91369-19	4413-020818-0001	Total/NA	Water	8260B	
240-91369-20	MW4DR-020718-1420	Total/NA	Water	8260B	
MB 240-314918/6	Method Blank	Total/NA	Water	8260B	
LCS 240-314918/4	Lab Control Sample	Total/NA	Water	8260B	
240-91339-E-9 MS	Matrix Spike	Total/NA	Water	8260B	
240-91339-F-9 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 314344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total/NA	Water	3510C	
240-91369-3	MW8D-020718-1025	Total/NA	Water	3510C	
240-91369-4	MW8S-020718-1230	Total/NA	Water	3510C	
240-91369-5	MW7D-020718-1023	Total/NA	Water	3510C	
240-91369-6	MW7S-020718-1203	Total/NA	Water	3510C	
240-91369-7	MWK09S-020718-1445	Total/NA	Water	3510C	
240-91369-8	MWK09D-020718-1553	Total/NA	Water	3510C	
240-91369-9	4413-020718-0001	Total/NA	Water	3510C	
240-91369-10	MW19S-020818-0929	Total/NA	Water	3510C	
240-91369-11	MW21D-020818-1119	Total/NA	Water	3510C	
240-91369-12	MW25D-020818-1335	Total/NA	Water	3510C	
240-91369-13	MW21S-020818-1430	Total/NA	Water	3510C	
240-91369-14	TW1S-020818-0959	Total/NA	Water	3510C	
240-91369-15	TW2I-020818-1135	Total/NA	Water	3510C	

GC/MS Semi VOA (Continued)

Prep Batch: 314344 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-16 - RA	MW3DR-020818-1423	Total/NA	Water	3510C	
240-91369-16	MW3DR-020818-1423	Total/NA	Water	3510C	
240-91369-17	MW26S-020818-1620	Total/NA	Water	3510C	
240-91369-18	4479-020818-0001	Total/NA	Water	3510C	
240-91369-19	4413-020818-0001	Total/NA	Water	3510C	
240-91369-20 - RA	MW4DR-020718-1420	Total/NA	Water	3510C	
240-91369-20	MW4DR-020718-1420	Total/NA	Water	3510C	
MB 240-314344/22-A	Method Blank	Total/NA	Water	3510C	
LCS 240-314344/23-A	Lab Control Sample	Total/NA	Water	3510C	
240-91369-1 MS	MW6-020618-1655	Total/NA	Water	3510C	
240-91369-1 MSD	MW6-020618-1655	Total/NA	Water	3510C	

Analysis Batch: 314842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-3	MW8D-020718-1025	Total/NA	Water	8270C	314344
240-91369-4	MW8S-020718-1230	Total/NA	Water	8270C	314344
240-91369-6	MW7S-020718-1203	Total/NA	Water	8270C	314344
240-91369-7	MWK09S-020718-1445	Total/NA	Water	8270C	314344
240-91369-8	MWK09D-020718-1553	Total/NA	Water	8270C	314344
240-91369-9	4413-020718-0001	Total/NA	Water	8270C	314344
240-91369-10	MW19S-020818-0929	Total/NA	Water	8270C	314344
240-91369-11	MW21D-020818-1119	Total/NA	Water	8270C	314344
MB 240-314344/22-A	Method Blank	Total/NA	Water	8270C	314344
LCS 240-314344/23-A	Lab Control Sample	Total/NA	Water	8270C	314344

Analysis Batch: 315026

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total/NA	Water	8270C	314344
240-91369-5	MW7D-020718-1023	Total/NA	Water	8270C	314344
240-91369-12	MW25D-020818-1335	Total/NA	Water	8270C	314344
240-91369-13	MW21S-020818-1430	Total/NA	Water	8270C	314344
240-91369-14	TW1S-020818-0959	Total/NA	Water	8270C	314344
240-91369-15	TW2I-020818-1135	Total/NA	Water	8270C	314344
240-91369-16	MW3DR-020818-1423	Total/NA	Water	8270C	314344
240-91369-17	MW26S-020818-1620	Total/NA	Water	8270C	314344
240-91369-18	4479-020818-0001	Total/NA	Water	8270C	314344
240-91369-19	4413-020818-0001	Total/NA	Water	8270C	314344
240-91369-20	MW4DR-020718-1420	Total/NA	Water	8270C	314344
240-91369-1 MS	MW6-020618-1655	Total/NA	Water	8270C	314344
240-91369-1 MSD	MW6-020618-1655	Total/NA	Water	8270C	314344

Analysis Batch: 315890

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-16 - RA	MW3DR-020818-1423	Total/NA	Water	8270C	314344
240-91369-20 - RA	MW4DR-020718-1420	Total/NA	Water	8270C	314344

Metals

Prep Batch: 314417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total Recoverable	Water	3005A	
240-91369-3	MW8D-020718-1025	Total Recoverable	Water	3005A	
240-91369-4	MW8S-020718-1230	Total Recoverable	Water	3005A	
240-91369-5	MW7D-020718-1023	Total Recoverable	Water	3005A	
240-91369-6	MW7S-020718-1203	Total Recoverable	Water	3005A	
240-91369-7	MWK09S-020718-1445	Total Recoverable	Water	3005A	
240-91369-8	MWK09D-020718-1553	Total Recoverable	Water	3005A	
240-91369-9	4413-020718-0001	Total Recoverable	Water	3005A	
240-91369-10	MW19S-020818-0929	Total Recoverable	Water	3005A	
240-91369-11	MW21D-020818-1119	Total Recoverable	Water	3005A	
240-91369-12	MW25D-020818-1335	Total Recoverable	Water	3005A	
240-91369-13	MW21S-020818-1430	Total Recoverable	Water	3005A	
240-91369-14	TW1S-020818-0959	Total Recoverable	Water	3005A	
240-91369-15	TW2I-020818-1135	Total Recoverable	Water	3005A	
240-91369-16	MW3DR-020818-1423	Total Recoverable	Water	3005A	
240-91369-17	MW26S-020818-1620	Total Recoverable	Water	3005A	
240-91369-18	4479-020818-0001	Total Recoverable	Water	3005A	
240-91369-19	4413-020818-0001	Total Recoverable	Water	3005A	
240-91369-20	MW4DR-020718-1420	Total Recoverable	Water	3005A	
MB 240-314417/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-314417/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-314417/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-91369-1 MS	MW6-020618-1655	Total Recoverable	Water	3005A	
240-91369-1 MS	MW6-020618-1655	Total Recoverable	Water	3005A	
240-91369-1 MSD	MW6-020618-1655	Total Recoverable	Water	3005A	
240-91369-1 MSD	MW6-020618-1655	Total Recoverable	Water	3005A	

Prep Batch: 314419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total/NA	Water	7470A	
240-91369-3	MW8D-020718-1025	Total/NA	Water	7470A	
240-91369-4	MW8S-020718-1230	Total/NA	Water	7470A	
240-91369-5	MW7D-020718-1023	Total/NA	Water	7470A	
240-91369-6	MW7S-020718-1203	Total/NA	Water	7470A	
240-91369-7	MWK09S-020718-1445	Total/NA	Water	7470A	
240-91369-8	MWK09D-020718-1553	Total/NA	Water	7470A	
240-91369-9	4413-020718-0001	Total/NA	Water	7470A	
240-91369-10	MW19S-020818-0929	Total/NA	Water	7470A	
240-91369-11	MW21D-020818-1119	Total/NA	Water	7470A	
240-91369-12	MW25D-020818-1335	Total/NA	Water	7470A	
240-91369-13	MW21S-020818-1430	Total/NA	Water	7470A	
240-91369-14	TW1S-020818-0959	Total/NA	Water	7470A	
240-91369-15	TW2I-020818-1135	Total/NA	Water	7470A	
240-91369-16	MW3DR-020818-1423	Total/NA	Water	7470A	
240-91369-17	MW26S-020818-1620	Total/NA	Water	7470A	
240-91369-18	4479-020818-0001	Total/NA	Water	7470A	
240-91369-19	4413-020818-0001	Total/NA	Water	7470A	
240-91369-20	MW4DR-020718-1420	Total/NA	Water	7470A	
MB 240-314419/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-314419/2-A	Lab Control Sample	Total/NA	Water	7470A	
240-91369-1 MS	MW6-020618-1655	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 314419 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1 MSD	MW6-020618-1655	Total/NA	Water	7470A	

Analysis Batch: 314628

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total Recoverable	Water	6010B	314417
240-91369-3	MW8D-020718-1025	Total Recoverable	Water	6010B	314417
240-91369-4	MW8S-020718-1230	Total Recoverable	Water	6010B	314417
240-91369-5	MW7D-020718-1023	Total Recoverable	Water	6010B	314417
240-91369-6	MW7S-020718-1203	Total Recoverable	Water	6010B	314417
240-91369-7	MWK09S-020718-1445	Total Recoverable	Water	6010B	314417
240-91369-8	MWK09D-020718-1553	Total Recoverable	Water	6010B	314417
240-91369-9	4413-020718-0001	Total Recoverable	Water	6010B	314417
240-91369-10	MW19S-020818-0929	Total Recoverable	Water	6010B	314417
240-91369-11	MW21D-020818-1119	Total Recoverable	Water	6010B	314417
240-91369-12	MW25D-020818-1335	Total Recoverable	Water	6010B	314417
240-91369-13	MW21S-020818-1430	Total Recoverable	Water	6010B	314417
240-91369-14	TW1S-020818-0959	Total Recoverable	Water	6010B	314417
240-91369-15	TW2I-020818-1135	Total Recoverable	Water	6010B	314417
240-91369-16	MW3DR-020818-1423	Total Recoverable	Water	6010B	314417
240-91369-17	MW26S-020818-1620	Total Recoverable	Water	6010B	314417
240-91369-18	4479-020818-0001	Total Recoverable	Water	6010B	314417
240-91369-19	4413-020818-0001	Total Recoverable	Water	6010B	314417
240-91369-20	MW4DR-020718-1420	Total Recoverable	Water	6010B	314417
MB 240-314417/1-A	Method Blank	Total Recoverable	Water	6010B	314417
LCS 240-314417/2-A	Lab Control Sample	Total Recoverable	Water	6010B	314417
240-91369-1 MS	MW6-020618-1655	Total Recoverable	Water	6010B	314417
240-91369-1 MSD	MW6-020618-1655	Total Recoverable	Water	6010B	314417

Analysis Batch: 314708

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total Recoverable	Water	6020	314417
240-91369-3	MW8D-020718-1025	Total Recoverable	Water	6020	314417
240-91369-4	MW8S-020718-1230	Total Recoverable	Water	6020	314417
240-91369-5	MW7D-020718-1023	Total Recoverable	Water	6020	314417
240-91369-6	MW7S-020718-1203	Total Recoverable	Water	6020	314417
240-91369-7	MWK09S-020718-1445	Total Recoverable	Water	6020	314417
240-91369-8	MWK09D-020718-1553	Total Recoverable	Water	6020	314417
240-91369-9	4413-020718-0001	Total Recoverable	Water	6020	314417
240-91369-10	MW19S-020818-0929	Total Recoverable	Water	6020	314417
240-91369-11	MW21D-020818-1119	Total Recoverable	Water	6020	314417
240-91369-12	MW25D-020818-1335	Total Recoverable	Water	6020	314417
240-91369-13	MW21S-020818-1430	Total Recoverable	Water	6020	314417
240-91369-14	TW1S-020818-0959	Total Recoverable	Water	6020	314417
240-91369-15	TW2I-020818-1135	Total Recoverable	Water	6020	314417
240-91369-16	MW3DR-020818-1423	Total Recoverable	Water	6020	314417
240-91369-17	MW26S-020818-1620	Total Recoverable	Water	6020	314417
240-91369-18	4479-020818-0001	Total Recoverable	Water	6020	314417
240-91369-19	4413-020818-0001	Total Recoverable	Water	6020	314417
240-91369-20	MW4DR-020718-1420	Total Recoverable	Water	6020	314417
MB 240-314417/1-A	Method Blank	Total Recoverable	Water	6020	314417
LCS 240-314417/3-A	Lab Control Sample	Total Recoverable	Water	6020	314417

Metals (Continued)

Analysis Batch: 314708 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1 MS	MW6-020618-1655	Total Recoverable	Water	6020	314417
240-91369-1 MSD	MW6-020618-1655	Total Recoverable	Water	6020	314417

Analysis Batch: 314788

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total/NA	Water	7470A	314419
240-91369-3	MW8D-020718-1025	Total/NA	Water	7470A	314419
240-91369-4	MW8S-020718-1230	Total/NA	Water	7470A	314419
240-91369-5	MW7D-020718-1023	Total/NA	Water	7470A	314419
240-91369-6	MW7S-020718-1203	Total/NA	Water	7470A	314419
240-91369-7	MWK09S-020718-1445	Total/NA	Water	7470A	314419
240-91369-8	MWK09D-020718-1553	Total/NA	Water	7470A	314419
240-91369-9	4413-020718-0001	Total/NA	Water	7470A	314419
240-91369-10	MW19S-020818-0929	Total/NA	Water	7470A	314419
240-91369-11	MW21D-020818-1119	Total/NA	Water	7470A	314419
240-91369-12	MW25D-020818-1335	Total/NA	Water	7470A	314419
240-91369-13	MW21S-020818-1430	Total/NA	Water	7470A	314419
240-91369-14	TW1S-020818-0959	Total/NA	Water	7470A	314419
240-91369-15	TW2I-020818-1135	Total/NA	Water	7470A	314419
240-91369-16	MW3DR-020818-1423	Total/NA	Water	7470A	314419
240-91369-17	MW26S-020818-1620	Total/NA	Water	7470A	314419
240-91369-18	4479-020818-0001	Total/NA	Water	7470A	314419
240-91369-19	4413-020818-0001	Total/NA	Water	7470A	314419
240-91369-20	MW4DR-020718-1420	Total/NA	Water	7470A	314419
MB 240-314419/1-A	Method Blank	Total/NA	Water	7470A	314419
LCS 240-314419/2-A	Lab Control Sample	Total/NA	Water	7470A	314419
240-91369-1 MS	MW6-020618-1655	Total/NA	Water	7470A	314419
240-91369-1 MSD	MW6-020618-1655	Total/NA	Water	7470A	314419

Analysis Batch: 314856

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total Recoverable	Water	6010B	314417
240-91369-14	TW1S-020818-0959	Total Recoverable	Water	6010B	314417
240-91369-1 MS	MW6-020618-1655	Total Recoverable	Water	6010B	314417
240-91369-1 MSD	MW6-020618-1655	Total Recoverable	Water	6010B	314417

General Chemistry

Prep Batch: 314454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total/NA	Water	9012A	
240-91369-3	MW8D-020718-1025	Total/NA	Water	9012A	
240-91369-4	MW8S-020718-1230	Total/NA	Water	9012A	
240-91369-5	MW7D-020718-1023	Total/NA	Water	9012A	
240-91369-6	MW7S-020718-1203	Total/NA	Water	9012A	
240-91369-7	MWK09S-020718-1445	Total/NA	Water	9012A	
240-91369-8	MWK09D-020718-1553	Total/NA	Water	9012A	
240-91369-9	4413-020718-0001	Total/NA	Water	9012A	
240-91369-10	MW19S-020818-0929	Total/NA	Water	9012A	
240-91369-20	MW4DR-020718-1420	Total/NA	Water	9012A	

General Chemistry (Continued)

Prep Batch: 314454 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-314454/1-A	Method Blank	Total/NA	Water	9012A	
LCS 240-314454/2-A	Lab Control Sample	Total/NA	Water	9012A	
240-91369-1 MS	MW6-020618-1655	Total/NA	Water	9012A	
240-91369-1 MSD	MW6-020618-1655	Total/NA	Water	9012A	

Analysis Batch: 314486

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-1	MW6-020618-1655	Total/NA	Water	9012A	314454
240-91369-3	MW8D-020718-1025	Total/NA	Water	9012A	314454
240-91369-4	MW8S-020718-1230	Total/NA	Water	9012A	314454
240-91369-5	MW7D-020718-1023	Total/NA	Water	9012A	314454
240-91369-6	MW7S-020718-1203	Total/NA	Water	9012A	314454
240-91369-7	MWK09S-020718-1445	Total/NA	Water	9012A	314454
240-91369-8	MWK09D-020718-1553	Total/NA	Water	9012A	314454
240-91369-9	4413-020718-0001	Total/NA	Water	9012A	314454
240-91369-10	MW19S-020818-0929	Total/NA	Water	9012A	314454
240-91369-20	MW4DR-020718-1420	Total/NA	Water	9012A	314454
MB 240-314454/1-A	Method Blank	Total/NA	Water	9012A	314454
LCS 240-314454/2-A	Lab Control Sample	Total/NA	Water	9012A	314454
240-91369-1 MS	MW6-020618-1655	Total/NA	Water	9012A	314454
240-91369-1 MSD	MW6-020618-1655	Total/NA	Water	9012A	314454

Prep Batch: 314623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-11	MW21D-020818-1119	Total/NA	Water	9012A	
240-91369-12	MW25D-020818-1335	Total/NA	Water	9012A	
240-91369-13	MW21S-020818-1430	Total/NA	Water	9012A	
240-91369-14	TW1S-020818-0959	Total/NA	Water	9012A	
240-91369-15	TW2I-020818-1135	Total/NA	Water	9012A	
240-91369-16	MW3DR-020818-1423	Total/NA	Water	9012A	
240-91369-17	MW26S-020818-1620	Total/NA	Water	9012A	
240-91369-18	4479-020818-0001	Total/NA	Water	9012A	
240-91369-19	4413-020818-0001	Total/NA	Water	9012A	
MB 240-314623/1-A	Method Blank	Total/NA	Water	9012A	
LCS 240-314623/2-A	Lab Control Sample	Total/NA	Water	9012A	
240-91366-A-4-B MS	Matrix Spike	Total/NA	Water	9012A	
240-91366-A-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	9012A	

Analysis Batch: 314653

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91369-11	MW21D-020818-1119	Total/NA	Water	9012A	314623
240-91369-12	MW25D-020818-1335	Total/NA	Water	9012A	314623
240-91369-13	MW21S-020818-1430	Total/NA	Water	9012A	314623
240-91369-14	TW1S-020818-0959	Total/NA	Water	9012A	314623
240-91369-15	TW2I-020818-1135	Total/NA	Water	9012A	314623
240-91369-16	MW3DR-020818-1423	Total/NA	Water	9012A	314623
240-91369-17	MW26S-020818-1620	Total/NA	Water	9012A	314623
240-91369-18	4479-020818-0001	Total/NA	Water	9012A	314623
240-91369-19	4413-020818-0001	Total/NA	Water	9012A	314623
MB 240-314623/1-A	Method Blank	Total/NA	Water	9012A	314623
LCS 240-314623/2-A	Lab Control Sample	Total/NA	Water	9012A	314623

QC Association Summary

Client: Duke Energy Corporation
Project/Site: East End Gas Works-EAST J18020380

TestAmerica Job ID: 240-91369-1

General Chemistry (Continued)

Analysis Batch: 314653 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91366-A-4-B MS	Matrix Spike	Total/NA	Water	9012A	314623
240-91366-A-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	9012A	314623

Client Sample ID: MW6-020618-1655

Lab Sample ID: 240-91369-1

Date Collected: 02/06/18 16:55

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 23:34	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	315026	02/16/18 08:17	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 14:31	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		5	314856	02/14/18 16:49	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 15:22	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 13:48	AJC	TAL CAN
Total/NA	Prep	9012A			314454	02/12/18 12:30	JESW	TAL CAN
Total/NA	Analysis	9012A		1	314486	02/12/18 14:47	JESW	TAL CAN

Client Sample ID: 4479-020618-0001

Lab Sample ID: 240-91369-2

Date Collected: 02/06/18 16:00

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 19:20	LRW	TAL CAN

Client Sample ID: MW8D-020718-1025

Lab Sample ID: 240-91369-3

Date Collected: 02/07/18 10:25

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 19:43	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	314842	02/15/18 18:36	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 15:22	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 15:57	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 13:57	AJC	TAL CAN
Total/NA	Prep	9012A			314454	02/12/18 12:30	JESW	TAL CAN
Total/NA	Analysis	9012A		1	314486	02/12/18 14:53	JESW	TAL CAN

Client Sample ID: MW8S-020718-1230

Lab Sample ID: 240-91369-4

Date Collected: 02/07/18 12:30

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 20:06	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	314842	02/15/18 19:01	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 15:27	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:02	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 13:58	AJC	TAL CAN
Total/NA	Prep	9012A			314454	02/12/18 12:30	JESW	TAL CAN
Total/NA	Analysis	9012A		5	314486	02/12/18 15:38	JESW	TAL CAN

Client Sample ID: MW7D-020718-1023

Lab Sample ID: 240-91369-5

Date Collected: 02/07/18 10:23

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 20:29	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	315026	02/16/18 09:32	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 15:40	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:06	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:00	AJC	TAL CAN
Total/NA	Prep	9012A			314454	02/12/18 12:30	JESW	TAL CAN
Total/NA	Analysis	9012A		1	314486	02/12/18 14:56	JESW	TAL CAN

Client Sample ID: MW7S-020718-1203

Lab Sample ID: 240-91369-6

Date Collected: 02/07/18 12:03

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 20:52	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	314842	02/15/18 16:06	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 15:44	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:11	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:06	AJC	TAL CAN

Client Sample ID: MW7S-020718-1203

Lab Sample ID: 240-91369-6

Date Collected: 02/07/18 12:03

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	9012A			314454	02/12/18 12:30	JESW	TAL CAN
Total/NA	Analysis	9012A		1	314486	02/12/18 14:58	JESW	TAL CAN

Client Sample ID: MWK09S-020718-1445

Lab Sample ID: 240-91369-7

Date Collected: 02/07/18 14:45

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 21:15	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	314842	02/15/18 16:31	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 15:48	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:15	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:08	AJC	TAL CAN
Total/NA	Prep	9012A			314454	02/12/18 12:30	JESW	TAL CAN
Total/NA	Analysis	9012A		1	314486	02/12/18 15:00	JESW	TAL CAN

Client Sample ID: MWK09D-020718-1553

Lab Sample ID: 240-91369-8

Date Collected: 02/07/18 15:53

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 21:38	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	314842	02/15/18 16:56	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 15:52	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:19	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:10	AJC	TAL CAN
Total/NA	Prep	9012A			314454	02/12/18 12:30	JESW	TAL CAN
Total/NA	Analysis	9012A		1	314486	02/12/18 15:05	JESW	TAL CAN

Client Sample ID: 4413-020718-0001

Lab Sample ID: 240-91369-9

Date Collected: 02/07/18 00:00

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 22:02	LRW	TAL CAN

Client Sample ID: 4413-020718-0001

Lab Sample ID: 240-91369-9

Date Collected: 02/07/18 00:00

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	314842	02/15/18 17:21	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 15:57	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:24	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:12	AJC	TAL CAN
Total/NA	Prep	9012A			314454	02/12/18 12:30	JESW	TAL CAN
Total/NA	Analysis	9012A		1	314486	02/12/18 15:07	JESW	TAL CAN

Client Sample ID: MW19S-020818-0929

Lab Sample ID: 240-91369-10

Date Collected: 02/08/18 09:29

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 22:25	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	314842	02/15/18 17:46	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:01	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:28	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:14	AJC	TAL CAN
Total/NA	Prep	9012A			314454	02/12/18 12:30	JESW	TAL CAN
Total/NA	Analysis	9012A		1	314486	02/12/18 15:09	JESW	TAL CAN

Client Sample ID: MW21D-020818-1119

Lab Sample ID: 240-91369-11

Date Collected: 02/08/18 11:19

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314603	02/13/18 22:48	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	314842	02/15/18 18:11	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:05	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:33	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:16	AJC	TAL CAN
Total/NA	Prep	9012A			314623	02/13/18 13:11	JWW	TAL CAN

Client Sample ID: MW21D-020818-1119

Lab Sample ID: 240-91369-11

Date Collected: 02/08/18 11:19

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9012A		1	314653	02/13/18 15:09	JWW	TAL CAN

Client Sample ID: MW25D-020818-1335

Lab Sample ID: 240-91369-12

Date Collected: 02/08/18 13:35

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		25	314603	02/13/18 23:11	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		6.66666	315026	02/16/18 13:15	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:10	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:46	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:18	AJC	TAL CAN
Total/NA	Prep	9012A			314623	02/13/18 13:11	JWW	TAL CAN
Total/NA	Analysis	9012A		1	314653	02/13/18 15:11	JWW	TAL CAN

Client Sample ID: MW21S-020818-1430

Lab Sample ID: 240-91369-13

Date Collected: 02/08/18 14:30

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314918	02/15/18 16:17	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	315026	02/16/18 10:21	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:14	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:51	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:20	AJC	TAL CAN
Total/NA	Prep	9012A			314623	02/13/18 13:11	JWW	TAL CAN
Total/NA	Analysis	9012A		1	314653	02/13/18 15:13	JWW	TAL CAN

Client Sample ID: TW1S-020818-0959

Lab Sample ID: 240-91369-14

Date Collected: 02/08/18 09:59

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		100	314918	02/15/18 16:40	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN

Client Sample ID: TW1S-020818-0959

Lab Sample ID: 240-91369-14

Date Collected: 02/08/18 09:59

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270C		20	315026	02/16/18 07:52	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:19	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		2	314856	02/14/18 17:05	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:55	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:22	AJC	TAL CAN
Total/NA	Prep	9012A			314623	02/13/18 13:11	JWW	TAL CAN
Total/NA	Analysis	9012A		1	314653	02/13/18 15:18	JWW	TAL CAN

Client Sample ID: TW2I-020818-1135

Lab Sample ID: 240-91369-15

Date Collected: 02/08/18 11:35

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314918	02/15/18 17:02	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	315026	02/16/18 10:46	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:32	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 16:59	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:24	AJC	TAL CAN
Total/NA	Prep	9012A			314623	02/13/18 13:11	JWW	TAL CAN
Total/NA	Analysis	9012A		1	314653	02/13/18 15:20	JWW	TAL CAN

Client Sample ID: MW3DR-020818-1423

Lab Sample ID: 240-91369-16

Date Collected: 02/08/18 14:23

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		500	314918	02/15/18 17:24	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	315026	02/16/18 11:11	TMH	TAL CAN
Total/NA	Prep	3510C	RA		314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C	RA	50	315890	02/23/18 11:01	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:36	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 17:04	RKT	TAL CAN

Client Sample ID: MW3DR-020818-1423

Lab Sample ID: 240-91369-16

Date Collected: 02/08/18 14:23

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:30	AJC	TAL CAN
Total/NA	Prep	9012A			314623	02/13/18 13:11	JWW	TAL CAN
Total/NA	Analysis	9012A		1	314653	02/13/18 15:21	JWW	TAL CAN

Client Sample ID: MW26S-020818-1620

Lab Sample ID: 240-91369-17

Date Collected: 02/08/18 16:20

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314918	02/15/18 17:46	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	315026	02/16/18 11:36	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:40	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 17:08	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:32	AJC	TAL CAN
Total/NA	Prep	9012A			314623	02/13/18 13:11	JWW	TAL CAN
Total/NA	Analysis	9012A		1	314653	02/13/18 15:23	JWW	TAL CAN

Client Sample ID: 4479-020818-0001

Lab Sample ID: 240-91369-18

Date Collected: 02/08/18 12:30

Matrix: Water

Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314918	02/15/18 18:08	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	315026	02/16/18 12:01	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:45	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 17:13	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:34	AJC	TAL CAN
Total/NA	Prep	9012A			314623	02/13/18 13:11	JWW	TAL CAN
Total/NA	Analysis	9012A		1	314653	02/13/18 15:25	JWW	TAL CAN

Lab Chronicle

Client: Duke Energy Corporation
Project/Site: East End Gas Works-EAST J18020380

TestAmerica Job ID: 240-91369-1

Client Sample ID: 4413-020818-0001

Lab Sample ID: 240-91369-19

Date Collected: 02/08/18 12:30
Matrix: Water
Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	314918	02/15/18 18:30	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	315026	02/16/18 12:25	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:49	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 17:17	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:36	AJC	TAL CAN
Total/NA	Prep	9012A			314623	02/13/18 13:11	JWW	TAL CAN
Total/NA	Analysis	9012A		1	314653	02/13/18 15:27	JWW	TAL CAN

Client Sample ID: MW4DR-020718-1420

Lab Sample ID: 240-91369-20

Date Collected: 02/07/18 14:20
Matrix: Water
Date Received: 02/10/18 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		100	314918	02/15/18 18:52	LRW	TAL CAN
Total/NA	Prep	3510C			314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C		1	315026	02/16/18 12:50	TMH	TAL CAN
Total/NA	Prep	3510C	RA		314344	02/12/18 06:48	SDE	TAL CAN
Total/NA	Analysis	8270C	RA	4	315890	02/23/18 10:37	TMH	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010B		1	314628	02/13/18 16:53	AS1	TAL CAN
Total Recoverable	Prep	3005A			314417	02/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020		1	314708	02/13/18 17:22	RKT	TAL CAN
Total/NA	Prep	7470A			314419	02/12/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1	314788	02/13/18 14:38	AJC	TAL CAN
Total/NA	Prep	9012A			314454	02/12/18 12:30	JESW	TAL CAN
Total/NA	Analysis	9012A		1	314486	02/12/18 15:11	JESW	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: Duke Energy Corporation
Project/Site: East End Gas Works-EAST J18020380

TestAmerica Job ID: 240-91369-1

Laboratory: TestAmerica Canton

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Ohio VAP	State Program	5	CL0024	09-06-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010B	3005A	Water	Magnesium

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Ohio VAP	State Program	5	CL0033	07-06-19

TestAmerica CANTON
send samples to TestAmerica CANTON
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

[redacted]

TestAmeric
THE LEADER IN ENVIRONMENTAL TES

Client Information	Sampler: T. Dennisen + J. Gerger	Lab PM: Brown, Shali 615-301-5031	Carrier Tracking No(s):	COC No:
Client Contact: Kristen Wright-NG	Phone: 937-308-7234, 440-429-2965	E-Mail: shali.brown@testamericainc.com		Page: 1
Company: Haley & Aldrich, Inc. for (DUKE ENERGY)				Job #:
Address: 8899 Gander Creek Drive	Due Date Requested:			
City: Miamisburg	TAT Requested (days): STD			
State, Zip: Ohio				
Phone: 703-336-6215	PO #: 131783-003			
Email: KWrightNG@haleyaldrich.com	WO #:			
Project Name: East End Gas Works	Project #: 49006334			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260 Volatiles Custom List (TA Canton)	8270 PAH_LL List (TA Canton)	6010 TAL Metals (no Sb or Tl) (TA Canton)	6020 Sb and Tl only (TA Canton)	7470 Mercury (TA Canton)	9012 Cyanide (TA Canton)	***** Send Samples to TestAmerica Canton *****	Total Number of containers	Special Instructions/Note:
			Preservation Code:												
MW6-020618-1655	2/6/18	1655	G	W	N	(Y)	X	X	X	X	X	X		7	Send Samples to TestAmerica Canton MS/MSD
4479-020618-0001	2/6/18	1600	G	W	N	N	X							2	Trip Blank
MW8D-020718-1025	2/7/18	1025	G	W	N	N	X	X	X	X	X	X		7	
MW8S-020718-1230	2/7/18	1230	G	W	N	N	X	X	X	X	X	X		7	
MW7D-020718-1023	2/7/18	1023	G	W	N	N	X	X	X	X	X	X		7	
MW7S-020718-1203	2/7/18	1203	G	W	N	N	X	X	X	X	X	X		7	
MWK09S-020718-1445	2/7/18	1445	G	W	N	N	X	X	X	X	X	X		7	
MWK09D-020718-1553	2/7/18	1553	G	W	N	N	X	X	X	X	X	X		7	
4413-020718-0001	2/7/18	—	G	W	N	N	X	X	X	X	X	X		7	Field Dup

240-91369 Chain of Custody

210 Dayton

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements: *****Ohio VAP*****

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 2/9/18 10:10	Company: H+A	Received by: ME Miley	Date/Time: 2-9-18 1010	Company: TA
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by: ME Miley	Date/Time: 2-9-18 1600	Company: TA	Received by:	Date/Time: 2/10/18 800	Company: TAC

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks

2.4/2.1 1.4/1.1 5.0/4.7
4.4/4.1 3.0/2.7

TestAmerica CANTON
send samples to TestAmerica CANTON
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

[redacted]

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: T. Dennison + J. Gerger	Lab PM: Brown, Shali 615-301-5031	Carrier Tracking No(s):	COC No:
Client Contact: Kristen Wright-NG	Phone:	E-Mail: shali.brown@testamericainc.com		Page:
Company: Haley & Aldrich, Inc. for (DUKE ENERGY)				Job #:
Address: 8899 Gander Creek Drive	Due Date Requested:			
City: Miamisburg	TAT Requested (days): STD			
State, Zip: Ohio				
Phone: 703-336-6215	PO #: 131783-003			
Email: KWright-NG@haleyaldrich.com	WO #:			
Project Name: East End Gas Works	Project #: 49006334			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260 Volatiles Custom List (TA Canton)	8270 PAH_LL List (TA Canton)	6010 TAL Metals (no Sb or Tl) (TA Canton)	6020 Sb and Tl only (TA Canton)	7470 Mercury (TA Canton)	9012 Cyanide (TA Canton)	***** Send Samples to TestAmerica Canton *****	Total Number of containers	Special Instructions/Note:
			Preservation Code:												Send Samples to TestAmerica Canton
MW19S-020818-0929	2/8/18	0929	G	W	N	N	X	X	X	X	X	X			
MW21D-020818-1119	2/8/18	1119	G	W	N	N	X	X	X	X	X	X			
MW25D-020818-1335	2/8/18	1335	G	W	N	N	X	X	X	X	X	X			
MW213-020818-1430	2/8/18	1430	G	W	N	N	X	X	X	X	X	X			
TW1S-020818-0959	2/8/18	0959	G	W	N	N	X	X	X	X	X	X			
TW2I-020818-1135	2/8/18	1135	G	W	N	N	X	X	X	X	X	X			
MW3DR-020818-1423	2/8/18	1423	G	W	N	N	X	X	X	X	X	X			
MW26S-020818-1620	2/8/18	1620	G	W	N	N	X	X	X	X	X	X			
4479-020818-0001	2/8/18	1230	G	W	N	N	X	X	X	X	X	X			Eq. Blank
4413-020818-0001	2/8/18	1230	G	W	N	N	X	X	X	X	X	X			Eq. Blank

210
Dayton

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements: *****Ohio VAP*****

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	2/9/18 1010	H+A	[signature]	2-9-18 1010	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by: [signature]	Date/Time: 2-9-18 1600	Company TA	Received by: [signature]	Date/Time: 2/10/18 800	Company TA

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Canton Sample Receipt Form/Narrative **Login # : 413/69**
Canton Facility

Client Haley & Aldrich Site Name _____ Cooler unpacked by: DcD
Cooler Received on 2/16/18 Opened on 2/16/18
FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____
Receipt After-hours: Drop-off Date/Time _____ Storage Location _____
TestAmerica Cooler # _____ Foam Box (Client Cooler) Box Other _____
Packing material used: ~~Bubble Wrap~~ Foam (Plastic Bag) None Other _____
COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-8 (CF **-0.3** °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #36 (CF **+0.3**°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   ~~IR GUN # 627 (CF **-1.3**°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C~~

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 each	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels be reconciled with the COC?	Yes	(No)
9. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
10. Sufficient quantity received to perform indicated analyses?	(Yes)	No
11. Are these work share samples?	Yes	(No)
If yes, Questions 12-16 have been checked at the originating laboratory.		
12. Were all preserved sample(s) at the correct pH upon receipt?	(Yes)	No NA pH Strip Lot# **HC730269**
13. Were VOAs on the COC?	(Yes)	No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Covered	(Yes)	No
16. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

Received Sample, "MW4DR-020718-1420", 02/07/18 @1420 not on COC. will log at end of job.

17. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

WI-NC-099

TestAmerica Multiple Cooler Receipt Form/Narrative
Canton Facility

Login # : 91369

Cooler #	IR Gun #	Observed Temp °C	Corrected Temp °C	Coolant
Client	8	2.4	2.1	Ice
↓	↓	4.4	4.1	↓
		1.4	1.1	
		3.0	2.7	
		5.0	4.7	

X:\X-Drive Document Control\SOPs\Work Instructions\Word Version Work Instructions\WI-NC-099H-071615 Cooler Receipt Form_page 2 - Multiple Coolers.doc rls

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
MW6-020618-1655	240-91369-P-1	Plastic 250ml - with Sodium Hydro	>12		
MW6-020618-1655	240-91369-Q-1	Plastic 250ml - with Sodium Hydro	>12		
MW6-020618-1655	240-91369-R-1	Plastic 250ml - with Sodium Hydro	>12		
MW6-020618-1655	240-91369-S-1	Plastic 250ml - with Nitric Acid	<2		
MW6-020618-1655	240-91369-T-1	Plastic 250ml - with Nitric Acid	<2		
MW6-020618-1655	240-91369-U-1	Plastic 250ml - with Nitric Acid	<2		
MW8D-020718-1025	240-91369-F-3	Plastic 250ml - with Sodium Hydro	>12		
MW8D-020718-1025	240-91369-G-3	Plastic 250ml - with Nitric Acid	<2		
MW8S-020718-1230	240-91369-F-4	Plastic 250ml - with Sodium Hydro	>12		
MW8S-020718-1230	240-91369-G-4	Plastic 250ml - with Nitric Acid	<2		
MW7D-020718-1023	240-91369-F-5	Plastic 250ml - with Sodium Hydro	>12		
MW7D-020718-1023	240-91369-G-5	Plastic 250ml - with Nitric Acid	<2		
MW7S-020718-1203	240-91369-F-6	Plastic 250ml - with Sodium Hydro	>12		
MW7S-020718-1203	240-91369-G-6	Plastic 250ml - with Nitric Acid	<2		
MWK09S-020718-1445	240-91369-F-7	Plastic 250ml - with Sodium Hydro	>12		
MWK09S-020718-1445	240-91369-G-7	Plastic 250ml - with Nitric Acid	<2		
MWK09D-020718-1553	240-91369-F-8	Plastic 250ml - with Sodium Hydro	>12		
MWK09D-020718-1553	240-91369-G-8	Plastic 250ml - with Nitric Acid	<2		
4413-020718-0001	240-91369-F-9	Plastic 250ml - with Sodium Hydro	>12		
4413-020718-0001	240-91369-G-9	Plastic 250ml - with Nitric Acid	<2		
MW19S-020818-0929	240-91369-F-10	Plastic 250ml - with Sodium Hydro	>12		
MW19S-020818-0929	240-91369-G-10	Plastic 250ml - with Nitric Acid	<2		
MW21D-020818-1119	240-91369-F-11	Plastic 250ml - with Sodium Hydro	>12		
MW21D-020818-1119	240-91369-G-11	Plastic 250ml - with Nitric Acid	<2		
MW25D-020818-1335	240-91369-F-12	Plastic 250ml - with Sodium Hydro	>12		
MW25D-020818-1335	240-91369-G-12	Plastic 250ml - with Nitric Acid	<2		
MW21S-020818-1430	240-91369-F-13	Plastic 250ml - with Sodium Hydro	>12		
MW21S-020818-1430	240-91369-G-13	Plastic 250ml - with Nitric Acid	<2		
TW1S-020818-0959	240-91369-F-14	Plastic 250ml - with Sodium Hydro	>12		
TW1S-020818-0959	240-91369-G-14	Plastic 250ml - with Nitric Acid	<2		
TW2I-020818-1135	240-91369-F-15	Plastic 250ml - with Sodium Hydro	>12		
TW2I-020818-1135	240-91369-G-15	Plastic 250ml - with Nitric Acid	<2		
MW3DR-020818-1423	240-91369-F-16	Plastic 250ml - with Sodium Hydro	>12		
MW3DR-020818-1423	240-91369-G-16	Plastic 250ml - with Nitric Acid	<2		
MW26S-020818-1620	240-91369-F-17	Plastic 250ml - with Sodium Hydro	>12		
MW26S-020818-1620	240-91369-G-17	Plastic 250ml - with Nitric Acid	<2		
4479-020818-0001	240-91369-F-18	Plastic 250ml - with Sodium Hydro	>12		

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
4479-020818-0001	240-91369-G-18	Plastic 250ml - with Nitric Acid	<2	_____	_____
4413-020818-0001	240-91369-F-19	Plastic 250ml - with Sodium Hydrox	>12	_____	_____
4413-020818-0001	240-91369-G-19	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW4DR-020718-1420	240-91369-F-20	Plastic 250ml - with Sodium Hydrox	>12	_____	_____
MW4DR-020718-1420	240-91369-G-20	Plastic 250ml - with Nitric Acid	<2	_____	_____

ANALYTICAL LABORATORY REQUEST FORM (ARF)

(1) Complete all yellow sections of this form. Move through by striking the "TAB" key.	
(2) Save the file & e-mail to:	labcustomer@duke-energy.com
Questions / Problems Call:	704-875-5245

Duke Energy Completes and sends ARF to the engineering firm

Customer Information

Your Name	Office Phone	Cell Phone
Todd Bachand	513-287-3427	513-800-3413
Project Name (Use Remediation&Decommissioning Site Names)		Your e-Mail Address
EEGW		todd.bachand@duke-energy.com

Duke Vendor Labs & Contact	Accounting Fields	
Test America: ***Candace.Bonham@testamericainc.com***	Accounting Type	Specific Accounting
~~*Pace:* ***Kevin.Herring@pacelabs.com***~~	Operating Unit	GDOH
~~*Acutest:* ***Andreac@accutest.com***~~	Project ID	OMGPESEND
~~*Prism:* ***Aovercash@prismlabs.com***~~	Activity ID	INVEST
	Account	253070
Also send copy to - labcustomer@duke-energy.com		

Sampling Information

Sampling Personnel / Contractor	Scheduled Sampling Date	Date Sample Kit Needed
Trina Dennison/ Haley Aldrich	Feb 5-9, 2018	1/30/2018

Shipping Address for Kit

Name	Phone	Mail Code
Haley & Aldrich, Inc. Attn: Greg Mowatt	734.358.4735	
Street Address - street address and town needed	State	Zip Code
Drop Off at Construction Trailer: 2801 Riverside Drive, Cincinnati	OH	45226

Reporting

Report Due Date	Additional Reports - .pdf file w/ Basic QC and EDD (spreadsheet) is Standard	
Standard	**Ohio VAP Affidavit required**, Equis-compatible EDD	
Report To (e-Mail Address 1)	Report To (e-Mail Address 2)	Report to (e-Mail Address 3)
kwright-ng@haleyaldrich.com	hmarch@haleyaldrich.com	todd.bachand@duke-energy.com

Project Specifics

Project Name	Program Type
EEGW Groundwater Sampling Q1 2018	Quarterly GW Sampling

Site, Location or Station	State	Approximate Number of Days Sampling is Scheduled
EEGW	Ohio	5

Notes, Special Requests, Required Contract Lab to use, etc.

Lab must be Ohio VAP certified. Must meet VAP standards and detection limits.

Engineering Firm Completes these sections and sends ARF to one of the Duke Vendor Lab Contacts listed above

Bottles	Matrix	Variables, Methods
22 samples (includes 17 well locations, 1 field duplicate, 1 MS, 1 MSD, 2 equipment blanks)	GW	VOCs (EPA 8260B), PAHs (8270C), Total Cyanide (9012A), TAL metals (EPA 6010B and 7040A no Sb or Tl,) TAL metals (6020 Sb and Tl only)
5	Water	VOC Trip Blanks
		IMPORTANT: Include QC samples (duplicates) with regular samples no need to separate

Brown, Shali

From: Wright-Ng, Kristen <KWright-Ng@haleyaldrich.com>
Sent: Friday, February 09, 2018 10:37 AM
To: Brown, Shali
Subject: Duke East End COC Correction

Importance: High

-External Email-

Shali-

One of the samples did not make it on the Chain of Custody at the Duke East End site. The samples were dropped off at the Dayton currier. Can you please correct this and send me an email confirmation?

Sample: MW4DR-020718-1420
Collection time: 14:20
Collection date: 2/7/18

Kristen Wright-Ng
Project Manager

Haley & Aldrich, Inc.

T: 703.336.6215
C: 860.462.4057

www.haleyaldrich.com

APPENDIX C

Laboratory Affidavits

Affidavit of VAP Certified Laboratory

[For VAP certified laboratories to attest to "certified data" under OAC 3745-300-13(N) and OAC 3745-300-04(A). Note that Ohio EPA is to receive a legible copy of the CL's affidavit. The entity that received the CL's analytical report under affidavit may retain the CL's affidavit original.]

State of Indiana)
) ss:
County of Marion)

I, Lyle Cable, being first duly sworn according to law, state that, to the best of my knowledge, information and belief:

1. I am an adult over the age of eighteen years old and competent to testify herein.

2. I am employed by Pace Analytical Services - Indianapolis ("the laboratory") as Quality Assurance Analyst. I am authorized to submit this affidavit on behalf of the laboratory.

3. The purpose of this submission is to support a request for a no further action letter or other aspects of a voluntary action, under Ohio's Voluntary Action Program (VAP) as set forth in Ohio Revised Code Chapter 3746 and Ohio Administrative Code (OAC) Chapter 3745-300.

4. Pace Analytical Services - Indianapolis performed analyses for Duke Energy for a voluntary action at property known as J18050453 EEGW / 131783-002.

5. This affidavit applies to and is submitted with the following information, data, documents or reports for the property:

Document ID	Date of Document
50196507	June 06, 2018

6. Pace Analytical Services - Indianapolis was a VAP certified laboratory pursuant to OAC 3745-300-04 when it performed the analyses referenced herein.

7. All analyses under this affidavit consist of VAP "certified data" as described in OAC 3745-300-04(A) - - unless paragraph b., below, specifies the exceptions:

   a. The laboratory performed the analyses within its current VAP certification, number CL0065. The laboratory was certified for each analyte, parameter group and method used at the time that it performed the analyses – see Method Cross Reference Table. The analyses were performed consistent with the laboratory's standard operating procedures and quality assurance program plan as approved under OAC 3745-300-04.

   b. Exceptions, if any: Any soil moisture performed by method SM 2540G used for dry weight correction of data or any analysis used for batch QC on matrix spikes, matrix spike duplicates or sample duplicates that are not associated with the referenced project number identified in item 5 above. The analyses specified below (a) may not have been or were not performed consistent with laboratory's procedures as required by its Ohio EPA-approved SOP or QAPP, or (b) are not encompassed by VAP's certified lab program.

Certified Lab Affidavit Pursuant to OAC 3745-300-13(N)
Page 2

Sample Number / Document ID	Analyte / Parameter Group	Method
50196507001 - 50196507008	Magnesium	6010B

8. The information, data, documents and reports identified under this affidavit are true, accurate and complete.

Further affiant sayeth naught.

Signature of Affiant

Sworn to before me and subscribed in my presence this 13th day of June, 2018

Melissa Lynn Albertson
Notary Public Seal State of Indiana
Marion County
Commission # 710839
My Commission Expires 02/25/2026

Notary Public

50196507

Revised 5/09, 8/09, 4/11; consistent with OAC 3745-300-04 (10/14/06, and rev. eff. 3/1/09 versions)

Affidavit of VAP Certified Laboratory

[For VAP certified laboratories to attest to "certified data" under OAC 3745-300-13(N) and OAC 3745-300-04(A). Note that Ohio EPA is to receive a legible copy of the CL's affidavit. The entity that received the CL's analytical report under affidavit may retain the CL's affidavit original.]

State of Indiana)
) ss:
County of Marion)

I, Lyle Cable, being first duly sworn according to law, state that, to the best of my knowledge, information and belief:

1. I am an adult over the age of eighteen years old and competent to testify herein.

2. I am employed by Pace Analytical Services - Indianapolis ("the laboratory") as Quality Assurance Analyst. I am authorized to submit this affidavit on behalf of the laboratory.

3. The purpose of this submission is to support a request for a no further action letter or other aspects of a voluntary action, under Ohio's Voluntary Action Program (VAP) as set forth in Ohio Revised Code Chapter 3746 and Ohio Administrative Code (OAC) Chapter 3745-300.

4. Pace Analytical Services - Indianapolis performed analyses for Duke Energy for a voluntary action at property known as J18050452 EEGW / 131783-002.

5. This affidavit applies to and is submitted with the following information, data, documents or reports for the property:

Document ID	Date of Document
50196517	June 06, 2018

6. Pace Analytical Services - Indianapolis was a VAP certified laboratory pursuant to OAC 3745-300-04 when it performed the analyses referenced herein.

7. All analyses under this affidavit consist of VAP "certified data" as described in OAC 3745-300-04(A) - - unless paragraph b., below, specifies the exceptions:

   a. The laboratory performed the analyses within its current VAP certification, number CL0065. The laboratory was certified for each analyte, parameter group and method used at the time that it performed the analyses – see Method Cross Reference Table. The analyses were performed consistent with the laboratory's standard operating procedures and quality assurance program plan as approved under OAC 3745-300-04.

   b. Exceptions, if any: Any soil moisture performed by method SM 2540G used for dry weight correction of data or any analysis used for batch QC on matrix spikes, matrix spike duplicates or sample duplicates that are not associated with the referenced project number identified in item 5 above. The analyses specified below (a) may not have been or were not performed consistent with laboratory's procedures as required by its Ohio EPA-approved SOP or QAPP, or (b) are not encompassed by VAP's certified lab program.

Certified Lab Affidavit Pursuant to OAC 3745-300-13(N)
Page 2

Sample Number / Document ID	Analyte / Parameter Group	Method
50196517001 - 50196517011	Magnesium	6010B

8. The information, data, documents and reports identified under this affidavit are true, accurate and complete.

Further affiant sayeth naught.

Signature of Affiant

Sworn to before me and subscribed in my presence this 13th day of June, 2018.

Melissa Lynn Albertson
Notary Public Seal State of Indiana
Marion County
Commission # 710839
My Commission Expires 02/26/2026

Notary Public

50196517

Revised 5/09, 8/09, 4/11; consistent with OAC 3745-300-04 (10/14/06, and rev. eff. 3/1/09 versions)

Affidavit of VAP Certified Laboratory

[For VAP certified laboratories to attest to "certified data" under OAC 3745-300-13(N) and OAC 3745-300-04(A). Note that Ohio EPA is to receive a legible copy of the CL's affidavit. The entity that received the CL's analytical report under affidavit may retain the CL's affidavit original.]

State of Indiana)
) ss:
County of Marion)

I, Lyle Cable, being first duly sworn according to law, state that, to the best of my knowledge, information and belief:

1. I am an adult over the age of eighteen years old and competent to testify herein.

2. I am employed by Pace Analytical Services - Indianapolis ("the laboratory") as Quality Assurance Analyst. I am authorized to submit this affidavit on behalf of the laboratory.

3. The purpose of this submission is to support a request for a no further action letter or other aspects of a voluntary action, under Ohio's Voluntary Action Program (VAP) as set forth in Ohio Revised Code Chapter 3746 and Ohio Administrative Code (OAC) Chapter 3745-300.

4. Pace Analytical Services - Indianapolis performed analyses for Duke Energy for a voluntary action at property known as J18080592 EEGW.

5. This affidavit applies to and is submitted with the following information, data, documents or reports for the property:

Document ID	Date of Document
50203645	August 30, 2018

6. Pace Analytical Services - Indianapolis was a VAP certified laboratory pursuant to OAC 3745-300-04 when it performed the analyses referenced herein.

7. All analyses under this affidavit consist of VAP "certified data" as described in OAC 3745-300-04(A) - - unless paragraph b., below, specifies the exceptions:

   a. The laboratory performed the analyses within its current VAP certification, number CL0065. The laboratory was certified for each analyte, parameter group and method used at the time that it performed the analyses – see Method Cross Reference Table. The analyses were performed consistent with the laboratory's standard operating procedures and quality assurance program plan as approved under OAC 3745-300-04.

   b. Exceptions, if any: Any soil moisture performed by method SM 2540G used for dry weight correction of data or any analysis used for batch QC on matrix spikes, matrix spike duplicates or sample duplicates that are not associated with the referenced project number identified in item 5 above. The analyses specified below (a) may not have been or were not performed consistent with laboratory's procedures as required by its Ohio EPA-approved SOP or QAPP, or (b) are not encompassed by VAP's certified lab program.

Certified Lab Affidavit Pursuant to OAC 3745-300-13(N)
Page 2

Sample Number / Document ID	Analyte / Parameter Group	Method
50203645001 – 50203645005	Magnesium	EPA 6010B
50203645007 – 50203645020	Magnesium	EPA 6010B

8. The information, data, documents and reports identified under this affidavit are true, accurate and complete.

Further affiant sayeth naught.

Signature of Affiant

Sworn to before me and subscribed in my presence this 18th day of September 2018.

Melissa Lynn Albertson
Notary Public Seal State of Indiana
Marion County
Commission # 710839
My Commission Expires 02/26/2026

Notary Public

50203645

Revised 5/09, 8/09, 4/11; consistent with OAC 3745-300-04 (10/14/06, and rev. eff. 3/1/09 versions)

Affidavit of VAP Certified Laboratory

[For VAP certified laboratories to attest to "certified data" under OAC 3745-300-13(N) and OAC 3745-300-04(A). Note that Ohio EPA is to receive a legible copy of the CL's affidavit. The entity that received the CL's analytical report under affidavit may retain the CL's affidavit original.]

State of Indiana)
) ss:
County of Marion)

I, Beth Schrage, being first duly sworn according to law, state that, to the best of my knowledge, information and belief:

1. I am an adult over the age of eighteen years old and competent to testify herein.

2. I am employed by Pace Analytical Services - Indianapolis ("the laboratory") as Quality Manager. I am authorized to submit this affidavit on behalf of the laboratory.

3. The purpose of this submission is to support a request for a no further action letter or other aspects of a voluntary action, under Ohio's Voluntary Action Program (VAP) as set forth in Ohio Revised Code Chapter 3746 and Ohio Administrative Code (OAC) Chapter 3745-300.

4. Pace Analytical Services - Indianapolis performed analyses for Duke Energy for a voluntary action at property known as J 18100763 Duke EEGW.

5. This affidavit applies to and is submitted with the following information, data, documents or reports for the property:

Document ID	Date of Document
50208819	November 9, 2018

6. Pace Analytical Services - Indianapolis was a VAP certified laboratory pursuant to OAC 3745-300-04 when it performed the analyses referenced herein.

7. All analyses under this affidavit consist of VAP "certified data" as described in OAC 3745-300-04(A) - - unless paragraph b., below, specifies the exceptions:

   a. The laboratory performed the analyses within its current VAP certification, number CL0065. The laboratory was certified for each analyte, parameter group and method used at the time that it performed the analyses – see Method Cross Reference Table. The analyses were performed consistent with the laboratory's standard operating procedures and quality assurance program plan as approved under OAC 3745-300-04.

   b. Exceptions, if any: Any soil moisture performed by method SM 2540G used for dry weight correction of data or any analysis used for batch QC on matrix spikes, matrix spike duplicates or sample duplicates that are not associated with the referenced project number identified in item 5 above. The analyses specified below (a) may not have been or were not performed consistent with laboratory's procedures as required by its Ohio EPA-approved SOP or QAPP, or (b) are not encompassed by VAP's certified lab program.

Certified Lab Affidavit Pursuant to OAC 3745-300-13(N)
Page 2

Sample Number / Document ID	Analyte / Parameter Group	Method
50208819001 – 005, 007 - 018	Magnesium	EPA 6010B

8. The information, data, documents and reports identified under this affidavit are true, accurate and complete.

Further affiant sayeth naught.

Signature of Affiant

Sworn to before me and subscribed in my presence this 12th day of November, 2018.

Melissa Lynn Albertson
Notary Public Seal State of Indiana
Marion County
Commission # 710839
My Commission Expires 02/25/2026

Notary Public

50208819

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 2

Section A — Required Client Information:

Company: Haley & Aldrich
Address: 2801 Riverside Drive
Cincinnati, OH 45226
Email: KWright-Ng@haleyaldrich.com
Phone: Fax:
Requested Due Date: STD

Section B — Required Project Information:

Report To: Kristen Wright-Ng
Copy To:
Purchase Order #:
Project Name: Duke EEGW
Project #:

Section C — Invoice Information:

Attention:
Company Name: Duke_Haley & Aldrich
Address:
Pace Quote:
Pace Project Manager: tina.sayer@pacelabs.com
Pace Profile #: 6831

Regulatory Agency:
State / Location: OH

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: VOC by 8260	MEEP RSK-175 (MN)	PAH by 8270SIM	6010 Metals**	6020- Sb, Tl only	Cyanide 9012	Residual Chlorine (Y/N)	5028819
	MATRIX: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS																	N								
1	MW6-102318-1620	WT	G			10/23/18	1620		7	2		1	3	1					X		X	X	X	X		001
2	MW7S-102418-0943	WT	G			10/24/18	0943		7	2		1	3	1					X		X	X	X	X		002
3	MW7D-102418-1105	WT	G			10/24/18	1105		7	2		1	3	1					X		X	X	X	X		003
4	MW19S-102418-1322	WT	G			10/24/18	1322		21 6	2		3	3 3	3					X		X	X	X	X		MS/MSD 004
5	MW4DR-102418-1544	WT	G			10/24/18	1544		7	2		1	3	1					X		X	X	X	X		005
6	4479-102318-0001	WT	G			10/23/18	1500												X							006
7	4479-102418-0002	WT	G			10/24/18	1645		7	2		1	3	1					X		X	X	X	X		007
8	MW3DR-102518-1039	WT	G			10/25/18	1039		7	2		1	3	1					X		X	X	X	X		008
9	MW8S-102318-1631	WT	G			10/23/18	1631		7	2		1	3	1					X		X	X	X	X		009
10	MWK09S-102418-1528	WT	G			10/24/18	1528		7	2		1	3	1					X		X	X	X	X		010
11	MW K09D-102418-1705	WT	G			10/24/18	1705		7	2		1	3	1					X		X	X	X	X		011
12	MW2D-102418-0930	WT	G			10/24/18	0930		7	2		1	3	1					X		X	X	X	X		012

ADDITIONAL COMMENTS

**6010-Al, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Ni, K, Se, Ag, Na, V, Zn

OHIO VAP

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Tina Dennison	10/25/18	1630	FedEx		
Fedex	10/26/18	0830	Lucas W Simpson	10/26/18	0830

SAMPLE CONDITIONS

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.4			
0.4°C	Y	Y	Y
0.4°C			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tina Dennison

SIGNATURE of SAMPLER: Tina Dennison

DATE Signed: 10/25/18

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 2 Of 2

Section A — Required Client Information:

Company: Haley & Aldrich
Address: 2801 Riverside Drive
Cincinnati, OH 45226
Email: KWright-Ng@haleyaldrich.com
Phone: Fax:
Requested Due Date: STD

Section B — Required Project Information:

Report To: Kristen Wright-Ng
Copy To:
Purchase Order #:
Project Name: Duke EEGW
Project #:

Section C — Invoice Information:

Attention:
Company Name: Duke_Haley & Aldrich
Address:
Pace Quote:
Pace Project Manager: tina.sayer@pacelabs.com,
Pace Profile #: 6831

Regulatory Agency:
State / Location: OH

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	START TIME	END DATE	END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	VOC by 8260	MEEP RSK-175 (MN)	PAH by 8270SIM	6010 Metals**	6020- Sb, Ti only	Cyanide 9012	Residual Chlorine (Y/N)	5028819
1	9583-102418-0001	WT	G			—	—		7	2		1	3	1					X		X	X	X	X		Field Dup 013
2	MW21D-102418-1110	WT	G			10/24/18	1110		7	2		1	3	1					X		X	X	X	X		014
3	MW21S-102518-0920	WT	G			10/25/18	0920		7	2		1	3	1					X		X	X	X	X		015
4	MW25D-102518-1113	WT	G			10/25/18	1113		7	2		1	3	1					X		X	X	X	X		016
5	9583-102518-0001	WT	G			10/25/18	0850		7	2		1	3	1					X		X	X	X	X		017
6	TW2I-102518-1240	WT	G			10/25/18	1240		7	2		1	3	1					X		X	X	X	X		018
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS: **6010-Al,As,Ba,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Hg, Mg,Mn,Ni,K,Se,Ag,Na,V,Zn

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Tina Dennison/H&A	10/25/18	1630	Fed Ex		
Fedex	10/26/18	0830	Lucas W Gaynor	10/26/18	0830

SAMPLE CONDITIONS

TEMP in C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.4C			
0.4C	Y	Y	Y
0.4C			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tina Dennison

SIGNATURE of SAMPLER: Tina Dennison

DATE Signed: 10/25/18

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 5028819

Date/Time and Initials of person examining contents: LWG 10/26/18 1245

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other _____

Tracking #: 4558 7046 9260

Custody Seal on Cooler/Box Present: ☑ Yes ☐ No Seals Intact: ☑ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other _____

Thermometer: 1 2 3 4 5 6 A (B) C D E F Ice Type: ☑ Wet ☐ Blue ☐ None | Samples collected today and on ice: ☐ Yes ☐ No ☑ N/A

Cooler Temperature: 0.4°C/0.4°C, 0.4°C/0.4°C, 1.4°C Ice Visible in Sample Containers?: ☐ Yes ☑ No ☐ N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: ☐ Yes ☐ No ☑ N/A

All discrepancies will be written out in the comments section below.

	Yes	No
Are samples from West Virginia? Document any containers out of temp.		✓
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		✓
Chain of Custody Present:	✓	
Chain of Custody Filled Out:	✓	
Short Hold Time Analysis (<72hr)?: **Analysis:**		✓
Time 5035A TC placed in Freezer or Short Holds To Lab:		
Rush TAT Requested:		✓
Containers Intact?:	✓	
Sample Label (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID	✓	

	Yes	No	N/A
All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted. Circle: (HNO3) H2SO4 (NaOH) NaOH/ZnAc	✓		
Dissolved Metals field filtered?:		✓	
Headspace Wisconsin Sulfide			✓
	Present	Absent	N/A
Residual Chlorine Check (SVOC 625 Pest/PCB 608)		✓	
Residual Chlorine Check (Total/Amenable/Free Cyanide)		✓	
Headspace in VOA Vials (>6mm):	✓		
Trip Blank Present?:	✓		
Trip Blank Custody Seals?:	✓		

Comments:

H.S. Samples ~~MW4C~~ LWG MW7D VG9H 1/3, MW4DR 3/3 VG9H, MW3DR 1/G9H 2/3, MW8D VG9H 3/3, TW2I VG9H 3/3 - LWG 10/26/18

Sample Container Count

CLIENT: Haley & Aldrich

COC PAGE 1 of 2

COC ID#

Project # 502888.19

Sample Line Item	DG9H / VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	SBS Bulk Kit R	DI	Matrix S/Wt/NAL (Soil/Water/Non-Aqueous Liquid)	pH <2	pH >9	pH>12
1	3	2											1	1					W	✓		✓
2																						
3																						
4	9	6											3	3								
5	3																					
6		2											1	1								
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass
DG9H	40mL HCL amber voa vial	AG1H	1 liter HCL amber glass
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpreserved amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass
WGKU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
		BG3U	250mL Unpreserved Clear Glass

Plastic / Misc.

BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
BP1S	1 liter H2SO4 plastic		
BP1U	1 liter unpreserved plastic	AF	Air Filter
BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
BP2O	500mL NaOH plastic	U	Summa Can
BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
BP2U	500mL unpreserved plastic		
BP2Z	500mL NaOH, Zn Ac		
BP3B	250mL NaOH plastic		
BP3N	250mL HNO3 plastic		
BP3S	250mL H2SO4 plastic		

Sample Container Count

WO# : 50208819

CLIENT: _____

COC PAGE 2 of 2

COC ID# _____

Project # 50208819

Sample Line Item	DG9H / VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Box R	Matrix (Soil/A Aquec	pH <2	pH >9	pH>12
1	3	2											1	1				W	✓		✓
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial
DG9H	40mL HCL amber voa vial
DG9M	40mL MeOH clear vial
DG9P	40mL TSP amber vial
DG9S	40mL H2SO4 amber vial
DG9T	40mL Na Thio amber vial
DG9U	40mL unpreserved **amber** vial
VG9H	40mL HCL clear vial
VG9T	40mL Na Thio. clear vial
VG9U	40mL unpreserved **clear** vial
VGFX	40mL w/hexane wipe vial
VSG	Headspace septa vial & HCL
WGKU	8oz unpreserved clear jar
WGFU	4oz clear soil jar
JGFU	4oz unpreserved amber wide

AG0U	100mL unpreserved amber glass
AG1H	1 liter HCL amber glass
AG1S	1 liter H2SO4 amber glass
AG1T	1 liter Na Thiosulfate amber glass
AG1U	1liter unpreserved amber glass
AG2N	500mL HNO3 amber glass
AG2S	500mL H2SO4 amber glass
AG2U	500mL unpreserved amber glass
AG3S	250mL H2SO4 glass amber
AG3U	250mL unpreserved amber glass
BG1H	1 liter HCL clear glass
BG1S	1 liter H2SO4 clear glass
BG1T	1 liter Na Thiosulfate clear glass
BG1U	1 liter unpreserved glass
BG3H	250mL HCl Clear Glass
BG3U	250mL Unpreserved Clear Glass

Plastic / Misc.

BP1A	1 liter NaOH, Asc Acid plastic
BP1N	1 liter HNO3 plastic
BP1S	1 liter H2SO4 plastic
BP1U	1 liter unpreserved plastic
BP1Z	1 liter NaOH, Zn, Ac
BP2A	500mL NaOH, Asc Acid plastic
BP2N	500mL HNO3 plastic
BP2O	500mL NaOH plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Ac
BP3B	250mL NaOH plastic
BP3N	250mL HNO3 plastic
BP3S	250mL H2SO4 plastic
BP3U	250mL unpreserved plastic
BP3Z	250mL NaOH, Zn Ac plastic

AF	Air Filter
C	Air Cassettes
R	Terra core kit
SP5T	120mL Coliform Na Thiosulfate
U	Summa Can
ZPLC	Ziploc Bag

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Affidavit of VAP Certified Laboratory

State of Ohio)
) ss:
County of Stark)

I, Justin D. Ross being first duly sworn according to law, state that, to the best of my knowledge, information and belief:

1. I am an adult over the age of eighteen years old and competent to testify herein.

2. I am employed by TestAmerica Laboratories, Inc. ("the laboratory") as Project Management Assistant. I am authorized to submit this affidavit on behalf of the laboratory.

3. The purpose of this submission is to support a request for a no further action letter or other aspects of a voluntary action, under Ohio's Voluntary Action Program (VAP) as set forth in Ohio Revised Code Chapter 3746 and Ohio Administrative Code (OAC) Chapter 3745-300.

4. TestAmerica Canton performed analyses for **Duke Energy Corporation,** for a voluntary action at property known as **East End Gas Works, 2801 Riverside Drive, Cincinnati, OH 45202.**

5. This affidavit applies to and is submitted with the following information, data, documents or reports for the property:

Document ID	Date of Document
240-91369-1	**February 27, 2018**

6. TestAmerica Canton was a VAP certified laboratory pursuant to OAC 3745-300-04 when it performed the analyses referenced herein.

7. All analyses under this affidavit consist of VAP "certified data" as described in OAC 3745-300-04(A) - - unless paragraph b., below, specifies the exceptions:

   a. The laboratory performed the analyses within its current VAP certification. The laboratory was certified for each analyte, parameter group and method used at the time that it performed the analyses. The analyses were performed consistent with the laboratory's standard operating procedures and quality assurance program plan as approved under OAC 3745-300-04.

   b. Exceptions, if any:

Sample Number / Document ID	Analyte / Parameter Group	Method
Samples 1, 3-20 / 240-91369-1	Magnesium	SW846 6010B

Certified Lab Affidavit Pursuant to OAC 3745-300-13(N)
Page 2

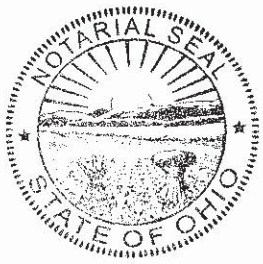
8. The information, data, documents and reports identified under this affidavit are true, accurate and complete.

Further affiant sayeth naught.

Signature of Affiant

Sworn to before me and subscribed in my presence this 28 day of February, 2018.

Dawn Knight
Notary Public



Dawn Knight
Notary Public, State of Ohio
My Commission Expires 09-29-2019

www.haleyaldrich.com

PHASE II PROPERTY ASSESSMENT WORK PLAN
ADDITIONAL SEDIMENT INVESTIGATION OF OHIO RIVER
DUKE WEST END FORMER MANUFACTURED GAS PLANT
646 MEHRING WAY
CINCINNATI, OHIO

by
Haley & Aldrich, Inc.
Cleveland, Ohio

for
Duke Energy Ohio, Inc.
Cincinnati, Ohio

File No. 128218
August 2019

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

19 August 2019
File No. 128218-003

Duke Energy Ohio, Inc.
139 East 4th Street / EM740
Cincinnati, Ohio 45202

Attention: Todd Bachand

Subject: Phase II Property Assessment Work Plan
Additional Sediment Investigation of Ohio River
Duke West End Former Manufactured Gas Plant
646 Mehring Way
Cincinnati, Ohio

Dear Mr. Bachand,

On behalf of Duke Energy Ohio, Inc. (Duke), Haley & Aldrich, Inc. (Haley & Aldrich) has prepared the enclosed Phase II Property Assessment Sediment Investigation Work Plan (Work Plan), for additional sediment investigation activities within the Ohio River at the Duke West End Former Manufactured Gas Plant ("West End" or the "Site"), located at 646 Mehring Way in Cincinnati, Ohio (Figure 1) under the Ohio Environmental Protection Agency (OEPA), Voluntary Action Program (VAP). This Work Plan describes the proposed supplemental sediment pre-design investigations at the Site, which was formerly a manufactured gas plant (MGP). The investigations are intended to further evaluate whether the sediments meet applicable standards under the VAP, including potential human health and ecological risk predicted through screening using previously generated delineation data and inform remedial planning and design where warranted.

If you have any questions or comments regarding this document, please do not hesitate to contact us.

Sincerely yours,
HALEY & ALDRICH, INC.

Shawn S. Fiore

Shawn S. Fiore, C.P., P.G.
Senior Vice President

Helder Costa

Helder Costa
Principal Consultant and Sediment Practice Leader

Enclosures

\\haleyaldrich.com\share\CF\Projects\128218\003 Sediment\Work Plan\Deliverable\2019-0819-WEMGP_Sediment_Work_Plan-F.docx

HALEY & ALDRICH, INC.
6500 ROCKSIDE ROAD
SUITE 200
CLEVELAND, OH 44131
216.739.0555

SIGNATURE PAGE FOR

VOLUNTARY ACTION PROGRAM
PHASE II PROPERTY ASSESSMENT WORK PLAN
ADDITIONAL SEDIMENT INVESTIGATION OF OHIO RIVER
DUKE WEST END FORMER MANUFACTURED GAS PLANT
646 MEHRING WAY
CINCINNATI, OHIO

PREPARED FOR
DUKE ENERGY OHIO, INC.
CINCINNATI, OHIO

PREPARED BY:

Kristen Wright-Ng
Project Manager
Haley & Aldrich, Inc.

REVIEWED AND APPROVED BY:

Shawn S. Fiore, C.P., P.G.
Senior Vice President
Haley & Aldrich, Inc.

Helder Costa
Principal Consultant/Sediment Practice Leader
Haley & Aldrich, Inc.

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HALEY ALDRICH

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1. Introduction

1.1 PURPOSE

Duke Energy Ohio, Inc. (Duke) is performing upland investigation and remediation activities, under the Ohio Environmental Protection Agency (OEPA) Voluntary Action Program (VAP), at the West End Former Manufactured Gas Plant (MGP) Site ("West End" or the "Site"). The purpose of this *Phase II Property Assessment Work Plan* is to provide details on the technical approach for assessing the conditions of the Ohio River adjacent to and part of the West End Site in a manner consistent with VAP requirements as described in the subsequent sections.

1.2 SITE SETTING

The Site is located at 646 Mehring Way in Cincinnati, Hamilton County, Ohio. West End was utilized for MGP operations from 1843 to 1909 and 1918 to 1928. Former MGP operations were located along a section of the northern bank of the Ohio River. West End includes two parcels situated immediately north of the Ohio River, just west of the downtown metropolitan area of Cincinnati, Ohio. Together, the two parcels occupy approximately 18 acres; are relatively flat with the exception of the southernmost edge of the property that slopes towards the river; and contain asphalt and gravel surfaces, buildings, high-voltage transmission towers, two high-voltage substations, and several transformer bays. The Brent Spence Bridge, which crosses the Ohio River connecting Cincinnati with northern Kentucky, traverses the far east side of the Site. The Brent Spence Bridge has a history of lead paint issues. In the early 1990s, the bridge was repainted, and sandblasting operations were suspended after high levels of lead were detected in air in Covington, KY.[1] The state was also fined for improper disposal of lead-contaminated sandblast debris. Plans to rehabilitate the existing bridge and build a new bridge to the west of the existing bridge is currently under discussion.[2,3]

The area surrounding the Site is primarily industrial and urban, with a number of large combined sewer overflows (CSO) and other point source discharges to the river upstream of the Site. In this area, the Ohio River is approximately 1,300 feet wide and is used for commercial and recreational boat navigation. The normal pool elevation (NPE) at the Site is 454.4 feet North American Vertical Datum of 1988 (NAVD88) and the Ordinary High Water Mark (OHWM) elevation is 467.1 feet NAVD88. A review of bathymetry data collected on behalf of Duke by Ocean Surveys, Inc., from February 14 through 16, 2017, indicates the sediment surface within the Site slopes south toward the navigation channel, approximately 30 feet vertically per 100 feet horizontally prior to flattening.

The riverbank at West End extends approximately 1,100 ft along the Ohio River with a steep slope. The top of bank is approximately 13 feet above the NPE. A concrete apron extends over approximately half of the bank, and cobbles, rocks, and vegetation intermittently cover the rest of the bank. The sediment sampling area, to date, extends from the upstream boundary of the Site to a distance of approximately 1,700 feet downstream. The background sampling area extends 2,000 feet upstream from the

[1] "Brent Spence Bridge (Interstates 71 and 75)" http://bridgestunnels.com/bridges/ohio-river/brent-spence-bridge-interstates-71-and-75/ Accessed 1 July 2019.
[2] "Brent Spence Bridge" https://en.wikipedia.org/wiki/Brent_Spence_Bridge Accessed 1 July 2019.
[3] "ODOT taking baby steps toward a new Brent Spence Bridge" https://www.wcpo.com/news/transportation-development/move-up-cincinnati/odot-taking-baby-steps-towards-a-new-brent-spence-bridge Accessed 1 July 2019.

investigation area. Refer to Figure 1 for areas of sediment sampling and background sampling. Sample collection areas are located within the State of Ohio portion of the Ohio River.

The Ohio River is a navigational waterway through the Midwest. To achieve reliable navigational depths, in 1929, a canalization project was completed. The canalization project created a series of wicket dams and small locks to form pools. The low water elevation in 1919 was El. 433 (NGVD29). In the 1950s, the Ohio River Navigation Modernization Project was initiated to replace the outdated system of wicket dams and small locks with new concrete dams and adjoining larger locks. When the Ohio River Navigation Modernization Project was completed, the channels of the Ohio River were modified, including at the Site. The Markland Locks and Dam (Markland L&D), located at the Ohio and Indiana state line, was constructed between 1956 and 1964, and is operated by the U.S. Army Corps of Engineers Louisville District (ACOE). The Markland L&D is located downstream of the Site. Effective January 1, 1963, upon the activation of Markland Dam, the normal pool stage at Cincinnati was raised to El. 455 (NGVD29). As a result, a portion of West End is currently located within the Ohio River.

1.3 SUMMARY OF PREVIOUS OHIO RIVER ASSESSMENTS

1.3.1 2013 Sediment Investigation

From October through November 2013, Arcadis collected riverbed sediment samples from 16 boring locations during an investigation program. Samples were collected at depths ranging from 0.5 to 13 ft below the river bottom. A total of 10 sediment samples were analyzed for the following parameters at TestAmerica of North Canton, Ohio (a VAP-certified laboratory (CL)):

- Benzene, toluene, ethylbenzene, xylenes (BTEX) by United States Environmental Protection Agency (USEPA) Method 8260
- Total cyanide by USEPA Method 9012A
- Total petroleum hydrocarbons (TPH), diesel range organics (DRO), and extended range organics (ERO) by USEPA Method 8015B
- Total organic carbon (TOC), by Lloyd Kahn Method

Sediment samples were also analyzed for the following parameters at TestAmerica of Burlington, Vermont:

- polycyclic aromatic hydrocarbons (PAH) including 47 compounds comprised of parent PAHs, alkylated homologues and thiophenes by USEPA Method 8270 SIM
- grain size analysis by American Society for Testing and Materials (ASTM) Method D422 (for three samples of varying sediment types)

BTEX, PAHs, and/or DRO/ERO were detected in sediments at concentrations greater than reference locations at some locations. Additionally, non-liquid tar-like material (TLM) was observed in three sediment borings.

Arcadis advanced 12 TarGOST® probes as part of their sediment investigation. Overall TarGOST® fluorescence was low (ranging from 9.8% to 36.7%). The three highest TarGOST® responses were recorded at:

- TG-8 (25.3 %RE at 5.66 ft below sediment surface (bss)). At confirmation borings CB-8 and CB-8A, wood, odors, PID values up to 45.2 ppm, and TLM were observed.
- TG-14b (20.9 %RE at 6.77 ft bss). At confirmation boring CB-14, odors and PID values up to 2.3 ppm were observed.
- TB-15/15c (36.7 %RE at 2.62 ft and 28.9 %RE at 1.43 ft bss, respectively). At confirmation boring CB-15, odors and PID values up to 6.1 ppm were observed.

1.3.2 2017 Sediment Investigation

From June through December 2017, Anchor QEA conducted a river sediment sampling and analysis program along and within the Ohio River at and upstream of the Site. As a part of this study, 50 sediment cores were advanced 10 to 35 feet into the river bottom, with bottom of hole elevations ranging from 398 to 427 ft NAVD. In addition to the sediment cores, Anchor QEA collected soil samples at elevations above NPE, on the riverbank along the north side of the river, downstream, upstream and at the Site.

A total of 75 surface sediment samples (including 13 background surface sediment samples) and 11 riverbank material samples (including 1 background riverbank sample) were collected for laboratory analysis. In addition, six surface water samples were collected for analysis (including two upstream surface water samples). Samples were submitted to TestAmerica, the project VAP CL for the following parameters:

- Volatile organic compounds (VOC) by USEPA method 8260
- PAHs by USEPA method 8270
- RCRA metals by USEPA method 6010
- Total cyanide by USEPA Method 9012A

Specific samples were also analyzed for an alternative PAH method (for which the laboratory was not VAP-certified), SW846 8270 SIM, the results of which were anticipated to be used for forensic purposes.

1.3.3 Surface Water Quality

In 2017, surface water samples were collected by Anchor QEA. Surface water chemical concentrations from the Site were individually compared to the promulgated Ohio River Basin Aquatic Life Tier I values and Tier II criteria (OEPA, 2017) where available. In accordance with the OEPA guidance, any chemical concentrations exceeding respective outside mixing zone average (OMZA) values were then compared to outside mixing zone maximum (OMZM) criteria. Surface water concentrations did not exceed Ohio surface water quality standards for the protection of human health (both as a source of drinking water and as a source of bioaccumulation in fish).

1.3.4 Screening-Level Ecological Risk Assessment – Sediment

In April 2019, Haley & Aldrich reviewed previous human health and ecological risk assessment work performed by Anchor QEA. Based on our review, we concluded that potential human exposure to

sediments and subsequent risks were unlikely to be the primary drivers for any remedial action at the Site. In contrast, our review concluded that potential risks to the environment associated with sediment were a potential driver for remedial action. To better understand the potential significance of potential ecological risks, we completed a preliminary Level-II Screening Ecological Risk Assessment utilizing the data collected by Anchor QEA following OEPA ecological risk assessment guidance (OEPA, 2018). Site-specific analytical data from the upper 3-feet of sediment were used to evaluate the potential risk to benthic invertebrates for PAHs. With the exception of data labeled by Anchor QEA as rejected (R), all data within the Anchor QEA database were considered and used.

Potential risk to benthic organisms from PAHs in the upper 3-feet of sediment was evaluated based on Equilibrium Sediment Benchmarks (ESB) in accordance with USEPA (2003) guidance. This approach uses PAH concentrations and TOC content measured in the sediment samples (using the one-carbon model) to estimate PAH concentrations in sediment pore water. Estimated PAH concentrations in pore water were then compared to final chronic values (FCV) presented in USEPA (2003) guidance. Pore water concentrations estimated from detected concentrations of PAHs (i.e., non-detect values for PAHs were assumed to be zero) were divided by their respective FCV to obtain an Equilibrium Sediment Benchmark Toxic Unit (ESBTU). Total ESBTU greater than one predicts, based on USEPA's equilibrium partitioning sediment benchmarks guidance, potential risk to benthic invertebrates from exposure to bioavailable PAHs in the sediment pore water.

The results of the Level-II Screening Ecological Risk Assessment conservatively indicated that PAHs within the upper 3 feet of sediment at 20 river sediment stations previously sampled may pose risks to the benthic invertebrates. Three additional river sediment stations contained PAH concentrations that may pose risk, but over depths extending deeper than the upper 3 feet of sediment. The conservatism inherent in this screening level evaluation acknowledges that benthic invertebrates primarily burrow within the upper 6 inches of the sediment bed, but that scour and other sediment disturbances in addition to river-flow scour may expose sediments deeper than 6 inches. Further, a 3-foot sediment layer thickness is generally accepted as a conservative buffer from conditions that may be left in place without an engineered cap if current conditions within the buffer are demonstrated to not pose risk. Refer to Table 1 for a summary of stations with ESBTUs greater than 1 within the upper 3 feet of sediment.

In addition to PAHs, lead concentrations in some river sediments were higher than lead concentrations in upriver sediments, considered reference locations unaffected by the Site. It is possible that elevated lead concentrations in sediment are associated with the Brent Spence bridge (possibly lead-based paint flaking off this structure or associated with previous sandblasting/ painting operations) or another anthropogenic source(s). Refer to Table 1 for a summary of stations with elevated lead concentrations.

1.4 OBJECTIVES

The overarching goal of this sediment investigation is to further evaluate, in accordance with the VAP Phase II property assessment rules, the distribution and potential risk of MGP-related impacts in sediment based on the findings and interpretation of previous assessments described above. The investigation area and proposed station locations are shown in Figure 1; station coordinates are provided in Table 4. The specific objectives of the sediment investigation are as follows:

1. Generate vertical profiles of PAHs extending several feet below modeled scour depths (>0.5 ft bss), where potential ecological risk is conservatively predicted to exist, to evaluate potential

mitigation/remediation options as a function of whether conditions improve with depth (suitability for dredging) or worsen with depth (suitability for capping).

2. Characterize pore water within the upper 3-feet of sediment as an empirical measure of PAH concentrations in the pore water medium where the potential ecological risk is predicted using ESBTUs.
3. Empirically evaluate toxicity to freshwater benthic invertebrates across a range of stations where potential ecological risk was conservatively predicted to exist based on ESBTUs greater than 1, and pore water characterization confirms measured TUs greater than 1, plus upstream "background reference" stations.
4. Characterize lead concentrations in sediment. If elevated lead concentrations are detected, the bioavailability of lead should be determined through Acid Volatile Sulfide/Simultaneously Extracted Metals (AVS/SEM) analysis and the potential source of lead evaluated using scanning electron microscopy.
5. Collect ancillary data for sediments to inform potential mitigation/remediation options (e.g., grain size, moisture content/percent solids, specific gravity), if required.
6. Evaluate sediment lithology and previous interpretation of shallow bedrock in select locations.

2. Field Investigation and Sampling Activities

This Sediment Investigation Work Plan addresses the objectives identified in Section 1.3 and generally consists of completing shallow push or rotary sonic cores from a barge. Based on the results of the preliminary human health and ecological risk assessment, PAHs and lead in the top 3-feet of sediments will be assessed. Based on our evaluation of existing data, there are four categories of stations where additional analysis is warranted:

- **PAHs Only Station:** Station where PAH data in the upper 3 feet of sediment have ESBTUs greater than 1 but where lead data is less than background conditions (100 mg/kg). Five (5) stations in total.

- **Lead Only Station:** Station where lead data in the upper 3 feet of sediment exceed background conditions (100 mg/kg) but where ESBTUs are less than 1. Five (5) stations in total.

- **PAHs and Lead Station:** Station where PAH data in the upper 3 feet of sediment have ESBTUs greater than 1 and where lead data is either not available or exceed background conditions (100 mg/kg). Eighteen (18) stations in total.

- **Background station:** Station located upstream of the investigation area to provide statistical power in evaluating the toxicity test data. Five (5) of the six previously sampled background stations in total.

In addition, sonic borings will be advanced to bedrock at two previously sampled locations, where bedrock was interpreted at shallow elevations ranging from approximately 2 to 10 feet below the riverbed surface. These borings will be logged for lithology down to bedrock. Any layers of observed impacts that are potentially MGP-related will be opportunistically sampled for PAH analysis.

This section, Section 2, describes how samples will be collected for EcoRisk which is consistent among the four categories of stations where additional analysis is warranted. It also describes the collection of deep sonic borings, to bedrock, to evaluate lithology and interpretation of shallow bedrock.

2.1 SEDIMENT SAMPLING FOR POTENTIAL ECOLOGICAL RISK (OBJECTIVES 1 THROUGH 5)

As referenced in the OEPA Guidance on Evaluating Sediment Contaminant Results, sediment may pose potential risk to aquatic life if ESBTU is greater than 1. Figure 1 indicates previously sampled locations at which ESBTUs greater than 1 predict potential risk to benthic invertebrates based on PAH concentrations within the upper 3 ft of sediment, selected as a conservative depth beyond modeled scour depths (approximately 6 inches) throughout the investigation area. Figure 1 also indicates previously sampled locations at which lead data in the upper 3 ft exceeded background conditions.

This investigation will include sampling at those stations (Figure 1) with ESBTU greater than 1 within the upper 3 ft of sediment and/or at stations with known elevated lead concentrations. Figure 2A summarizes the field sediment sampling protocol for PAHs only stations describing three different options that may be considered to obtain pore water from the upper 3+ ft of sediment. Figure 2B provides the field sampling guidance for sediment collected for lead only stations, while Figure 2C summarizes the field sampling guidance for PAH and lead combined stations. The anticipated water

depth and river flow suggest that the best way to assure collocated surface and subsurface sediment and associated pore water is to collect sediment cores using sonic equipment down-pressure, with resonance only as needed to allow sufficient penetration to recover the upper 3+ ft of sediment. Multiple cores will be collected at each station to allow compositing sediment within specified depth intervals in order to generate sufficient volume of sediment (approximately 8 liters [L]) to centrifuge for pore water extraction (approximately 4 L), and for toxicity testing (approximately 4 L). Successful sampling at a station will require 4 to 6 sediment push cores, advanced using the rotary sonic tooling with a Kelly bar to advance 5-ft Lexan core liners, fitted to capture sediment at the depth of penetration. The 5-ft Lexan liners will be initially used at each station to attempt recovery of nominal 3-ft sediment cores. Photos will be taken of each extracted sediment core.

Core recovery will be estimated based on the length of the sediment recovered as a percentage of the penetration depth, e.g., 4-ft recovery from 5-ft penetration will be estimated as 80 percent recovery. Core depth intervals will be adjusted accordingly during logging and subsampling. The nominal recovery acceptable will be 60 percent, with a goal of 80 percent. Where all cores exhibit similar lithology, the sediment core with the greatest recovery from a given station will be logged in detail; the remaining cores will be logged to document the recovery and intervals subsampled for analysis and testing.

Core vertical subsectioning is described in the following sections. However, adjustments should be made based on field observations, but always maintaining a nominal “surface” interval, typically no more than 1 ft, and one or more “subsurface” intervals. The subsurface intervals will be adjusted when a notable change in lithology or apparent impacts, such as OLM or TLM, are observed. For example, a notable change in lithology occurring at 2.5 ft bss would warrant a surface interval of 0 to 1 ft, a subsurface interval of 1 to 2.5 ft, and 2.5 to 3 ft (or deeper to assure sufficient sample volumes).

Also, where continuous OLM or TLM impacts are observed within a target interval, that depth interval should only be sampled for PAH, TOC, grain size, moisture content, and specific gravity. Sampling for pore water extraction will bias any pore water characterization or toxicity testing due to the presence of OLM/TLM. Such conditions will be considered for mitigation or remedial action. In such cases, only one core from a station exhibiting such conditions need be sampled as the single core will generate sufficient sample volume, and remedial consideration would be based on a potential “worst case” condition if additional cores do not contain the same extent of OLM/TLM.

2.1.1 PAH Only Station Sampling Option 1

Apparent fine-sediment cores for PAH only analysis will be processed as summarized in Figure 2A. Overlying water will be drained from 4 to 6 cores with nominal 3-ft recovery, by drilling a drain hole above the sediment surface while cores are maintained upright. Each core liner will then be cut longitudinally and split open for logging and subsampling. When subsampling to composite a depth interval from the 4 to 6 cores, sediment in contact with the Lexan liner will not be used for chemical analysis or biological testing, due to potential cross-contamination concerns, but may be used for geotechnical characterization, e.g., grain size, specific gravity, moisture content/percent solids. The following depth intervals will be composited and subsampled as follows (Figure 2A):

- The top three intervals will be composited at the 0-1 ft, 1-2 ft, and 2-3 ft with each interval subsampled for:
  - One 1-gal ziploc bag for pore water extraction in the lab using centrifugation.
  - Two 1-gal ziploc bags for potential toxicity testing.

  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids, specific gravity.
- The bottom intervals, e.g., 3–4 ft and 4-5 ft, or 3 to bottom of core depth based on field judgment, will be composited separately and subsampled for:
  - One 4-oz glass jar for PAHs
  - One 4-oz glass jar for TOC
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids, specific gravity
  - No subsampling for pore water or toxicity testing will occur at this depth, and any deeper recovered sediment will be logged to the bottom of the core, but not subsampled for analysis unless there are indications of potential MGP impacts.
- Sediment in 1-gal ziploc bags shipped to the analytical lab, Pace Analytical, will be transferred into appropriate pre-cleaned containers at the lab for high-speed centrifugation to extract pore water:
  - Pore water extracted from each depth interval will be filtered and combined, or alternatively combined in a separatory funnel with particles allowed to settle and then flushed prior to aliquoting for dissolved organic carbon (DOC), and liquid-liquid extraction for analysis of PAHs.
  - Remaining sediment from each depth interval will be subsampled by the lab for PAHs and TOC.
- Sediment collected at the bottom intervals (one 4-oz jars for PAHs, one 4-oz jar for TOC, 1-gal ziploc filled halfway for grain size, moisture content/percent solids, and specific gravity) will also be shipped to Pace Analytical. All 2-gal toxicity samples from the top three 1-ft depth intervals will be shipped to Pacific Eco-Risk. Field teams will indicate on the chain-of-custody (COC) forms to hold grain size, toxicity, and geotechnical samples pending authorization.

2.1.2 PAH Only Station Sampling Option 2

Cores with coarse substrate may be at risk of losing pore water when the core liner is cut for logging and subsampling. Overlying water will be drained from 4 to 6 cores with nominal 3-ft recovery, by drilling a drain hole above the sediment surface while cores are maintained upright. While still upright, a drain hole will be drilled into each core at the base of the upper depth interval (e.g., 0 – 1-ft surface interval first, then 1 – 2-ft interval second, etc.), a Teflon tube inserted, and gravity draining or gentle suction using disposable syringes used to collect the pore water from each core at each depth interval. Pore water collected from a given depth interval from each core will be submitted as one pore water sample to Pace Analytical for filtering followed by analysis of PAHs and DOC. The nominal volume of pore water to be shipped to the analytical lab for analysis is approximately 250 mL. Upon completion of pore water draining, each core liner will then be cut longitudinally and split open for logging and subsampling. The following depth intervals will be composited and subsampled as follows (Figure 2A):

- 0 – 1 ft, 1 -2, and 2-3 ft depth intervals each subsampled:
  - Pore Water (via field draining prior to homogenization): ≥250-mL for PAHs and DOC.
  - Sediment: One 4-oz glass jar for PAHs
  - One 4-oz glass jar for TOC
  - Two 1-gal ziploc bags for potential toxicity testing.

  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
- Bottom depth intervals will be composited and subsampled:
  - Sediment: One 4-oz glass jar for PAHs
  - One 4-oz glass jar for TOC
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
  - No subsampling for pore water or toxicity testing will occur at this depth, and any deeper recovered sediment will be logged to the bottom of the core, but not subsampled for analysis.
- Pore water, PAH, TOC, grain size, moisture content/percent solids, and specific gravity samples will be shipped to Pace Analytical. All 2-gal toxicity samples will be shipped to Pacific Eco-Risk. Field teams will indicate on the COC forms to hold grain size, toxicity, and geotechnical samples pending authorization.

2.1.3 PAH Only Station Sampling Option 3

PAH cores with coarse substrate that when inspected, appear "dry" and with little or no potential to generate the nominal 250-mL pore water volume necessary to extract for PAHs and analyze for DOC will be processed as follows. Each core liner will be cut longitudinally and split open for logging and subsampling. Depth intervals where there should be a pore water phase, e.g., the surface 0 - 1-ft interval, will be sampled according to Option 1. "Dry" depth intervals will be composited and subsampled as follows (Figure 2A):

- 1-2, and 2-3 ft depth intervals (DRY) each subsampled:
  - Sediment: One 4-oz glass jar for PAHs
  - One 4-oz glass jar for TOC
  - Two 1-gal ziploc bags for potential toxicity testing.
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
- Bottom intervals will be composited and subsampled:
  - Sediment: One 4-oz glass jar for PAHs
  - One 4-oz glass jar for TOC
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
  - No subsampling for toxicity testing will occur at this depth, and any deeper recovered sediment will be logged to the bottom of the core, but not subsampled for analysis.
- Sediment PAH, TOC, and grain size, moisture content/percent solids, and specific gravity samples will be shipped to Pace Analytical. All 2-gal toxicity samples will be shipped to Pacific Eco-Risk. Field teams will indicate on the COC forms to hold grain size, toxicity, and geotechnical samples pending authorization.

2.1.4 Lead Only Station Sampling Option

Stations for lead only analysis will be processed as summarized in Figure 2B. Overlying water will be drained from 4 to 6 cores with nominal 3-ft recovery, by drilling a drain hole above the sediment surface while cores are maintained upright. Each core liner will then be cut longitudinally and split open for logging and subsampling. Note: AVS/SEM requires sampling sediment rapidly to minimize loss of volatile sulfides and collecting in a jar with a septum-containing cap to minimize headspace. Accordingly, AVS/SEM will be collected from the sediment core with the apparent greatest recovery at a given station. This same sediment core will be logged in detail.

The following depth intervals will be composited and subsampled as follows (Figure 2B) except for AVS/SEM as noted above:

- 0 – 1-ft, 1-2, and 2-3-ft depth intervals each subsampled:
  - Sediment: One 4-oz glass jar for lead (rush turnaround time) and microscopy
  - One 4-oz glass jar for TOC
  - One 4-oz glass jar with a septum-cap, minimizing headspace for AVS/SEM
  - Two 1-gal ziploc bags for potential toxicity testing.
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
- Bottom depth intervals will be composited and subsampled:
  - Sediment: One 4-oz glass jar for lead (rush turnaround time) and microscopy
  - One 4-oz glass jar for TOC
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
  - No subsampling for toxicity testing will occur at this depth, and any deeper recovered sediment will be logged to the bottom of the core, but not subsampled for analysis.
- Sediment lead, TOC, microscopy, AVS/SEM, and grain size, moisture content/percent solids, and specific gravity samples will be shipped to Pace Analytical and 2-gal toxicity samples will be shipped to Pacific Eco-Risk. Field teams will indicate on the COC forms to hold AVS/SEM, microscopy, grain size, toxicity, and geotechnical samples pending authorization.

2.1.5 PAH and Lead Combined Stations Sampling Option 1

Apparent fine-sediment cores for PAH and lead combined stations will be processed in a manner similar as discussed in section 2.1.1 and as summarized in Figure 2C. The following depth intervals will be composited (except for AVS/SEM) and subsampled as follows (Figure 2C):

- The top three intervals will be composited at the 0-1 ft, 1-2 ft, and 2-3 ft intervals with each interval subsampled:
  - One 1-gal ziploc bag for pore water extraction in the lab using centrifugation.
  - One 4-oz glass jar for lead (rush turnaround) and microscopy.
  - Note: From the sediment core with the greatest percent recovery, one 4-oz glass jar with a septum-cap, minimizing headspace for AVS/SEM
  - Two 1-gal ziploc bags for potential toxicity testing.

  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
- The bottom intervals will be composited and subsampled:
  - Sediment: One 4-oz glass jar for PAHs
  - One 4-oz glass jar for TOC
  - One 4-oz glass jar for lead (rush turnaround)
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
  - No subsampling for pore water or toxicity testing will occur at this depth, and any deeper recovered sediment will be logged to the bottom of the core, but not subsampled for analysis.
- Sediment in 1-gal ziploc bags shipped to the Pace Analytical will be transferred into appropriate pre-cleaned containers at the analytical lab for high-speed centrifugation to extract pore water:
  - Pore water extracted from each depth interval will be filtered and combined, and then analyzed for PAHs and DOC.
  - Remaining sediment from each depth interval will be subsampled by the lab for PAHs and TOC.
- Sediment collected at the bottom interval (one 4-oz glass jar for PAHs, one 4-oz glass jar for TOC, one 4-oz glass jar for lead, 1-gal ziploc filled halfway for grain size, moisture content/percent solids, and specific gravity) will also be shipped to Pace Analytical. All 2-gal toxicity samples will be shipped to Pacific Eco-Risk. Field teams will indicate on the COC forms to hold AVS/SEM, microscopy, grain size, toxicity, and geotechnical samples pending authorization.

2.1.6 PAH and Lead Combined Stations Sampling Option 2

Cores with coarse substrate that may be at risk of losing pore water when the core liner is cut for logging and subsampling will be processed in a manner similar as discussed in section 2.1.2 and as summarized in Figure 2C. The following depth intervals will be composited (except for AVS/SEM) and subsampled as follows (Figure 2C):

- The top three intervals will be composited at the 0-1 ft, 1-2 ft, and 2-3 ft intervals with each interval subsampled:
  - Pore Water (via field draining prior to homogenization): ≥250-mL for PAHs and DOC.
  - Sediment: One 4-oz glass jar for PAHs
  - One 4-oz glass jar for TOC
  - One 4-oz glass jar for lead (rush turnaround) and microscopy
  - Note: From the sediment core with the greatest percent recovery, one 4-oz glass jar with a septum-cap, minimizing headspace for AVS/SEM
  - Two 1-gal ziploc bags for potential toxicity testing.
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
- The bottom intervals will be composited and subsampled:
  - Sediment: One 4-oz glass jar for PAHs

  - One 4-oz glass jar for TOC
  - One 4-oz glass jar for lead (rush turnaround) and microscopy
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
  - No subsampling for pore water or toxicity testing will occur at this depth, and any deeper recovered sediment will be logged to the bottom of the core, but not subsampled for analysis.
- Pore water, sediment for PAH, lead, TOC, microscopy, AVS/SEM, grain size, moisture content/ percent solids, and specific gravity samples will be shipped to Pace Analytical. All 2-gal toxicity samples will be shipped to Pacific Eco-Risk. Field teams will indicate on the COC forms to hold AVS/SEM, microscopy, grain size, toxicity, and geotechnical samples pending authorization.

2.1.7 PAH and Lead Combined Stations Sampling Option 3

PAH cores with coarse substrate that when inspected, appear "dry" and with little or no potential to generate the nominal 250-mL pore water volume necessary to extract for PAHs and analyze for DOC will be processed in a manner similar as discussed in section 2.1.3 and as summarized in Figure 2C. Depth intervals where there should be a pore water phase, e.g., the surface 0 - 1-ft interval, will be sampled according to Option 1. The following depth intervals will be composited (except for AVS/SEM) and subsampled as follows (Figure 2C):

- The top three intervals will be composited at the 0-1 ft, 1-2 ft, and 2-3 ft intervals with each interval subsampled:
  - Sediment: One 4-oz glass jar for PAHs
  - One 4-oz glass jar for TOC.
  - One 4-oz glass jar for lead (rush turnaround), and microscopy.
  - Note: From the sediment core with the greatest percent recovery, one 4-oz glass jar with a septum-cap, minimizing headspace for AVS/SEM Two 1-gal ziploc bags for potential toxicity testing.
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
- The bottom intervals will be composited and subsampled:
  - Sediment: One 4-oz glass jar for PAHs
  - One 4-oz glass jar for TOC
  - One 4-oz glass jar for lead (rush turnaround)
  - One 1-gal ziploc bag (filled halfway, 500 g of sediment) for grain size, moisture content/percent solids and specific gravity.
  - No subsampling for toxicity testing will occur at this depth, and any deeper recovered sediment, e.g., from 10-ft Lexan liners, will be logged to the bottom of the core, but not subsampled for analysis.
- Sediment for PAH, lead, TOC, microscopy, AVS/SEM, grain size, moisture content/percent solids, and specific gravity samples will be shipped to Pace Analytical. All 2-gal toxicity samples will be shipped to Pacific Eco-Risk. Field teams will indicate on the COC forms to hold AVS/SEM, microscopy, grain size, toxicity, and geotechnical samples pending authorization.

2.1.8 Background Reference Stations

The investigation will also include sampling at five (of six) background reference stations, previously sampled by Anchor QEA. Background reference stations are shown on Figure 1. Sampling at the background reference locations will follow the same sediment sampling protocol as the ecological risk sampling locations for PAHs and lead. However, because the upstream reference stations are considered unaffected by the Site, sediment will be collected at a single surface interval, typically 0-1 ft, and a subsurface interval, typically 1-3 ft for the analyses of PAHs, TOC, grain size, toxicity testing and/or lead, AVS/SEM and microscopy. Pore water only need be collected from the subsurface depth interval for the analyses of PAHs and DOC, reducing the number of cores that may be needed to generate the nominal sample volumes. The number of cores to be collected will be decided in the field based on observation of lithology, where a continuous lithology supports collecting a 1-3-ft interval as the "subsurface" interval.

2.2 CORE AND SAMPLE HANDLING AND DOCUMENTATION

Sediment coring logs will be created for each station. Information on the log will include station identification, core date/time, sample identifications, sample collection time, visual classification of each major sediment horizon or strata, core recovery length, equipment used, attempt records, and other information as necessary. Copies of boring/sediment coring forms are included in Appendix B.

Collected cores and samples will be handled in a manner that minimizes disturbance and maintains the integrity of the samples. As noted above in Section 2.3, multiple cores will be collected from one station to allow compositing sediment within specified depth intervals in order to generate sufficient volume of sediment for testing. When subsampling to composite a depth interval from multiple cores, clean, dedicated tools (e.g., spoons, mixing blades, bowls) will be used to process each sub-sample; stainless steel tools may be re-used following decontamination while other materials will be considered disposable. In the event of Option 2 as described in Section 2.3.2, the drill used to drill hole samples will be decontaminated between drill holes and new Teflon tubing will be used for each interval. All samples will be properly labelled (including sample name, date and time of collection, project name, and preservation), recorded on the COC forms, and placed in a dedicated storage area following processing and maintained at a temperature of 4°C ± 2°C.

2.2.1 Sample Identification

Samples will be assigned a unique, alphanumeric sample identification number by the sampler. The sample identification format for sediment analytical analyses will consist of the station number followed by a dash (-) and the subsequent depth intervals in feet. Samples that are field duplicates for QC purposes will be identified in a manner that allows for "blind" submittal to the laboratory.

2.2.2 Sample Custody

A COC form will be prepared for all samples for each laboratory. The COC form will contain the following information: sample identification number, date/time of sample collection, type of sample, sample matrix, preservative (if applicable), the analyses requested, and the number and type of sample containers. The primary objective of COC procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from time of sampling through completion of all required analyses. The COC form will be initially signed by an individual who assisted

in the collection of the samples. A copy will be retained by this person while the remaining carbon copies of the form accompany the samples to the laboratory. Copies of COC forms are included in Appendix B.

2.2.3 Decontamination

Sampling equipment, including drill equipment, that comes in direct contact with sample material and will be reused for sample collection will be brushed clean of gross contamination, washed with non-phosphate detergent (Alconox or equivalent), and rinsed with potable water.

The sample preparation tools will be decontaminated prior to each use. Tools used to process samples for bulk sediment chemistry analyses (e.g., spoons, bowls, mixing blades) will be decontaminated by the following procedure: brushed clean of gross contamination, washed with non-phosphate detergent (Alconox or equivalent), rinsed with thoroughly with deionized water, and dried.

Contaminated protective clothing (e.g., coveralls and disposable gloves) will be kept in plastic garbage bags to be isolated for separate treatment (e.g., laundering) and/or disposal.

2.3 DEEP SONIC BORINGS TO EVALUATE LITHOLOGY AND BEDROCK ELEVATION (OBJECTIVE 6)

A sonic drill rig equipped with a 5-foot coring device will be used to advance the deeper borings to evaluate the lithology and interpretation of bedrock elevation at previously sampled stations ORW-SC-35 and ORW-SC-37. These are two of approximately six locations where bedrock was previously encountered at depths ranging from approximately 2 to 10 feet bss. Sonic borings will be advanced to depths of up to 5-feet into competent bedrock. Sediment recovered from each 5-ft sample interval will be visually characterized for color, texture, and moisture content. The presence of visible staining, sheens, OLM, TLM, NAPL-blebs, odors and PID response will be noted and recorded. Photos will be taken of each 5-foot extracted sediment core and intervals where potential MGP impact is observed. Cored bedrock will be grouted upon boring completion, if NAPL/OLM or TLM are observed in the core at or close to the bedrock. Opportunistic samples will be collected as composites of depth intervals over which OLM, TLM, or NAPL is observed. These samples will be analyzed for a comprehensive suite of petroleum hydrocarbons and PAHs.

Should bedrock be encountered at elevations more than 10 ft deeper than previously recorded, Haley & Aldrich will confer with Duke Energy regarding additional deep sonic borings to accurately delineate bedrock elevations within the affected river portion of the Site.

2.4 PERMITS FOR FIELD INVESTIGATION AND SAMPLING

Haley & Aldrich coordinated with ACOE to document that the existing authorization LRL-2017-960 (dated 14 December 2017, valid until 18 March 2022) under the provision of 33 CFR 330 A Nationwide Permit No. 5 Scientific Measurement Devices and No. 6 Survey Activities is valid for the activities covered by the Work Plan. On 7 May 2019, ACOE provided an email approving the effectiveness of LRL-2017-960 to this work which is included in Appendix B.

Haley & Aldrich submitted an email to the ACOE with a Notice to Navigation Interests concerning the East End Gas Works Site, as well as the West End, two-weeks prior to beginning work on water at the East End Gas Works Site.

Haley & Aldrich coordinated with the Ohio Department of Transportation District 8 (ODOT) to obtain an extension of the prior ODOT permit to perform work within their right of way (under the Brent Spence Bridge). The prior ODOT permit (08-676-17) expired on 22 January 2018. On 7 May 2019, ODOT provided an email approving the extension request through December 2019 for our proposed work (included in Appendix B). The permit and associated email extension approval must be posted at the work site.

3. Sediment and Pore Water Chemical Analysis, Toxicity Testing, and Geotechnical Measurements

The following sections describe the stepwise sequencing of the planned chemical analysis, geotechnical measurements, and toxicity testing, and specify the analysis and testing methods to be employed. Based on our evaluation of existing data, there are three categories of stations where additional analysis is warranted:

- **PAHs Only Station:** Station where PAH data in the upper 3 ft of sediment have ESBTUs greater than 1 but where lead data is less than background conditions (100 mg/kg).
- **Lead Only Station:** Station where lead data in the upper 3 ft of sediment exceed background conditions (100 mg/kg) but where ESBTUs are less than 1.
- **PAHs and Lead Station:** Station where PAH data in the upper 3 ft of sediment have ESBTUs greater than 1 and where lead data is either not available or exceed background conditions (100 mg/kg).

Figures 4A to 4D summarizes the Step 1 chemical analyses and outcomes triggering the authorization of the Step 2 testing and geotechnical measurements. The following sections summarize the chemical analyses, toxicity testing, and geotechnical measurements.

3.1 CHEMICAL ANALYSES

Chemical analyses will be performed by Pace Analytical Services, LLC of Indianapolis, IN and Alpha Analytical of Mansfield, MA (subcontractor of Pace Analytical). The analytical methods, sampling volume, preservation requirements and holding times for chemical analyses are detailed in Table 2. The laboratory will provide the necessary containers, labels, and COC forms. Laboratory method detection limits (MDL), reporting limits (RL), and Ohio VAP certification are detailed in Table 3.

3.1.1 PAHs Only Stations

The analysis flow for PAHs Only Stations (Figure 3A) is as follows:

Step 1: The first step is to analyze all pore water extracted by centrifugation in the analytical lab or by gravity draining in the field for PAHs and DOC after the combined pore water is filtered or particles are flushed from the bottom of separatory funnels. Similarly, all sediment samples from the field or from the remains of the laboratory centrifugation will also be analyzed for PAHs and TOC. The measured concentrations of PAHs (EPA PAH-34) and DOC in pore water will be used to compute TUs, for which TU greater than 1 predicts, per the USEPA's equilibrium partitioning sediment benchmarks guidance, potential toxicity to benthic invertebrates. Bulk sediment concentrations of PAHs and TOC will be used to compute ESBTUs for any depth intervals from which sufficient pore water (approximately 250 mL) could not be collected or extracted. In such cases, ESBTUs greater than 1 predict potential toxicity to benthic invertebrates.

Step 2: The second step is triggered by the Step 1 outcomes. If measured TUs (or modeled ESBTUs) predict toxicity at any of the three depth intervals within the upper 3 ft of sediment, toxicity testing will be authorized within the 8-week holding time on the depth interval within a specific sediment core with the greatest TU (or ESBTU) from that station. Toxicity testing will consist of 10-day static acute bioassays for survival and growth with two species of freshwater invertebrates. Step 2 will also authorize geotechnical testing for all depths within a sediment core for which potential toxicity is predicted.

Judgment will be applied by Haley & Aldrich in consultation with Duke and the Toxicity Laboratory to attempt a dose-response curve across a range of TU values greater than 1. Accordingly, where multiple stations generate TU within a narrow range of values, it may be adequate to select 1 station for testing within that narrow range (e.g., TUs between 1 and 5) and apply the results to the other samples. Any such rationale will be documented in a Work Plan addendum.

Refer to Figure 3A for a flowchart for PAH Stations.

3.1.2 Lead Only Stations

The analysis flow for Lead Only Stations (Figure 3B) is as follows:

Step 1: The first step is to analyze all sediment for lead, with rush turnaround time, in order to allow for AVS/SEM analysis within holding time if triggered by the lead results.

Step 2: The second step is triggered by the Step 1 outcomes. If lead is reported above the 100 mg/kg screening level in one or more samples at a station, the bioavailability of lead will be evaluated through analysis of AVS/SEM for the depth interval with the greatest lead concentration. In addition, TOC will be analyzed for that depth interval. The depth interval with the greatest lead concentration will be authorized for microscopic analysis to evaluate potential non-MGP sources of lead, especially evidence of paint chips, which is a suspected source of elevated lead concentrations.

Step 3: If AVS/SEM indicates bioavailable lead, then toxicity testing will be authorized within the 8-week holding time on the same depth interval with the greatest lead concentration from that station. Toxicity testing will consist of 10-day static acute bioassays for survival and growth with two species of freshwater invertebrates. All sediment depth intervals from a station for which toxicity testing is authorized will also be authorized determination of grain size, specific gravity, moisture content.

3.1.3 PAHs and Lead Stations

The analysis flow for PAH and Lead Stations (Figure 3C) branches into different flow paths for sediment and pore water, summarized is as follows:

SEDIMENT

Step 1: The first step is to analyze all sediment for lead, with rush turnaround time, in order to allow for AVS/SEM analysis within holding time if triggered by the lead results. Sediments will also be analyzed for PAHs and TOC.

Step 2: The second step is triggered if lead is reported above the 100 mg/kg screening level in one or more samples at a station. The bioavailability of lead will be evaluated through analysis of AVS/SEM for the depth interval with the greatest lead concentration. The depth interval with the greatest lead concentration will be authorized for microscopic analysis to evaluate potential non-MGP sources of lead, especially evidence of paint chips, which is a suspected source of elevated lead concentrations.

If AVS/SEM indicates bioavailable lead, then toxicity testing will be authorized within the 8-week holding time on the same depth interval within a specific sediment core with the greatest lead concentration from that station. Toxicity testing will consist of 10-day static acute bioassays for survival and growth with two species of freshwater invertebrates. All sediment depth intervals from a station for which toxicity testing is authorized will also be authorized determination of grain size, specific gravity, moisture content.

PORE WATER

Step 1: The first step is to analyze all pore water extracted by centrifugation in the analytical lab or by gravity draining in the field for PAHs, lead, and DOC after the combined pore water is filtered or particles are flushed from the bottom of separatory funnels. The measured concentrations of PAHs (EPA PAH-34) and DOC in pore water will be used to compute TUs, for which TU greater than 1 predicts potential toxicity to benthic invertebrates. Bulk sediment concentrations of PAHs and TOC will be used to compute ESBTU for any depth intervals from which sufficient pore water (approximately 250 mL) could not be collected or extracted. In such cases, ESBTU greater than 1 predicts potential toxicity to benthic invertebrates.

Step 2: The second step is triggered by the Step 1 outcomes. If measured TUs (or modeled ESBTUs) predict toxicity at any of the three depth intervals within the upper 3 ft of sediment, toxicity testing will be authorized within the 8-week holding time on the depth interval within a specific sediment core with the greatest TU (or ESBTU) from that station. Toxicity testing will consist of 10-day static acute bioassays for survival and growth with two species of freshwater invertebrates. Step 2 will also authorize geotechnical testing for all depths within a sediment core for which potential toxicity is predicted. NOTE: the depth interval triggering toxicity testing on the basis of PAHs may differ from the depth interval triggering toxicity testing on the basis of bioavailable lead in bulk sediment. Accordingly, two separate depths may undergo toxicity testing from a single PAH and lead station.

Judgment will be applied by Haley & Aldrich in consultation with Duke and the toxicity laboratory to attempt a dose-response curve across a range of TU values greater than 1. Accordingly, where multiple stations generate TU within a narrow range of values, it may be adequate to select 1 station for testing within that narrow range (e.g., TUs between 1 and 5) and apply the results to the other samples. Any such rationale will be documented in a Work Plan addendum.

3.1.4 Reference Background Stations

The analysis flow for Reference Background (PAH and Lead) Stations (Figure 3D) also branches into different flow paths for sediment and pore water, summarized is as follows:

SEDIMENT

Step 1: The first step is to analyze all sediment for lead, with rush turnaround time, in order to allow for AVS/SEM analysis within holding time if triggered by the lead results. Sediments will also be analyzed for PAHs and TOC.

Step 2: The second step is triggered if lead is reported above the 100 mg/kg screening level in one or more samples at a station. The bioavailability of lead will be evaluated through analysis of AVS/SEM for the depth interval with the greatest lead concentration. The depth interval with the greatest lead concentration will be authorized for microscopic analysis to evaluate potential non-MGP sources of lead, especially evidence of paint chips, which is a suspected source of elevated lead concentrations.

If AVS/SEM indicates bioavailable lead, then toxicity testing will be authorized within the 8-week holding time on the same depth interval within a specific sediment core with the greatest lead concentration from that station. Toxicity testing will consist of 10-day static acute bioassays for survival and growth with two species of freshwater invertebrates**.** All sediment depth intervals from a station for which toxicity testing is authorized will also be authorized determination of grain size, specific gravity, moisture content.

PORE WATER

Step 1: The first step is to analyze all pore water extracted by centrifugation in the analytical lab or by gravity draining in the field for PAHs, lead, and DOC after the combined pore water is filtered or particles are flushed from the bottom of separatory funnels. The measured concentrations of PAHs (EPA PAH-34) and DOC in pore water will be used to compute TUs, for which TU greater than 1 predicts potential toxicity to benthic invertebrates. Bulk sediment concentrations of PAHs and TOC will be used to compute ESBTU for any depth intervals from which sufficient pore water (approximately 250 mL) could not be collected or extracted. In such cases, ESBTU greater than 1 predicts potential toxicity to benthic invertebrates.

Step 2: The second step is to authorize toxicity testing within the 8-week holding time on the depth interval with the greatest TU (or ESBTU) from that station, even if all TUs are less than 1. Toxicity testing will consist of 10-day static acute bioassays for survival and growth with two species of freshwater invertebrates. Step 2 will also authorize geotechnical testing for all depths within a sediment core. NOTE: In contrast to PAH and lead stations, the toxicity testing depth interval will only be selected on the basis of PAHs in pore water.

3.2 SEDIMENT TOXICITY TESTING

If Step 2 is triggered by Step 1 outcomes as described above, toxicity testing will be conducted. In accordance with OEPA DERR Ecological Risk Assessment Guidance, sediment toxicity tests are to be conducted to evaluate potential toxicity to freshwater macroinvertebrates and/or fish and at a minimum must include the *Hyalella azteca* and the *Chironomus tentans* (presently *Chironomus dilutus*) ten-day bioassay. Pacific EcoRisk of Fairfield, CA will perform a 10-day static acute survival and growth sediment toxicity test for *H. Azteca* and *C. dilutus,* using the sediment from the 0 – 3 ft depth interval within the sediment core with the greatest TU (or ESBTU) from that station.

H. azteca, a common amphipod crustacean, and *C. dilutus,* the larvae of a non-biting midge, are routinely employed as test organisms to evaluate the toxicity of freshwater sediments. Both species are good surrogates for native sediment dwelling organisms due to relative sensitivity to contaminants associated with sediment, contact with sediment, ease of culture in the laboratory, tolerance to varying physicochemical characteristics of sediment, and short generation time.

Prior to test initiation test sediments will be sieved using a 2 mm mesh to remove large stones, sticks, roots, man-made material and any indigenous organisms. Ten organisms will be exposed to site and background reference sediment in each of eight replicate chambers, as well as laboratory control sediment, over the course of 10 days (the control sediment is free of contaminants and used to assess the acceptability of the test organisms). Parameters such as light, temperature, overlying water quality, and feeding will be constant across tests. Specific water quality parameters such as pH, hardness, conductivity, etc. will be documented at the beginning and end of the test. Temperature and dissolved oxygen of test chambers will be documented daily. At the end of 10 days, the surviving organisms will be counted and prepared for weight or length measurements. OEPA guidance indicates that greater than 20% reduction in survival or growth as compared to the reference group is considered to be indicative of a potentially significant risk.

Data will be interpreted using a standard toxicity software that evaluates the minimum detectable differences between the test organisms exposed to site sediments vs. the reference (control) organisms. In order to identify a threshold sediment concentration of PAHs that may be having an effect on benthic organisms, a statistically significant dose/response function needs to be identified from all of the combined data (the “dose” as a sediment concentration or toxic unit, the “response” as survival and/or growth). The minimum threshold for estimating a preliminary remediation goal (PRG) would be 80% of the survival and/or growth response of the organisms exposed to the upstream “background” sediments.

3.3 GEOTECHNICAL MEASUREMENTS

If Step 2 is triggered by Step 1 outcomes as described above, Alpha Analytical of Mansfield, MA will perform the following measurements on all intervals of the sediment core for which potential toxicity is predicted:

- Grain size distribution by EPA D6913
- Specific gravity by ASTM D854
- Moisture content by ASTM D2216

4. Quality Assurance and Data Validation

4.1 LABORATORY CERTIFICATION UNDER VAP

The OEPA VAP certifies laboratories, called VAP CLs, that analyze environmental samples in support of work under the VAP. Pace Analytical Services, LLC (Pace) of Indianapolis, IN is listed as a CL and Alpha Analytical of Mansfield, MA (subcontracted by Pace) is listed as a CL; see Table 3 for analyses that are VAP certified by the laboratories.

Some of the analyses (PAH-34, for example by 8270C-Sim) necessary for this work to clearly define and understand the potential ecological risks (as detailed in OEPA Guidance on Evaluating Sediment Contaminant Results) do not appear to be certified by any laboratory under the VAP.

4.2 FIELD QUALITY CONTROL MEASURES

Field Quality Assurance/Quality Control (QA/QC) samples will be collected and used to evaluate the variability resulting from sampling handling and the efficiency of field decontamination procedures. Field QA/QC samples only will be collected for additional sediment quality delineation samples. All field QC samples will be documented in a project logbook.

4.2.1 Field Duplicates

Field duplicates (i.e., homogenization duplicates) will be collected from the shallow sediment samples that will be prepared for physical/chemical characterization. The field duplicate will be generated by subsampling a homogenized sediment sample (to be analyzed, not an archival sample) and splitting it into two unique samples (the original sample and a duplicate). The samples will be processed in exactly the same way as the original sample and will be submitted to the laboratory as a blind sample. The field duplicate will be analyzed for the same analytes as the primary sediment sample. Duplicates will be collected and analyzed at a rate of 5 percent (i.e., one per twenty samples).

4.2.2 Equipment Rinse Blanks

Equipment rinse blank samples will be collected to evaluate the efficiency of field decontamination procedures. One rinsate blank will be collected for the delineation sample collection equipment used on the barge, and a separate rinse blank will be collected for the equipment used in the sample processing procedures (mixing bowls, spoons, etc.). The shallow sediment sampling is anticipated to be completed in 5 to 10 days, and no more than 2 sets of rinsate blanks will be collected. After sample collection and decontamination, the equipment blanks will consist of rinsing the sampling equipment (only surface that come in contact with sediment samples) device and homogenization equipment with distilled water and collecting the rinsates.

4.3 DATA VALIDATION

4.3.1 Analytical Data

Data validation will be performed following National Functional Guidelines (EPA, 2004). Data validation includes signed entries by the field and laboratory technicians on field data sheets and laboratory

datasheets, respectively; review for completeness and accuracy; review by the Data Manager for outliers and omissions; and the use of QC criteria to accept or reject specific data. All laboratory data for delineation and/or risk screening/assessment will undergo validation to determine compliance with QA/QC requirements.

Validation of the analytical data (PAH analysis only) will be performed by the Haley & Aldrich data validation staff, based on the evaluation criteria outlined in the "National Functional Guidelines for Inorganic Superfund Method Data Review" for PAHs. The validation will include a review of each validation criterion, as prescribed by the guidelines, and will be presented in a Data Usability Summary Report for each analytical data package. The data verification/validation procedure will identify data as being acceptable, of limited usability (qualified as estimated), or rejected. Data quality will be assessed by considering the following:

- Verification of Ohio VAP Certification documentation;
- Holding times, preservation, and storage;
- COC forms and sample receipt forms;
- Method blanks;
- Surrogate recoveries;
- Detection limits;
- Laboratory Control Samples;
- Matrix Spike/Matrix Spike Duplicate samples; and,
- All communications between the laboratory and the Project QA/QC Representative.

Corrective actions will be communicated to the laboratory and the Haley & Aldrich and Duke Project Managers. Data validation reports will be maintained by Haley & Aldrich in the project files.

4.3.2 Toxicity Testing Data

The QA objectives for the biological testing conducted for this investigation are detailed in the laboratory standard operating procedures (SOP). The objectives for accuracy and precision involve all aspects of the testing process including the following:

- Water and sediment sampling and handling;
- Source and condition of test organisms;
- Condition of equipment;
- Test conditions;
- Instrument calibration;
- Use of reference toxicants;
- Record keeping; and,
- Data evaluation.

A reference toxicant will be tested on each test organism during acute toxicity bioassays to establish the validity of the toxicity data. For those species with substantive reference toxicant data available, the median effective concentration (EC_{50}) and/or Lethal Concentration 50% (LC_{50}) should fall within two standard deviations of the laboratory mean. If it does not, this indication of greater than or less than normal sensitivity will be noted in the final report to be considered as part of the results interpretation.

Water quality measurements will be monitored to ensure that they fall within prescribed limits, and corrective actions, as noted in the specific EPA/ASTM protocols for those methods, will be taken if necessary. All limits established for this program meet or exceed those recommended by the U.S. EPA and the ASTM.

5. Project and Subcontractor Management

There are aspects of the field investigation that will be managed and contracted directly through Duke. Below is a list of subcontractors, the contracting company, and a description of their role on the project.

Team Member	Company	Contact	Role
Todd Bachand	Duke	513-800-3413 (cell) Todd.Bachand@duke-energy.com	Duke PM and Liaison with Vessel and Waste Contractors
Shawn Fiore	Haley & Aldrich	216-469-7465 (cell) SFiore@haleyaldrich.com	Ohio VAP CP and PG
Kristen Wright-Ng	Haley & Aldrich	703.336.6215 (work) KWright-Ng@haleyaldrich.com	Haley & Aldrich Project Manager
Helder Costa	Haley & Aldrich	857-488-5405 (cell) HCosta@HaleyAldrich.com	Sediment Investigations Lead
Doug Allen	Haley & Aldrich	603-566-2604 DAllen@HaleyAldrich.com	Sediment Investigations Lead
Darcy Metzler	Haley & Aldrich	305-790-6041 (cell) DMetzler@HaleyAldrich.com	Field Survey Lead
Ciroos Liaghat	Haley & Aldrich	408-202-5726 (cell) CLiaghat@haleyaldrich.com	Field Geology Lead
Titania Ng	Haley & Aldrich	TNg@haleyaldrich.com (917) 306.1867	Analytical, Geotech, and Toxicity Lab Coordination
Jay Peters	Haley & Aldrich	603.391.3312 JPeters@haleyaldrich.com	Toxicity Lab Coordination
Subcontractor	**Contracting Company**	**Contact**	**Role**
Cascade Drilling	Haley & Aldrich	Mike Bentley 740-373-3970 1010 Greene Street Marietta, OH 45750	Sonic drilling
Alpha Analytical	Pace Analytical	Kevin Herring Project Manager Pace Analytical Services 9800 Kincey Ave, Suite 100 Huntersville, NC 28078 O: 704-977-0945 | C: 704-930-8294	Geotech Lab
Pacific EcoRisk	Duke Energy	Jeff Cotsifas (707) 207-7761 cotsifas@pacificecorisk.com 2250 Cordelia Road Fairfield, CA 94534	Toxicology Lab
Pace Analytical	Duke Energy	Kevin Herring Project Manager Pace Analytical Services 9800 Kincey Ave, Suite 100 Huntersville, NC 28078 O: 704-977-0945 | C: 704-930-8294	Analytical Lab for Chemistry, subcontracting Alpha Analytical (Elizabeth Porta, Project Manager)
Subcontractor	**Contracting Company**	**Contact**	**Role**
EMS	Duke Energy	Tim Acri Senior Vice President direct: 513.567.6273 cell: 513.309.7461 tacri@EMSonsite.com	Support (see details below)
C&B Marine	EMS: Duke	n/a	Barge
Rumpke Landfill	Duke Energy	n/a	Waste Disposal Facility

Key assumptions relative to Duke direct-bill subcontractors are:

- Investigation-derived waste (IDW) will be placed in lined roll-offs or drums provided and stored by EMS. Haley & Aldrich will document and label the containers for future off-site disposal by Duke. Haley & Aldrich understands that Duke has previously profiled this waste and has an open profile to dispose of IDW at Rumpke Landfill. No additional waste characterization is planned.

- EMS will subcontract with C&B Marine to provide the tugboat and barge equipped with a bent crane, moon hole, roll-off, storage container, portable lavatories, and handwashing stations. EMS will furnish and operate a rescue boat, runner boat, and sheen control boat.

- EMS will provide spill response materials and will be on-hand during work in the river. We understand that EMS has coordinated with Duke to provide a skirted boom around the barge and sorbent materials for within the boomed area. EMS will coordinate containerization of any spill response materials and disposal as required.

- One Haley & Aldrich employee (Ciroos Liaghat) has a Transportation Worker Identification Credentials (TWIC). We understand that a TWIC holder can escort visitors at a frequency of one authorized TWIC holder to five (5) non-TWIC visitors. We understand that the EMS crew members are TWIC holders and will assist Dr. Liaghat with escorting non-TWIC holder Haley & Aldrich employees at the permissible frequency.

References

1. Anchor QEA West End Manufactured Gas Plant Site – Ohio River, Ohio Voluntary Action Program, Ohio River Phase II Property Assessment Work Plan dated December 2017.

2. Arcadis West End Site Sediment Investigation Report dated May 2014.

3. OEPA. 2018. Division of Environmental Response and Revitalization Assessment, Remediation and Corrective Action Section. Ecological Risk Assessment Guidance Document. July.

4. OEPA. Guidance on Evaluating Sediment Contaminant Results. Division of Surface Water, Standards and Technical Support Section. January 2010.

5. United States Environmental Protection Agency. 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. EPA-600-R-02-013. U.S. Environmental Protection Agency, Office of Research and Development. November.

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TABLES

TABLE 1
SAMPLING RATIONALE TO ADDRESS PREDICTED PRELIMINARY ECOLOGICAL RISK IN SEDIMENT
WEST END FORMER MANUFACTURED GAS PLANT
CINCINNATI, OHIO

														Pore Water Extraction/Analysis*			Bulk Sediment Testing/Analysis*								
Original Location	Sample Depth ft bss	Northing NAD 1983 Ohio South	Easting NAD 1983 Ohio South	Mudline Elevation (ft MSL)	tPAH SW8270 mg/kg	tPAH SW8270 C-SIM mg/kg	tPAH SW8270 D-SIM mg/kg	TOC %	Pb mg/kg	ESBTU (SW8270)	ESBTU (SIM)	Profile Top 3-ft	New Station ID	Centrifugation	PAH (EPA-34) 8270D-SIM(M)	DOC SW5310C	PAH (EPA-34) 8270D-SIM(M)	TOC SW9060A	Pb EPA 6010B	AVS/SEM EPA-821-R-100	Grain Size ASTM D6913	Toxicity ASTM E1706	Specific Gravity ASTM D854	Moisture Content ASTM D2216	Microscopy
CB-08	8-9.9	404344.4	1394303.9	436.38	4276.2	26650	-	6.1	-	-	900	SAMPLE - PAH & Pb Protocol to fill spatial gap and because no shallow data is available no Pb data available	PDI-CB-08	3	3	3	4	4	4	1	4	1	4	4	1
CB-09	0.3-2.2	404328.7	1394402.5	434.08	-	37990	-	1.1	-	-	6090	SAMPLE - PAH & Pb Protocol no Pb data available	PDI-CB-09	3	3	3	4	4	4	1	4	1	4	4	1
CB-10	0.5-5	404338.5654	1394500.586	435.658	-	841.7	-	4.5	-	-	37.1	SAMPLE - PAH & Pb Protocol no Pb data available confirm access under bridge	PDI-CB-10	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SG-24	0-0.5	404497.917	1393685.672	-	-	-	7.96	1.09	114	0	1.3	SAMPLE - PAH & Pb Protocol *Go to SG-24 location	PDI-SG-24	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-24	0.5-1	404484.878	1393664.842	446.95	5.75	-	4.28	0.741	22.7	1	1.1														
ORW-SC-25	0-0.5	404491.947	1393774.822	-	3.66	-	17.51	2.47	65.9	0.18	1.3	SAMPLE - PAH Protocol *Go to SC-25 location	PDI-SC-25	3	3	3	4	4	0	0	4	1	4	4	0
ORW-SC-25	0.5-1	404458.949	1393757.239	440.36	52.14	-	100.07	3.26	50.5	2	5.8														
ORW-SG-26	0-0.5	404458.917	1393878.213	-	135.83	-	2.62	4.01	10.6	4.6	0.1	SAMPLE - PAH Protocol	PDI-SG-26	3	3	3	4	4	0	0	4	1	4	4	0
ORW-SG-26A	0-0.5	404458.917	1393878.213	-	5.72	-	27.22	3.14	94.60	0.22	1.5														
ORW-SG-31	0-0.5	404393.415	1394369.014	-	1.30	-	0.05	2.12	147	0.1	0	SAMPLE - Pb Protocol	PDI-SG-31	0	0	0	0	4	4	1	4	1	4	4	1
ORW-SG-32	0-0.5	404394.826	1394465.37	-	0.63	-	0.49	2.52	184	0	0	SAMPLE - Pb Protocol	PDI-SG-32	0	0	0	0	4	4	1	4	1	4	4	1
ORW-SG-34	0-0.5	404380.247	1394729.149	-	1.69	-	2.82	3.73	138	0	0	SAMPLE - Pb Protocol	PDI-SG-34	0	0	0	0	4	4	1	4	1	4	4	1
ORW-SG-57A	0-0.5	404250.222	1394327.735	-	1.24	-	0.03	1.05	118	0.1	0	SAMPLE - Pb Protocol	PDI-SG-57A	0	0	0	0	4	4	1	4	1	4	4	1
ORW-SC-08	0-0.5	404494.437	1393790.073	-	40.78	-	4.89	2.85	193	1.9	0.3	SAMPLE - PAH & Pb Protocol Riverbank - check if sed habitat before sampling	PDI-SC-08	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-09	0-0.5	404469.779	1393868.45	-	63.62	-	58.58	8.22	123	0.96	1.3	SAMPLE - PAH & Pb Protocol Riverbank - check if sed habitat before sampling	PDI-SC-09	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-10	0-0.5	404462.299	1393964.943	-	118.79	-	525.96	4.21	171	3.5	22	SAMPLE - PAH & Pb Protocol Riverbank - check if sed habitat before sampling	PDI-SC-10	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-26	0.5-1	404422.479	1393872.085	440.93	172.86	-	123.54	8.57	-	2.7	2.6	SAMPLE - PAH & Pb Protocol no Pb data available	PDI-SC-26	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-27	0.5-1	404411.187	1393944.017	442.74	539.08	-	633.81	13.4	105	5.6	8.8	SAMPLE - PAH & Pb Protocol	PDI-SC-27	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-28	no shallow data	404396.839	1394066.447	-	no shallow data	no shallow data	no shallow data	no shallow data	no shallow data	no shallow data	no shallow data	SAMPLE - PAH & Pb Protocol to fill spatial gap and because no shallow data is available	PDI-SC-28	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-29	no shallow data	404377.89	1394157.09	-	no shallow data	no shallow data	no shallow data	no shallow data	no shallow data	no shallow data	no shallow data	SAMPLE - PAH & Pb Protocol to fill spatial gap and because no shallow data is available	PDI-SC-29	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-30	0.5-1	404365.394	1394267.167	440.86	25.70	-	28.03	2.42	72.4	1.4	2.8	SAMPLE - PAH Protocol	PDI-SC-30	3	3	3	4	4	0	0	4	1	4	4	0
ORW-SC-31	0-0.8	404352.941	1394364.165	440.46	53.74	-	139.53	7.02	7310	1	4	SAMPLE - PAH & Pb Protocol	PDI-SC-31	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-31	0.5-1	404352.941	1394364.165	440.46	5.59	-	11.91	2.34	165	0.3	1														
ORW-SC-32	0.5-1	404362.844	1394450.896	441.66	720.00	-	717.82	5.4	56.6	19.4	27	SAMPLE - PAH Protocol	PDI-SC-32	3	3	3	4	4	0	0	4	1	4	4	0
ORW-SC-33	0.5-1	404367.203	1394566.841	443.64	122.79	-	48.25	3.08	280	5.5	3.4	SAMPLE - PAH & Pb Protocol	PDI-SC-33	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-34	0.5-1	404332.732	1394697.461	444.76	12.03	-	11.45	3.17	227	0.5	0.7	SAMPLE - Pb Protocol *push out east to the buffer	PDI-SC-34	0	0	0	0	4	4	1	4	1	4	4	1
ORW-SC-42R	0.5-1	404355.097	1393810.904	423.51	9.76	-	13.51	2.3	-	0.6	1.6	SAMPLE - PAH Protocol	PDI-SC-42R	3	3	3	4	4	0	0	4	1	4	4	0
ORW-SC-42R	2-3.7	404355.097	1393810.904	423.51	478.24	-	237.72	5.93	3.88	11.5	15														
ORW-SC-43	0.5-1	404352.94	1393915.621	430.9	163.04	-	88.15	1.84	251	14.3	9.6	SAMPLE - PAH & Pb Protocol	PDI-SC-43	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-43	1-2	404352.94	1393915.621	430.9	39.91	-	34.14	4.43	55.5	1.2	1.4			3	3	3	4	4	4	1	4	1	4	4	1
ORW-SG-45	0-0.5	404327.34	1394115.039	-	0.58	-	1.03	1.09	1170	0	0	SAMPLE - PAH & Pb Protocol	PDI-SG/SC-45	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-45	0.5-1	404322.113	1394109.594	427.74	33.16	-	11.24	2.05	58	2	1			3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-46	0.5-1	404293.191	1394198.935	431.01	8.59	-	9.82	0.743	255	1.5	2.5	SAMPLE - PAH & Pb Protocol	PDI-SC-46	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-48	0.5-1.5	404301.286	1394427.351	434.42	595.29	-	394.25	2.73	-	31.1	25.8	SAMPLE - PAH & Pb Protocol no Pb data available	PDI-SC-48	3	3	3	4	4	4	1	4	1	4	4	1
ORW-SC-49	0.5-1	404282.245	1394569.336	434.3	12.01	-	15.33	2.69	143	0.6	1.1	SAMPLE - PAH & Pb Protocol	PDI-SC-49	3	3	3	4	4	4	1	4	1	4	4	1
Background Stations													PDI-BGW-01	3	3	3	4	4	4	1	4	1	4	4	1
													PDI-BGW-02	3	3	3	4	4	4	1	4	1	4	4	1
													PDI-BGW-03	3	3	3	4	4	4	1	4	1	4	4	1
													PDI-BGW-04	3	3	3	4	4	4	1	4	1	4	4	1
													PDI-BGW-05	3	3	3	4	4	4	1	4	1	4	4	1
													PDI-BGW-06	3	3	3	4	4	4	1	4	1	4	4	1
Deep Sonic Boring Stations to confirm Bedrock, opportunistic samples may be collected but are not included in this analysis count.													PDI-SB-35	-	-	-	-	-	-	-	-	-	-	-	-
													PDI-SB-37	-	-	-	-	-	-	-	-	-	-	-	-
													TOTALS	**93**	**93**	**93**	**124**	**144**	**124**	**31**	**144**	**36**	**144**	**144**	**31**
ORW-SG-41A	0-0.5	404393.415	1393717.722	423.37	3.31	-	0.64	ND (0.1)	-	4.1	1.2	NO SAMPLE tPAH<10 :. Not Attributed to MGP	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ORW-SG-42A	0-0.5	404375.939	1393760.54	423.51	1.01	-	0.11	0.053	-	1.9	0.4	NO SAMPLE tPAH<10 :. Not Attributed to MGP	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ORW-SG-43	0-0.5	404362.511	1393903.078	-	-	-	5.20	ND (0.1)	48.4	-	9.4	NO SAMPLE Low tPAHs and extremely low TOC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ORW-SG-44	0-0.5	404336.499	1394005.491	-	1.95	-	0.73	0.0722	-	3.1	1.7	NO SAMPLE Low tPAHs and extremely low TOC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

* assumes the maximum number of samples to be authorized, does not account for step-out locations. This analysis count is provide potential numbers for the lab. The field team should follow the field sampling protocols in Figures 2A-2C

TABLE 2
SEDIMENT CONTAINER AND HOLDING TIMES FOR CHEMICAL ANALYSES
WEST END GAS WORKS
CINCINNATI, OHIO

Media	Analytical Parameter	Lab	Method	Containers	Sample Volume/Weight	Preservation	Holding Time
Sediment	EPA PAH-34 (with alkylated PAHs)	Alpha Analytical, Mansfield, MA	EPA 8270-C SIM Modified	(1) 4-oz glass, teflon-lined	4 oz	Cool to 4° C	14 days (extraction)
	TOC	Pace Analytical, Asheville, NC	9060A	(1) 4-oz glass, teflon-lined	4 oz		28 days
	Lead	Pace Analytical, Indianapolis, IN	6010B	(1) 4-oz glass, teflon-lined	4 oz		180 days
	Electron microscopy (lead)	McCrone Associates Westmont, IL	Not applicable			None	Not applicable
	AVS/SEM	Pace Analytical, Green Bay, WI	EPA-821-R-100	(1) 4-oz glass, teflon-lined, (no headspace)	4 oz	Cool to 4° C	14 days
	Grain Size	Alpha Analytical, Mansfield, MA	EPA D6913	(1) Double bagged 1-gal ziploc (filled halfway)	500 g	None	Not applicable
	Moisture Content	Alpha Analytical, Mansfield, MA	ASTM D2216				Not applicable
	Specific Gravity	Alpha Analytical, Mansfield, MA	ASTM D854				Not applicable
	Toxicity	Pacific Eco-Risk, Fairfield, CA	ASTM E1706	(2) Double bagged 1-gal ziploc	5 liters	Cool to 4° C	8 weeks
Pore Water (Sediment Centrifugation)	EPA PAH-34 (with alkylated PAHs)	Alpha Analytical, Mansfield, MA	EPA 8270-C SIM Modified	Field Option 1: (1) Double-bagged 1-gal ziploc	4 liters	Cool to 4° C	14 days (centrifugation)
Pore water	EPA PAH-34 (with alkylated PAHs)	Alpha Analytical, Mansfield, MA	EPA 8270-C SIM Modified	Field Option 2: (1) 100-mL amber glass (for field collection of pore water by draining Option 2) per core interval	≥250 mL	Cool to 4° C	7 Days (extraction)
	DOC	Alpha Analytical, Mansfield, MA	9060A	Aliquoted in lab from PAH pore water sample	40 mL	Cool to 4° C	28 days (Lab to filter)

°C: degrees Celsius
AVS/SEM: Acid Volatile Sulfide/Simultaneously Extracted Metals
DOC: Dissolved Organic Carbon
PAHs: Polycyclic aromatic hydrocarbons
TOC: Total Organic Carbon

TABLE 3
LABORATORY METHOD DETECTION LIMITS (MDLS), REPORTING LIMITS (RLS), AND OHIO VAP CERTIFICATION
WEST END GAS WORKS
CINCINNATI, OHIO

Media	Chemical Group	Lab	Target Analyte	CAS Number	Method	Reporting Limits (mg/kg)	Method Detection Limits (mg/kg)	Ohio VAP-Certified?
Sediment	PAHs	Alpha Analytical, Mansfield, MA	2-Methylnaphthalene	91-57-6	8270D-SIM(M)	0.001005	0.000259156	NA
			Acenaphthene	83-32-9	8270D-SIM(M)	0.001005	0.000177148	Yes
			Acenaphthylene	208-96-8	8270D-SIM(M)	0.001005	0.000191754	NA
			Anthracene	120-12-7	8270D-SIM(M)	0.001005	0.000207164	Yes
			Benz(a)anthracene	56-55-3	8270D-SIM(M)	0.001005	0.000204886	Yes
			Benzo(a)pyrene	50-32-8	8270D-SIM(M)	0.001005	0.000286894	Yes
			Benzo(b)fluoranthene	205-99-2	8270D-SIM(M)	0.001005	0.000261367	Yes
			Benzo(ghi)perylene	191-24-2	8270D-SIM(M)	0.001005	0.000266995	Yes
			Chrysene	218-01-9	8270D-SIM(M)	0.001005	0.000203144	Yes
			Fluoranthene	206-44-0	8270D-SIM(M)	0.001005	0.000319322	Yes
			Fluorene	86-73-7	8270D-SIM(M)	0.001005	0.000268067	Yes
			Indeno(1,2,3-cd)Pyrene	193-39-5	8270D-SIM(M)	0.001005	0.000272757	Yes
			Naphthalene	91-20-3	8270D-SIM(M)	0.001005	0.000288837	Yes
			Phenanthrene	85-01-8	8270D-SIM(M)	0.001005	0.00033299	NA
			Pyrene	129-00-0	8270D-SIM(M)	0.001005	0.000264315	Yes
			1-Methylnaphthalene	90-12-0	8270D-SIM(M)	0.001005	0.000316642	NA
			Benzo(e)Pyrene	192-97-2	8270D-SIM(M)	0.001005	0.000207365	NA
			Benzo(j)+(k)Fluoranthene	205-82-3/207-08-9	8270D-SIM(M)	0.001005	0.000199459	Yes
			C1-Chrysenes	218-01-9C1	8270D-SIM(M)	0.001005	0.000203144	NA
			C1-Fluoranthenes/Pyrenes	FLUORPYRC1	8270D-SIM(M)	0.001005	0.000264315	NA
			C1-Fluorenes	86-73-7C1	8270D-SIM(M)	0.001005	0.000268067	NA
			C1-Naphthalenes	91-20-3C1	8270D-SIM(M)	0.001005	0.000288837	NA
			C1-Phenanthrenes/Anthracenes	PHENANTHC1	8270D-SIM(M)	0.001005	0.00033299	NA
			C2-Chrysenes	218-01-9C2	8270D-SIM(M)	0.001005	0.000203144	NA
			C2-Fluorenes	86-73-7C2	8270D-SIM(M)	0.001005	0.000268067	NA
			C2-Naphthalenes	91-20-3C2	8270D-SIM(M)	0.001005	0.000288837	NA
			C2-Phenanthrenes/Anthracenes	PHENANTHC2	8270D-SIM(M)	0.001005	0.00033299	NA
			C3-Chrysenes	218-01-9C3	8270D-SIM(M)	0.001005	0.000203144	NA
			C3-Fluorenes	86-73-7C3	8270D-SIM(M)	0.001005	0.000268067	NA
			C3-Naphthalenes	91-20-3C3	8270D-SIM(M)	0.001005	0.000288837	NA
			C3-Phenanthrenes/Anthracenes	PHENANTHC3	8270D-SIM(M)	0.001005	0.00033299	NA
			C4-Chrysenes	218-01-9C4	8270D-SIM(M)	0.001005	0.000203144	NA
			C4-Naphthalenes	91-20-3C4	8270D-SIM(M)	0.001005	0.000288837	NA
			C4-Phenanthrenes/Anthracenes	PHENANTHC4	8270D-SIM(M)	0.001005	0.00033299	NA
			Dibenz(a,h)+(a,c)anthracene	215-58-7/53-70-3	8270D-SIM(M)	0.001005	0.000271484	Yes
			Perylene	198-55-0	8270D-SIM(M)	0.001005	0.000193965	NA
	Metals	Pace Analytical, Indianapolis, IN	Lead	7439-92-1	6010B	1	0.5	Yes
		Pace Analytical, Green Bay, WI	AVS-SEM Lead	7439-92-1	EPA-821-R-100	0.001755 umoles/g	0.000526 umoles/g	NA
	TOC	Pace Analytical, Asheville, NC	Total Organic Carbon	NONE	9060A	600	429	NA

TABLE 3
LABORATORY METHOD DETECTION LIMITS (MDLS), REPORTING LIMITS (RLS), AND OHIO VAP CERTIFICATION
WEST END GAS WORKS
CINCINNATI, OHIO

Media	Chemical Group	Lab	Target Analyte	CAS Number	Method	Reporting Limits (ug/L)	Method Detection Limits (ug/L)	Ohio VAP-Certified?
Pore water	PAHs	Alpha Analytical, Mansfield, MA	2-Methylnaphthalene	91-57-6	8270D-SIM(M)	0.01	0.0023	NA
			Acenaphthene	83-32-9	8270D-SIM(M)	0.01	0.00128	Yes
			Acenaphthylene	208-96-8	8270D-SIM(M)	0.01	0.002	NA
			Anthracene	120-12-7	8270D-SIM(M)	0.01	0.00181	Yes
			Benz(a)anthracene	56-55-3	8270D-SIM(M)	0.01	0.00116	Yes
			Benzo(a)pyrene	50-32-8	8270D-SIM(M)	0.01	0.00215	Yes
			Benzo(b)fluoranthene	205-99-2	8270D-SIM(M)	0.01	0.00147	Yes
			Benzo(ghi)perylene	191-24-2	8270D-SIM(M)	0.01	0.00265	Yes
			Benzo(j)+(k)Fluoranthene	205-82-3/207-08-9	8270D-SIM(M)	0.01	0.00149	Yes
			Chrysene	218-01-9	8270D-SIM(M)	0.01	0.00126	Yes
			Dibenz(a,h)+(a,c)anthracene	215-58-7/53-70-3	8270D-SIM(M)	0.01	0.00294	Yes
			Fluoranthene	206-44-0	8270D-SIM(M)	0.01	0.00178	Yes
			Fluorene	86-73-7	8270D-SIM(M)	0.01	0.00177	Yes
			Indeno(1,2,3-cd)Pyrene	193-39-5	8270D-SIM(M)	0.01	0.00246	Yes
			Naphthalene	91-20-3	8270D-SIM(M)	0.01	0.00197	Yes
			Phenanthrene	85-01-8	8270D-SIM(M)	0.01	0.0012	NA
			Pyrene	129-00-0	8270D-SIM(M)	0.01	0.00182	Yes
			1-Methylnaphthalene	90-12-0	8270D-SIM(M)	0.01	0.00195	NA
			Benzo(e)Pyrene	192-97-2	8270D-SIM(M)	0.01	0.00131	NA
			C1-Chrysenes	218-01-9C1	8270D-SIM(M)	0.01	0.00126	NA
			C1-Fluoranthenes/Pyrenes	FLUORPYRC1	8270D-SIM(M)	0.01	0.00182	NA
			C1-Fluorenes	86-73-7C1	8270D-SIM(M)	0.01	0.00177	NA
			C1-Naphthalenes	91-20-3C1	8270D-SIM(M)	0.01	0.00197	NA
			C1-Phenanthrenes/Anthracenes	PHENANTHC1	8270D-SIM(M)	0.01	0.0012	NA
			C2-Chrysenes	218-01-9C2	8270D-SIM(M)	0.01	0.00126	NA
			C2-Fluorenes	86-73-7C2	8270D-SIM(M)	0.01	0.00177	NA
			C2-Naphthalenes	91-20-3C2	8270D-SIM(M)	0.01	0.00197	NA
			C2-Phenanthrenes/Anthracenes	PHENANTHC2	8270D-SIM(M)	0.01	0.0012	NA
			C3-Chrysenes	218-01-9C3	8270D-SIM(M)	0.01	0.00126	NA
			C3-Fluorenes	86-73-7C3	8270D-SIM(M)	0.01	0.00177	NA
			C3-Naphthalenes	91-20-3C3	8270D-SIM(M)	0.01	0.00197	NA
			C3-Phenanthrenes/Anthracenes	PHENANTHC3	8270D-SIM(M)	0.01	0.0012	NA
			C4-Chrysenes	218-01-9C4	8270D-SIM(M)	0.01	0.00126	NA
			C4-Naphthalenes	91-20-3C4	8270D-SIM(M)	0.01	0.00197	NA
			C4-Phenanthrenes/Anthracenes	PHENANTHC4	8270D-SIM(M)	0.01	0.0012	NA
			Perylene	198-55-0	8270D-SIM(M)	0.01	0.00183	NA
	Metals	Pace Analytical, Indianapolis, IN	Lead	7439-92-1	6010B	10	4.470	Yes
	DOC	Alpha Analytical, Mansfield, MA	Dissolved Organic Carbon	NONE	9060A	1000	43	NA

DOC: Dissolved Organic Carbon
PAHs: Polycyclic aromatic hydrocarbons
TOC: Total Organic Carbon

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in

Case No(s). 20-0053-GA-RDR, 20-0054-GA-ATA

Summary: Testimony Shawn Fiore SSF-2 Attachment Part 5-1 electronically filed by Mrs. Debbie L Gates on behalf of Duke Energy Ohio Inc. and D'Ascenzo, Rocco O. Mr. and Kingery, Jeanne W and Vaysman, Larisa