Appendix B; Table B-1 -Exposure Unit 1

Corrective Measures Proposal
Union Carbide Corporation Institute Facility,
Institute, West Virginia

Analyte Name
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,1-Dichloropropene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (EDB)
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,3-Dichloropropane
1,4-Dichlorobenzene
1,4-Dioxane (p-Dioxane)
2,2-dichloropropane
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dichlorophenoxyacetic acid
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Butanone
2-Chloroethyl vinyl ether

Result Units	No. of Samples	No. of Locations	Detect Sample Count	Detect Location Count	Frequency of Detection	Minimum Non-Detect Result	Maximum Non-Detect Result
µg/L	2	2				5	5
µg/L	21	10				1	5
µg/L	21	10				1	5
µg/L	21	10				1	5
µg/L	21	10	5	2	24%	1	5
µg/L	21	10	3	1	14%	1	5
µg/L	2	2				5	5
µg/L	2	2				5	5
µg/L	2	2				5	5
µg/L	21	10				1	5.2
µg/L	2	2				5	5
µg/L	2	2				5	5
µg/L	2	2				5	5
µg/L	21	10	6	3	29%	1	5.2
µg/L	21	10				1	5
µg/L	21	10				1	5
µg/L	2	2				5	5
µg/L	21	10				1	5
µg/L	2	2				5	5
µg/L	21	10				1	5.2
µg/L	36	11	31	10	86%	1	500
µg/L	2	2				5	5
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	4	4	4	4	100%		
µg/L	16	9				0.5	5.2
µg/L	16	9				2	26
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	21	10				10	100
µg/L	2	2				10	10

Minimum Detect Result	Maximum Detect Result	Average Detected Result	Location (Date) of Max. Detect	Tap Water RSL	No. of Exceedances	Ratio of Max. Exceedance / RSL
3.65	15	7.042	VW-19A (8/31/2000)	2.8	5	5.4
4.48	14	8.72	VW-19A (8/31/2000)	280	0	
1.65	8.41	4.82	W-13 (11/17/2011)	300	0	
1.3	88.04	23.48225806	W-13 (10/19/2010)	0.46	20	191.4
10	10	10	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	170	0	

MCL	No. of Exceedances	Ratio of Max. Exceedance / MCL	VISL	No. of Exceedances	Ratio of Max. Exceedance / VISL
	0		430	0	
7	2	2.0	1000	0	
600	0		17000	0	
	0		180000	0	
70	0			0	

2-Chloronaphthalene
2-Chlorophenol
2-Chlorotoluene
2-Hexanone
2-Methylnaphthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3,3'-Dichlorobenzidine
3-Methylphenol
3-Methylphenol & 4-Methylphenol
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl ether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether
4-Chlorotoluene
4-Methyl-2-pentanone
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Acetone
Acrylonitrile
Anthracene
Antimony
Antimony, dissolved
Aroclor-1016
Aroclor-1221
Aroclor-1232
Aroclor-1242
Aroclor-1248
Aroclor-1254

µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	2	2				5	5
µg/L	21	10				5	25
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				2	26
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	10
µg/L	2	2				5	5.4
µg/L	14	8				0.5	0.617
µg/L	16	9				2	26
µg/L	16	9				2	26
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	2	2				5	5
µg/L	21	10				5	25
µg/L	16	9				2	26
µg/L	16	9				2	26
µg/L	16	9	1	1	6%	0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	21	10				25	125
µg/L	19	10				10	50
µg/L	16	9				0.5	5.2
mg/L	5	4	4	4	80%	0.001	0.001
mg/L	14	8				0.001	0.001
µg/L	4	4	4	4	100%		
µg/L	4	4	4	4	100%		
µg/L	4	4	4	4	100%		
µg/L	4	4	4	4	100%		
µg/L	4	4	4	4	100%		
µg/L	4	4	4	4	100%		

0.585	0.585	0.585	VW-19A (11/14/2011)	530	0	
0.01	0.01	0.01	W-2 (7/19/2010), W-1 (7/23/2010), W-13 (7/21/2010), W-8A (7/21/2010)	0.0078	0	
0.2	0.2	0.2	W-2 (7/19/2010), W-1 (7/23/2010), W-13 (7/21/2010), W-8A (7/21/2010)	0.22	0	
0.2	0.2	0.2	W-2 (7/19/2010), W-1 (7/23/2010), W-13 (7/21/2010), W-8A (7/21/2010)	0.0047	0	
0.2	0.2	0.2	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	0.0047	0	
0.2	0.2	0.2	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	0.0078	0	
0.2	0.2	0.2	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	0.0078	0	
0.2	0.2	0.2	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	0.0078	0	

	0			0	
0.006	0			0	
	0			0	
	0		23	0	
	0		7.2	0	
	0		15	0	
	0		12	0	
	0		19	0	

Aroclor-1260
Arsenic
Arsenic, dissolved
Barium
Barium, dissolved
Benzene
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (g,h,i) perylene
Benzo(k)fluoranthene
Benzoic Acid
Benzyl alcohol
Beryllium
Beryllium, dissolved
Bis (2-chloroethoxy) methane
Bis (2-chloroethyl) ether
Bis (2-chloroisopropyl) ether
Bis (2-ethylhexyl) phthalate
Bromodichloromethane
Bromoform
Bromomethane
Butyl benzylphthalate
Cadmium
Cadmium, dissolved
Carbazole
Carbon disulfide
Carbon tetrachloride
Chloride
Chlorobenzene
Chlorobromomethane
Chloroethane
Chloroform
Chloromethane
Chromium
Chromium, dissolved
Chrysene
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene

µg/L	4	4	4	4	100%		
mg/L	7	6	7	6	100%		
mg/L	16	8	15	7	94%	0.001	0.001
mg/L	15	6	15	6	100%		
mg/L	16	8	16	8	100%		
µg/L	39	12	22	7	56%	1	5
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	2	2				25	26
µg/L	2	2				5	5.2
mg/L	5	4	4	4	80%	0.002	0.002
mg/L	22	8	2	1	9%	0.002	0.01
µg/L	16	9				0.5	5.2
µg/L	35	11	26	8	74%	0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9	2	2	13%	5	6.17
µg/L	21	10				1	5
µg/L	21	10				1	5
µg/L	21	10				1	10
µg/L	16	9	1	1	6%	0.5	5.2
mg/L	15	6	13	4	87%	0.01	0.01
mg/L	22	8	7	3	32%	0.0005	0.0025
µg/L	14	8				0.5	0.617
µg/L	21	10				1	5
µg/L	21	10				1	5
mg/L	2	2	2	2	100%		
µg/L	33	12	20	6	61%	1	5
µg/L	2	2				5	5
µg/L	21	10	2	1	10%	1	10
µg/L	21	10				1	5
µg/L	21	10				1	10
mg/L	7	6	5	5	71%	0.005	0.02
mg/L	16	8				0.005	0.025
µg/L	16	9				0.5	5.2
µg/L	21	10	6	2	29%	1	5
µg/L	21	10				1	5

0.2	0.2	0.2	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	0.0078	0	
0.00106	0.02	0.011865714	W-1 (7/23/2010), W-13 (7/21/2010)	0.000052	6	384.6
0.00109	0.0155	0.003506667	W-13 (6/14/2011)	0.000052	15	298.1
0.018	0.3	0.133866667	W-1 (2/22/2010), W-1 (4/19/2010), W-1 (7/23/2010)	3.8	0	
0.02	1.46	0.27525625	VW-18A (6/14/2011)	3.8	0	
0.5	12.8	4.151363636	W-13 (6/14/2011)	0.46	11	27.8
0.001	0.001	0.001	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	0.025	0	
0.00227	0.0026	0.002435	W-5 (11/16/2011)	0.025	0	
0.778	29.6	8.933769231	W-2 (7/19/2010)	0.014	18	2114.3
5.3	8.1	6.7	VW-20B (8/31/2000)	5.6	1	1.4
0.542	0.542	0.542	W-2 (11/17/2011)	16	0	
0.0004	0.076	0.009730769	W-2 (10/20/2010)	0.0092	3	8.3
0.000505	0.00151	0.001045143	W-5 (11/16/2011)	0.0092	0	
75	110	92.5	VW-19A (8/31/2000)		0	
1	150	22.3	W-13 (11/17/2011)	78	2	1.9
1.84	1.99	1.915	VW-20A (11/14/2011)	21000	0	
0.02	0.068	0.0296	VW-19A (8/31/2000)		0	
14.2	300	125.1166667	VW-19A (8/31/2000)	36	4	8.3

	0			0	
0.01	3	2.0		0	
0.01	2	1.6		0	
2	0			0	
2	0			0	
5	7	2.6	92	0	
0.004	0			0	
0.004	0			0	
	0		850	0	
6	1	1.4		0	
	0			0	
0.005	3	15.2		0	
0.005	0			0	
	0			0	
100	2	1.5	2400	0	
	0		120000	0	
0.1	0			0	
70	4	4.3		0	

Cobalt
Cobalt, dissolved
Copper
Copper, dissolved
Cyanide
Dibenzo (a,h) anthracene
Dibenzofuran
Dibromochloromethane
Dichlorodifluoromethane
Diethyl phthalate
Dimethyl phthalate
Di-n-butylphthalate
Di-n-octylphthalate
Ethylbenzene
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3-c,d) pyrene
Iron
Iron, dissolved
Isophorone
Isopropylbenzene
Lead
Lead, dissolved
Manganese
Manganese, dissolved
Mercury
Mercury, dissolved
Methylene bromide
Methylene chloride
Monobromobenzene
M-Xylene (1,3-Dimethylbenzene)
Naphthalene
n-Butylbenzene
Nickel
Nickel, dissolved
Nitrate Nitrogen

mg/L	5	4	4	4	80%	0.02	0.02
mg/L	22	8	13	6	59%	0.02	0.1
mg/L	5	4	4	4	80%	0.02	0.02
mg/L	14	8				0.02	0.1
mg/L	4	4	4	4	100%		
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	21	10				1	5
µg/L	17	9				1	10
µg/L	16	9	1	1	6%	0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9	2	2	13%	0.5	5.2
µg/L	16	9				2	5.2
µg/L	21	10				1	5
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				2	5.2
µg/L	17	9	1	1	6%	0.5	5.2
µg/L	16	9				0.5	5.2
mg/L	1	1	1	1	100%		
mg/L	16	8	16	8	100%		
µg/L	25	11	9	4	36%	0.5	5.2
µg/L	2	2				5	5
mg/L	7	6	5	5	71%	0.001	0.005
mg/L	22	8				0.001	0.001
mg/L	1	1	1	1	100%		
mg/L	22	8	22	8	100%		
mg/L	7	6	4	4	57%	0.0002	0.0002
mg/L	16	8				0.0002	0.0002
µg/L	2	2				5	5
µg/L	21	10				1	25
µg/L	2	2				5	5
µg/L	2	2				5	5
µg/L	28	11	13	4	46%	0.5	5.2
µg/L	2	2				5	5
mg/L	5	4	4	4	80%	0.04	0.04
mg/L	14	8	4	2	29%	0.04	0.2
mg/L	2	2	1	1	50%	0.05	0.05

0.005	0.06	0.02125	W-8A (7/21/2010)	0.006	3	10.0
0.0037	0.0415	0.024054615	W-5 (11/16/2011)	0.006	11	6.9
0.003	0.006	0.0045	W-2 (7/19/2010), W-1 (7/23/2010)	0.8	0	
0.02	0.02	0.02	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	0.0015	0	
6.41	6.41	6.41	W-2 (11/17/2011)	15000	0	
0.559	0.659	0.609	W-2 (11/17/2011)	900	0	
5.13	5.13	5.13	VW-20A (6/1/2011)	0.33	1	15.5
0.491	0.491	0.491	W-2 (6/2/2011)	14	0	
0.186	235	38.733125	VW-18A (6/14/2011)	14	8	16.8
0.34	1.52	0.602222222	W-8A (2/17/2010), W-8A (4/19/2010)	78	0	
0.005	0.05	0.0242	W-1 (7/23/2010)		0	
9.67	9.67	9.67	W-2 (6/2/2011)	0.43	1	22.5
0.597	20.9	6.536090909	W-5 (10/28/2015)	0.43	22	48.6
0.002	0.002	0.002	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	0.00063	0	
0.61	1.15	0.651538462	W-13 (11/17/2011)	0.17	1	6.8
0.01	0.12	0.045	W-13 (7/21/2010)	0.39	0	
0.0448	0.113	0.075475	W-13 (6/14/2011)	0.39	0	
0.15	0.15	0.15	VW-20B (8/31/2000)	32	0	

	0			0	
	0			0	
1.3	0			0	
0.2	0		0.0035	0	
	0			0	
	0			0	
	0		110	0	
	0			0	
	0			0	
	0			0	
0.015	2	3.3		0	
	0			0	
	0			0	
0.002	0		0.0061	0	
	0		310	0	
	0			0	
	0			0	
10	0			0	

Nitrobenzene
n-Nitrosodi-n-propylamine
n-Nitrosodiphenylamine
n-Propylbenzene
o-Xylene
Paraldehyde
p-Cresol
Pentachlorophenol
Phenanthrene
Phenol
p-Isopropyltoluene
p-Xylene
Pyrene
sec-Butylbenzene
Selenium
Selenium, dissolved
Silver
Silver, dissolved
Silvex
Styrene
Sulfate (AS SO4)
tert-Butyl Methyl Ether
tert-Butylbenzene
Tetrachloroethene
Thallium
Thallium, dissolved
Tin
Toluene
Total Organic Carbon
Toxaphene
Trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethylene
Trichlorofluoromethane
Vanadium
Vinyl acetate

µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	2	2				5	5
µg/L	2	2				5	5
µg/L	27	10	16	5	59%	50	50
µg/L	2	2				5	5.2
µg/L	16	9				2	26
µg/L	16	9				0.5	5.2
µg/L	16	9				0.5	5.2
µg/L	2	2				5	5
µg/L	2	2				5	5
µg/L	16	9				0.5	5.2
µg/L	2	2				5	5
mg/L	7	6	5	4	71%	0.01	0.01
mg/L	16	8	16	8	100%		
mg/L	7	6	4	4	57%	0.01	0.01
mg/L	16	8				0.01	0.05
µg/L	4	4	4	4	100%		
µg/L	21	10				1	5
mg/L	2	2	2	2	100%		
µg/L	19	10				5	25
µg/L	2	2				5	5
µg/L	27	10	6	3	22%	1	5
mg/L	5	4	4	4	80%	0.0002	0.0002
mg/L	16	8				0.0002	0.0002
mg/L	4	4	4	4	100%		
µg/L	21	10				1	5
mg/L	12	4	12	4	100%		
µg/L	4	4	4	4	100%		
µg/L	21	10	2	1	10%	1	5
µg/L	21	10				1	5
µg/L	27	10	8	2	30%	1	5
µg/L	23	9	10	4	43%	1	10
mg/L	4	4	4	4	100%		
µg/L	21	10				10	50

50	194	92.23	W-13 (7/21/2010)		0	
0.00231	0.02	0.016462	W-2 (7/19/2010), W-13 (7/21/2010), W-1 (7/23/2010), W-8A (7/21/2010)	0.1	0	
0.00133	0.00797	0.002896875	W-13 (11/17/2011)	0.1	0	
0.003	0.003	0.003	W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010), W-2 (7/19/2010)	0.094	0	
10	10	10	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	110	0	
36	130	83	VW-19A (8/31/2000)		0	
1.52	38.5	23.00333333	VW-20A (11/14/2011)	11	5	3.5
0.005	0.01	0.00725	W-2 (7/19/2010)	0.0002	2	50.0
0.05	0.05	0.05	W-2 (7/19/2010), W-1 (7/23/2010), W-13 (7/21/2010), W-8A (7/21/2010)	12	0	
0.9	46.1	9.291666667	W-13 (7/21/2010)		0	
1	1	1	W-2 (7/19/2010), W-8A (7/21/2010), W-1 (7/23/2010), W-13 (7/21/2010)	0.071	0	
1.42	2.32	1.87	VW-19A (11/14/2011)	360	0	
5.2	48	20.25875	VW-19A (8/31/2000)	0.49	8	98.0
1.19	1030	315.616	VW-19A (6/1/2011)	5200	0	
0.05	0.05	0.05	W-2 (7/19/2010), W-1 (7/23/2010), W-13 (7/21/2010), W-8A (7/21/2010)		0	

	0			0	
0.05	0			0	
0.05	0			0	
	0			0	
50	0			0	
	0			0	
5	5	7.7	340	0	
0.002	2	5.0		0	
	0			0	
	0			0	
3	0			0	
100	0			0	
5	8	9.6	29	2	1.7
	0			0	
	0			0	

Vinyl chloride
VOCs, Total
Xylenes, Total
Zinc

Notes:
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk e

µg/L	27	10	8	2	30%	1	10
µg/L	39	12	24	9	62%	0	0
µg/L	19	10				5	25
mg/L	4	4	4	4	100%		

qual to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

17.6	78	33.775	VW-19A (8/31/2000)	0.019	8	4105.3
2.4	2625.68	470.2141667	VW-19A (11/14/2011)		0	
0.01	0.06	0.03	W-1 (7/23/2010)	6	0	

2	8	39.0	29	3	2.7
	0			0	
	0			0	

Notes:
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenar

io, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average

Appendix B; Table B-2 - Exposure Unit 2
Corrective Measures Proposal
Union Carbide Corporation Institute Facility,
Institute, West Virginia

Analyte Name
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,1-Dichloropropene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (EDB)
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,3-Dichloropropane
1,4-Dichlorobenzene
2,2-dichloropropane
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Butanone
2-Chloroethyl vinyl ether
2-Chloronaphthalene

Result Units	No. of Samples	No. of Locations	Detect Sample Count	Detect Location Count	Frequency of Detection	Minimum Non-Detect Result	Maximum Non-Detect Result	Minimum Detect Result	Maximum Detect Result
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				25	25		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				100	100		
µg/L	2	2				10	10		
µg/L	2	2				5	5		

Average Detected Result	Location (Date) of Max. Detect	Tap Water RSL	No. of Exceedances	Ratio of Max. Exceedance / RSL	MCL	No. of Exceedances	Ratio of Max. Exceedance / MCL	VISL	No. of Exceedances

Ratio of Max. Exceedance / VISL

2-Chlorophenol
2-Chlorotoluene
2-Hexanone
2-Methylnaphthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3,3'-Dichlorobenzidine
3-Methylphenol
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl ether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether
4-Chlorotoluene
4-Methyl-2-pentanone
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Acetone
Anthracene
Arsenic
Barium
Benzene
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (g,h,i) perylene
Benzo(k)fluoranthene
Benzoic Acid
Benzyl alcohol
Bis (2-chloroethoxy) methane
Bis (2-chloroethyl) ether
Bis (2-chloroisopropyl) ether
Bis (2-ethylhexyl) phthalate
Bromodichloromethane
Bromoform
Bromomethane

µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				10	10		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				25	25		
µg/L	2	2				5	5		
µg/L	2	2				10	10		
µg/L	2	2				5	5		
µg/L	2	2				25	25		
µg/L	2	2				25	25		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				10	10		
µg/L	2	2				25	25		
µg/L	2	2				25	25		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				100	100		
µg/L	2	2				5	5		
mg/L	2	2	2	2	1			0.00383	0.013
mg/L	2	2	2	2	1			0.072	0.28
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				25	25		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2	1	1	0.5	5	5	6.1	6.1
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				10	10		

0.008415	VW-22A (8/29/2000)	0.000052	2	250.0	0.01	1	1.3		0
0.176	VW-22A (8/29/2000)	3.8	0		2	0			0
6.1	VW-23A (8/29/2000)	5.6	1	1.1	6	1	1.0		0

Butyl benzylphthalate
Cadmium
Carbon disulfide
Carbon tetrachloride
Chloride
Chlorobenzene
Chlorobromomethane
Chloroethane
Chloroform
Chloromethane
Chromium
Chrysene
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Dibenzo (a,h) anthracene
Dibenzofuran
Dibromochloromethane
Dichlorodifluoromethane
Diethyl phthalate
Dimethyl phthalate
Di-n-butylphthalate
Di-n-octylphthalate
Ethylbenzene
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3-c,d) pyrene
Isophorone
Isopropylbenzene
Lead
Mercury
Methylene bromide
Methylene chloride
Monobromobenzene
M-Xylene (1,3-Dimethylbenzene)
Naphthalene
n-Butylbenzene

µg/L	2	2				5	5		
mg/L	2	2				0.01	0.01		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
mg/L	2	2	2	2	1			13	30
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				10	10		
µg/L	2	2				5	5		
µg/L	2	2				10	10		
mg/L	2	2	1	1	0.5	0.02	0.02	0.044	0.044
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				10	10		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
mg/L	2	2	2	2	1			0.011	0.036
mg/L	2	2				0.0002	0.0002		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		

21.5	VW-23A (8/29/2000)		0			0			0
0.044	VW-22A (8/29/2000)		0		0.1	0			0
0.0235	VW-22A (8/29/2000)		0		0.015	1	2.4		0

Nitrate Nitrogen
Nitrobenzene
n-Nitrosodi-n-propylamine
n-Nitrosodiphenylamine
n-Propylbenzene
o-Xylene
p-Cresol
Pentachlorophenol
Phenanthrene
Phenol
p-Isopropyltoluene
p-Xylene
Pyrene
sec-Butylbenzene
Selenium
Silver
Styrene
Sulfate (AS SO4)
tert-Butylbenzene
Tetrachloroethene
Toluene
Trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethylene
Trichlorofluoromethane
Vinyl acetate
Vinyl chloride
VOCs, Total

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target c

mg/L	2	2				0.05	0.05		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				25	25		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
mg/L	2	2				0.01	0.01		
mg/L	2	2				0.01	0.01		
µg/L	2	2				5	5		
mg/L	2	2	2	2	1			4.4	100
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				5	5		
µg/L	2	2				10	10		
µg/L	2	2				10	10		
µg/L	2	2				10	10		
µg/L	2	2				0	0		

:ancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

52.2	VW-23A (8/29/2000)		0			0			0

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenaric

›, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1,

Appendix B; Table B-3 - Exposure Unit 3
Corrective Measures Proposal
Union Carbide Corporation Institute Facility,
Institute, West Virginia

Analyte Name
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,1-Dichloropropene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (EDB)
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,3-Dichloropropane
1,4-Dichlorobenzene
2,2-dichloropropane
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Butanone
2-Chloroethyl vinyl ether
2-Chloronaphthalene

Result Units	No. of Samples	No. of Locations	Detect Sample Count	Detect Location Count	Frequency of Detection	Minimum Non-Detect Result	Maximum Non-Detect Result	Minimum Detect Result	Maximum Detect Result
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	32	9	1	1	0.03125	1	50	5.79	5.79
µg/L	32	9				1	50		
µg/L	32	9	3	1	0.09375	1	50	7.29	9.18
µg/L	32	9	4	1	0.125	1	50	5.12	7.66
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	18	9				1	50		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	32	9	2	1	0.0625	1	50	3.4	3.45
µg/L	32	9				1	50		
µg/L	18	9				1	50		
µg/L	18	9				1	50		
µg/L	1	1				5	5		
µg/L	32	9				1	50		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				25	25		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	32	9				5	500		
µg/L	1	1				10	10		
µg/L	1	1				5	5		

Average Detected Result	Location (Date) of Max. Detect	Tap Water RSL	No. of Exceedances	Ratio of Max. Exceedance / RSL	MCL	No. of Exceedances	Ratio of Max. Exceedance / MCL	VISL	No. of Exceedances
5.79	TW-54B (10/23/2015)	0.076	1	76.2		0		200	0
8.353333333	TW-55 (10/29/2013)	2.8	3	3.3		0		430	0
6.78	TW-55 (10/15/2012)	280	0		7	2	1.1	1000	0
3.425	TW-59B (10/22/2015)	0.17	2	20.3	5	0		130	0

Ratio of Max. Exceedance / VISL

2-Chlorophenol
2-Chlorotoluene
2-Hexanone
2-Methylnaphthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3,3'-Dichlorobenzidine
3-Methylphenol
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl ether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether
4-Chlorotoluene
4-Methyl-2-pentanone
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Acetone
Anthracene
Arsenic
Barium
Benzene
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (g,h,i) perylene
Benzo(k)fluoranthene
Benzoic Acid
Benzyl alcohol
Bis (2-chloroethoxy) methane
Bis (2-chloroethyl) ether
Bis (2-chloroisopropyl) ether
Bis (2-ethylhexyl) phthalate
Bromodichloromethane
Bromoform
Bromomethane

µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	18	9				5	250		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				25	25		
µg/L	1	1				5	5		
µg/L	1	1				10	10		
µg/L	1	1				5	5		
µg/L	1	1				25	25		
µg/L	1	1				25	25		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	32	9				5	250		
µg/L	1	1				25	25		
µg/L	1	1				25	25		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	32	9	2	2	0.0625	5	1250	32.1	35.1
µg/L	1	1				5	5		
mg/L	1	1	1	1	1			0.0616	0.0616
mg/L	1	1	1	1	1			1.2	1.2
µg/L	33	9	12	3	0.363636364	1	50	82.9	9520
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				25	25		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	32	9				1	50		
µg/L	1	1				5	5		
µg/L	32	9				1	50		

33.6	TW-54B (1/14/2015)	14000	0			0		120000000	0
0.0616	TW-20 (8/29/2000)	0.000052	1	1184.6	0.01	1	6.2		0
1.2	TW-20 (8/29/2000)	3.8	0		2	0			0
3585.741667	TW-69A (10/31/2013)	0.46	12	20695.7	5	12	1904.0	92	11

103.5

Butyl benzylphthalate
Cadmium
Carbon disulfide
Carbon tetrachloride
Chloride
Chlorobenzene
Chlorobromomethane
Chloroethane
Chloroform
Chloromethane
Chromium
Chrysene
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Dibenzo (a,h) anthracene
Dibenzofuran
Dibromochloromethane
Dichlorodifluoromethane
Diethyl phthalate
Dimethyl phthalate
Di-n-butylphthalate
Di-n-octylphthalate
Ethyl ether
Ethylbenzene
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3-c,d) pyrene
Isophorone
Isopropylbenzene
Lead
Mercury
Methylene bromide
Methylene chloride
Monobromobenzene
M-Xylene (1,3-Dimethylbenzene)
Naphthalene

µg/L	1	1				5	5		
mg/L	1	1				0.01	0.01		
µg/L	32	9	1	1	0.03125	1	50	156	156
µg/L	32	9	24	6	0.75	5	50	41.5	1610
mg/L	1	1	1	1	1			5	5
µg/L	32	9				1	50		
µg/L	1	1				5	5		
µg/L	1	1				10	10		
µg/L	32	9	31	8	0.96875	5	5	13.9	10100
µg/L	32	9				1	50		
mg/L	1	1	1	1	1			0.25	0.25
µg/L	1	1				5	5		
µg/L	32	9	6	2	0.1875	1	50	26.9	109
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	32	9				1	50		
µg/L	32	9	24	7	0.75	1	50	1.28	1570
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	17	8				10	500		
µg/L	32	9				1	50		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
mg/L	2	1	1	1	0.5	0.1	0.1	0.17	0.17
mg/L	1	1	1	1	1			0.00023	0.00023
µg/L	1	1				5	5		
µg/L	32	9				1	250		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	32	9				1	50		

156	TW-70B (10/23/2015)	810	0			0		6600	0
528.5833333	TW-59B (11/13/2014)	0.46	24	3500.0	5	24	322.0	24	24
5	TW-20 (8/29/2000)		0			0			0
1677.806452	TW-42 (10/16/2012)	0.22	31	45909.1	80	22	126.3	46	23
0.25	TW-20 (8/29/2000)		0		0.1	1	2.5		0
57.31666667	TW-54B (10/23/2015)	36	5	3.0	70	2	1.6		0
301.1704167	TW-70B (10/31/2013)	200	8	7.9		0		41	17
0.17	TW-20 (8/29/2000)		0		0.015	1	11.3		0
0.00023	TW-20 (8/29/2000)	0.00063	0		0.002	0		0.0061	0

67.1
219.6
38.3

n-Butylbenzene
Nitrate Nitrogen
Nitrobenzene
n-Nitrosodi-n-propylamine
n-Nitrosodiphenylamine
n-Propylbenzene
o-Xylene
p-Cresol
Pentachlorophenol
Phenanthrene
Phenol
p-Isopropyltoluene
p-Xylene
Pyrene
sec-Butylbenzene
Selenium
Silver
Styrene
Sulfate (AS SO4)
tert-Butylbenzene
Tetrachloroethene
Toluene
Trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethylene
Trichlorofluoromethane
Vinyl acetate
Vinyl chloride
VOCs, Total
Xylenes, Total

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target c

µg/L	1	1				5	5		
mg/L	1	1	1	1	1			0.26	0.26
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				25	25		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
µg/L	1	1				5	5		
mg/L	1	1				0.05	0.05		
mg/L	1	1				0.01	0.01		
µg/L	32	9				1	50		
mg/L	1	1	1	1	1			28	28
µg/L	1	1				5	5		
µg/L	33	9	8	2	0.242424242	1	50	606	4240
µg/L	32	9				1	50		
µg/L	32	9				1	50		
µg/L	1	1				5	5		
µg/L	33	9	3	1	0.090909091	1	50	13.2	24.2
µg/L	33	9	31	8	0.939393939	1	10	1.96	12200
µg/L	1	1				10	10		
µg/L	33	9				1	50		
µg/L	33	9	32	8	0.96969697	0	0	70	21467
µg/L	31	8				1	250		

:ancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

0.26	TW-20 (8/29/2000)	32	0		10	0			0
28	TW-20 (8/29/2000)		0			0			0
3300.75	TW-54B (10/30/2013)	11	8	385.5	5	8	848.0	340	8
19.7	TW-54B (10/23/2015)	0.49	3	49.4	5	3	4.8	29	0
2396.310968	TW-70B (10/19/2012)	5200	5	2.3		0			0
6760.551563	TW-70B (10/19/2012)		0			0			0

12.5

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenaric and a site-specific, average groundwater temperature equal to 19 degrees Celsius

›, a target cancer risk equal to -05, a non-cancer hazard quotient equal to 1,

Appendix B; Table B-4 - Exposure Unit 4
Corrective Measures Proposal
Union Carbide Corporation Institute Facility,
Institute, West Virginia

Analyte Name
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloroethene
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,4-Dioxane (p-Dioxane)
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Butanone
2-Chloronaphthalene
2-Chlorophenol
2-Hexanone
2-Methylnaphthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3,3'-Dichlorobenzidine
3-Methylphenol & 4-Methylphenol

Result Units	No. of Samples	No. of Locations	Detect Sample Count	Detect Location Count	Frequency of Detection	Minimum Non-Detect Result	Maximum Non-Detect Result	Minimum Detect Result	Maximum Detect Result
µg/L	3	1				1	5		
µg/L	27	7				1	5		
µg/L	27	7				1	5		
µg/L	27	7	7	2	0.259259259	1	5	2.66	5.27
µg/L	27	7				1	5		
µg/L	3	1				5	5.56		
µg/L	12	6				1	1		
µg/L	3	1				5	5.56		
µg/L	27	7	4	1	0.148148148	1	5	20.7	34.7
µg/L	3	1				1	5		
µg/L	27	7				1	5		
µg/L	12	6				1	1		
µg/L	15	7				1	5.56		
µg/L	27	7				1	5.56		
µg/L	19	5	12	3	0.631578947	1	100	3.87	55.4
µg/L	3	1				5.56	27.2		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				25	27.8		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	27	7				5	10		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	15	7				5	10		
µg/L	19	5	2	1	0.105263158	0.5	5.56	6.12	9.03
µg/L	3	1				5	5.56		
µg/L	3	1				25	27.8		
µg/L	3	1				5	5.56		
µg/L	3	1				10	27.8		
µg/L	3	1				5	5.56		

Average Detected Result	Location (Date) of Max. Detect	Tap Water RSL	No. of Exceedances	Ratio of Max. Exceedance / RSL	MCL	No. of Exceedances	Ratio of Max. Exceedance / MCL	VISL	No. of Exceedances	Ratio of Max. Exceedance / VISL
3.455714286	TW-52A (11/11/2014)	2.8	6	1.9		0		430	0	
27.275	VW-15B (10/15/2012)	0.17	4	204.1	5	4	6.9	130	0	
21.95333333	TW-60A (10/15/2012)	0.46	12	120.4		0		180000	0	
7.575	TW-60A (10/26/2013)	36	0			0			0	

3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl ether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether
4-Methyl-2-pentanone
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Acetone
Acrylonitrile
Anthracene
Arsenic, dissolved
Barium, dissolved
Benzene
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (g,h,i) perylene
Benzo(k)fluoranthene
Bis (2-chloroethoxy) methane
Bis (2-chloroethyl) ether
Bis (2-chloroisopropyl) ether
Bis (2-ethylhexyl) phthalate
Bromodichloromethane
Bromoform
Bromomethane
Butyl benzylphthalate
Cadmium, dissolved
Carbazole
Carbon Dioxide
Carbon disulfide
Carbon tetrachloride
Chloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane

µg/L	3	1				25	27.8		
µg/L	3	1				25	27.8		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	27	7				5	10		
µg/L	3	1				25	27.8		
µg/L	3	1				25	27.8		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	27	7				5	25		
µg/L	3	1				20	100		
µg/L	3	1				5	5.56		
mg/L	2	2	2	2	1			0.00183	0.00221
mg/L	2	2	2	2	1			0.0104	0.186
µg/L	27	7	4	1	0.148148148	1	5	1.67	2.77
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	19	5				0.5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	19	5	8	2	0.421052632	0.5	5.56	9.26	34.2
µg/L	19	5	8	2	0.421052632	0.5	5.56	8.48	70.9
µg/L	19	5	1	1	0.052631579	5	6.1	33.4	33.4
µg/L	27	7				1	5		
µg/L	3	1				1	5		
µg/L	27	7				1	10		
µg/L	3	1				5	5.56		
mg/L	2	2	1	1	0.5	0.0005	0.0005	0.00378	0.00378
µg/L	3	1				5	11.1		
µg/L	1	1	1	1	1			25000	25000
µg/L	27	7				1	5		
µg/L	27	7				1	5		
mg/L	1	1	1	1	1			11.2	11.2
µg/L	27	7				1	5		
µg/L	3	1				2	10		
µg/L	27	7				1	5		
µg/L	27	7				1	10		

0.00202	VW-15B (10/15/2012)	0.000052	2	42.5	0.01	0			0	
0.0982	VW-15B (10/15/2012)	3.8	0		2	0			0	
2.2425	TW-52B (10/26/2013)	0.46	4	6.0	5	0		92	0	
23.895	TW-52A (10/11/2012)	0.014	8	2442.9		0		850	0	
42.26	TW-52B (11/12/2014)	710	0			0			0	
33.4	TW-18 (12/8/2004)	5.6	1	6.0	6	1	5.6		0	
0.00378	VW-15A (10/10/2012)	0.0092	0		0.005	0			0	
25000	TW-18 (10/18/2006)		0			0			0	
11.2	TW-18 (10/18/2006)		0			0			0	

Chromium, dissolved
Chrysene
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Dibenzo (a,h) anthracene
Dibenzofuran
Dibromochloromethane
Dichlorodifluoromethane
Diethyl phthalate
Dimethyl phthalate
Di-n-butylphthalate
Di-n-octylphthalate
Dissolved Organic Carbon
Ethane
Ethyl ether
Ethylbenzene
Ethylene
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3-c,d) pyrene
Iron
Iron, dissolved
Iron, Ferrous
Isophorone
Lead, dissolved
Manganese, dissolved
Mercury, dissolved
Methane
Methylene chloride
Naphthalene
Nitrate Nitrogen
Nitrobenzene
n-Nitrosodi-n-propylamine
n-Nitrosodiphenylamine
Pentachlorophenol
Phenanthrene

mg/L	2	2				0.005	0.005		
µg/L	3	1				5	5.56		
µg/L	24	6	4	1	0.166666667	1	1	2.38	3.21
µg/L	3	1				1	5		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	27	7				1	5		
µg/L	24	6	3	1	0.125	1	1	1.22	1.97
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1	1	1	0.333333333	5	5.43	5.73	5.73
mg/L	1	1	1	1	1			4.04	4.04
µg/L	1	1				5	5		
µg/L	12	6	4	2	0.333333333	10	10	20	98.2
µg/L	27	7				1	5		
µg/L	1	1				5	5		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				5	27.8		
µg/L	19	5				0.5	5.56		
µg/L	3	1				5	5.56		
mg/L	1	1	1	1	1			63.4	63.4
mg/L	2	2	2	2	1			0.927	45
mg/L	1	1	1	1	1			0.0749	0.0749
µg/L	19	5				0.5	5.56		
mg/L	2	2				0.001	0.001		
mg/L	2	2	2	2	1			0.793	9.51
mg/L	2	2				0.0002	0.0002		
µg/L	1	1	1	1	1			33	33
µg/L	27	7				1	5		
µg/L	27	7	2	1	0.074074074	0.5	5.56	1.03	1.1
mg/L	1	1				0.6	0.6		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				5	5.56		
µg/L	3	1				25	27.8		
µg/L	3	1				5	5.56		

2.81	TW-52B (10/26/2013)	36	0		70	0			0	
1.633333333	VW-15B (10/15/2012)	200	0			0		41	0	
5.73	TW-18 (5/24/2005)	200	0			0			0	
4.04	TW-18 (10/18/2006)		0			0			0	
53.95	VW-15B (11/13/2014)	3900	0			0			0	
63.4	TW-18 (10/18/2006)	14	1	4.5		0			0	
22.9635	VW-15B (10/15/2012)	14	1	3.2		0			0	
0.0749	TW-18 (10/18/2006)		0			0			0	
5.1515	VW-15A (10/10/2012)	0.43	2	22.1		0			0	
33	TW-18 (10/18/2006)		0			0			0	
1.065	TW-60A (11/12/2014)	0.17	2	6.5		0		310	0	

Phenol
Pyrene
Silver, dissolved
Styrene
Sulfate (AS SO4)
Tetrachloroethene
Toluene
Total Alkalinity as CaCO3
Trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethylene
Trichlorofluoromethane
Vinyl acetate
Vinyl chloride
VOCs, Total
Xylenes, Total

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target c

µg/L	19	5	1	1	0.052631579	0.5	5.56	1.33	1.33
µg/L	3	1				5	5.56		
mg/L	2	2				0.01	0.01		
µg/L	27	7				1	5		
mg/L	1	1	1	1	1			46.7	46.7
µg/L	27	7				1	5		
µg/L	27	7				1	5		
mg/L	1	1	1	1	1			69.4	69.4
µg/L	24	6	4	1	0.166666667	1	1	1	1.33
µg/L	3	1				1	5		
µg/L	27	7	4	1	0.148148148	1	5	3.63	4.99
µg/L	24	6				1	1		
µg/L	3	1				5	10		
µg/L	27	7				1	10		
µg/L	28	7	20	6	0.714285714	0	0	2.66	55.4
µg/L	27	7	2	1	0.074074074	1	5	1.51	3.23

:ancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

1.33	TW-52B (11/12/2014)	5800	0			0			0	
46.7	TW-18 (10/18/2006)		0			0			0	
69.4	TW-18 (10/18/2006)		0			0			0	
1.12	TW-52B (10/15/2012)	360	0		100	0			0	
4.28	TW-52B (10/26/2013)	0.49	4	10.2	5	0		29	0	
24.0575	TW-60A (10/15/2012)		0			0			0	
2.37	TW-60A (11/12/2014)	190	0		10000	0		2300	0	

Appendix B; Table B-4 - Exposure Unit 4

Corrective Measures Proposal

Union Carbide Corporation Institute Facility,

Institute, West Virginia

Notes

µg/L = micrograms per liter

mg/L = milligrams per liter

RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)

MCL = Maximum Contaminant Level

VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure sc
and a site-specific, average groundwater temperature equal to 19 degrees Celsius

:enario, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1,

Appendix B; Table B-5 - Exposure Unit 5
Corrective Measures Proposal
Union Carbide Corporation Institute Facility,
Institute, West Virginia

Analyte Name
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,1-Dichloropropene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (EDB)
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloroethene
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,3-Dichloropropane
1,4-Dichlorobenzene
1,4-Dioxane (p-Dioxane)
2,2-dichloropropane
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Butanone
2-Chloroethyl vinyl ether

Result Units	No. of Samples	No. of Locations	Detect Sample Count	Detect Location Count	Frequency of Detection	Minimum Non-Detect Result	Maximum Non-Detect Result	Minimum Detect Result	Maximum Detect Result
µg/L	9	6				5	50		
µg/L	14	7	5	3	0.357142857	5	50	27.7	502
µg/L	28	10				1	250		
µg/L	28	10	4	1	0.142857143	2.5	250	19.7	28.9
µg/L	28	10	4	2	0.142857143	1	250	8.48	210
µg/L	28	10	6	3	0.214285714	2.5	250	1.31	120
µg/L	9	6				5	50		
µg/L	9	6				5	50		
µg/L	9	6				5	50		
µg/L	14	7				2.5	53.2		
µg/L	18	10				2.5	250		
µg/L	9	6				5	50		
µg/L	9	6				5	50		
µg/L	14	7	6	2	0.428571429	2.5	10	21	290
µg/L	28	10	8	2	0.285714286	2.5	250	7.65	75.4
µg/L	3	1				5	5		
µg/L	28	10	3	1	0.107142857	2.5	250	3.03	3.62
µg/L	18	10				2.5	250		
µg/L	23	10	1	1	0.043478261	2.5	250	18	18
µg/L	9	6				5	50		
µg/L	28	10	2	1	0.071428571	1	250	6	26
µg/L	3	1	3	1	1			646	4110
µg/L	9	6				5	50		
µg/L	8	5				5	137		
µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	8	5				25	266		
µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	28	10				5	1250		
µg/L	9	6				10	100		

Average Detected Result	Location (Date) of Max. Detect	Tap Water RSL	No. of Exceedances	Ratio of Max. Exceedance / RSL	MCL	No. of Exceedances	Ratio of Max. Exceedance / MCL	VISL	No. of Exceedances	Ratio of Max. Exceedance / VISL
256.62	TW-29 (10/30/2002)	8000	0		200	2	2.5	41000	0	
23.825	TW-45 (10/16/2012)	0.28	4	103.2	5	4	5.8	36	0	
94.745	TW-29 (8/30/2000)	2.8	4	75.0		0		430	0	
45.655	TW-29 (8/30/2000)	280	0		7	4	17.1	1000	0	
136.4	TW-04 (8/30/2000)	300	0		600	0		17000	0	
36.18375	TW-46 (10/23/2015)	0.17	8	443.5	5	8	15.1	130	0	
3.276666667	TW-45 (10/16/2012)	0.44	3	8.2	5	0		140	0	
18	TW-04 (8/30/2000)		0			0			0	
16	TW-04 (8/30/2000)	0.48	2	54.2	75	0		170	0	
1852	TW-03 (10/30/2004)	0.46	3	8934.8		0		180000	0	

2-Chloronaphthalene
2-Chlorophenol
2-Chlorotoluene
2-Hexanone
2-Methylnaphthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3,3'-Dichlorobenzidine
3-Methylphenol
3-Methylphenol & 4-Methylphenol
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl ether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether
4-Chlorotoluene
4-Methyl-2-pentanone
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Acetone
Acrylonitrile
Anthracene
Antimony
Antimony, dissolved
Arsenic
Arsenic, dissolved
Barium
Barium, dissolved
Benzene
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (g,h,i) perylene
Benzo(k)fluoranthene
Benzoic Acid
Benzyl alcohol

µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	9	6				5	50		
µg/L	23	10				10	1250		
µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	8	5				25	266		
µg/L	8	5				5	53.2		
µg/L	7	4				5.15	266		
µg/L	3	3				5	5		
µg/L	5	3	1	1	0.2	10.3	53.2	11.4	11.4
µg/L	7	4				25	266		
µg/L	8	5				25	266		
µg/L	8	5				5	53.2		
µg/L	8	5	1	1	0.125	5	27.5	83.7	83.7
µg/L	7	4				5	53.2		
µg/L	8	5				5	53.2		
µg/L	9	6				5	50		
µg/L	28	10				5	1250		
µg/L	7	4				25	266		
µg/L	8	5				25	266		
µg/L	8	5				0.053	53.2		
µg/L	8	5				0.053	53.2		
µg/L	28	10	3	2	0.107142857	12.5	2500	16.1	28.9
µg/L	5	3				25	100		
µg/L	8	5				0.053	53.2		
mg/L	2	1	2	1	1			0.00108	0.00155
mg/L	1	1	1	1	1			0.00466	0.00466
mg/L	11	6	7	4	0.636363636	0.004	0.1	0.0057	0.123
mg/L	4	2	4	2	1			0.00269	0.0102
mg/L	9	6	9	6	1			0.0162	1.4
mg/L	3	2	3	2	1			0.212	1.51
µg/L	28	10	8	3	0.285714286	2.5	250	12	43.5
µg/L	8	5				0.053	53.2		
µg/L	8	5				0.053	53.2		
µg/L	8	5				0.053	53.2		
µg/L	8	5				0.053	53.2		
µg/L	8	5				0.053	53.2		
µg/L	3	3				25	25		
µg/L	3	3				5	5		

11.4	TW-03 (2/24/2005)		0			0			0	
83.7	TW-03 (6/7/2005)	1400	0			0			0	
23.73333333	TW-45 (10/22/2015)	14000	0			0		120000000	0	
0.001315	TW-03 (10/30/2004)	0.0078	0		0.006	0			0	
0.00466	TW-03 (10/30/2004)	0.0078	0		0.006	0			0	
0.039935714	TW-29 (8/30/2000)	0.000052	7	2365.4	0.01	5	12.3		0	
0.0060325	TW-03 (10/30/2004)	0.000052	4	196.2	0.01	1	1.0		0	
0.405077778	TW-29 (8/30/2000)	3.8	0		2	0			0	
0.987333333	VW-11B (8/14/2012)	3.8	0		2	0			0	
21.9875	TW-03 (10/30/2004)	0.46	8	94.6	5	8	8.7	92	0	

Beryllium
Beryllium, dissolved
Bis (2-chloroethoxy) methane
Bis (2-chloroethyl) ether
Bis (2-chloroisopropyl) ether
Bis (2-ethylhexyl) phthalate
Bromodichloromethane
Bromoform
Bromomethane
Butyl benzylphthalate
Cadmium
Cadmium, dissolved
Carbazole
Carbon Dioxide
Carbon disulfide
Carbon tetrachloride
Chloride
Chlorobenzene
Chlorobromomethane
Chloroethane
Chloroform
Chloromethane
Chromium
Chromium, dissolved
Chrysene
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Cobalt, dissolved
Copper
Copper, dissolved
Dibenzo (a,h) anthracene
Dibenzofuran
Dibromochloromethane
Dichlorodifluoromethane
Diethyl phthalate
Dimethyl phthalate
Di-n-butylphthalate
Di-n-octylphthalate
Dissolved Organic Carbon
Ethane

mg/L	2	1				0.01	0.01		
mg/L	3	2				0.004	0.01		
µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	28	10				1	250		
µg/L	14	7				2.5	50		
µg/L	28	10				1	250		
µg/L	8	5				5	53.2		
mg/L	10	6				0.01	0.01		
mg/L	3	2				0.0005	0.01		
µg/L	5	3				10.8	106		
µg/L	1	1	1	1	1			75000	75000
µg/L	28	10	1	1	0.035714286	1	250	920	920
µg/L	28	10	11	5	0.392857143	1	250	23.5	560
mg/L	8	5	8	5	1			18	456
µg/L	28	10	6	2	0.214285714	1	250	163	1700
µg/L	9	6				5	50		
µg/L	14	7				2.5	100		
µg/L	28	10	20	7	0.714285714	5	50	14.3	13700
µg/L	28	10				1	250		
mg/L	10	6	3	3	0.3	0.02	0.02	0.062	0.36
mg/L	4	2				0.02	0.025		
µg/L	8	5				0.053	53.2		
µg/L	25	10	7	2	0.28	2.5	250	4.57	49.1
µg/L	14	7				2.5	50		
mg/L	2	1				0.001	0.001		
mg/L	2	1				0.02	0.02		
mg/L	1	1				0.02	0.02		
µg/L	8	5				0.053	53.2		
µg/L	8	5				5	53.2		
µg/L	28	10				1	250		
µg/L	23	10	15	5	0.652173913	10	100	20.7	1840
µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	8	5				5	55		
µg/L	8	5				5	53.2		
mg/L	3	2	3	2	1			2.76	5.42
µg/L	3	2	2	2	0.666666667	0.5	0.5	5.3	5.64

75000	TW-29 (10/19/2006)		0			0			0	
920	TW-56 (10/23/2015)	810	1	1.1		0		6600	0	
277.8909091	TW-29 (8/30/2000)	0.46	11	1217.4	5	11	112.0	24	10	23.3
110.875	TW-51 (4/10/2008)		0			0			0	
567.5	TW-04 (8/30/2000)	78	6	21.8	100	6	17.0	2400	0	
2332.85	TW-56 (1/14/2015)	0.22	20	62272.7	80	13	171.3	46	15	297.8
0.172666667	TW-29 (8/30/2000)		0		0.1	1	3.6		0	
27.72285714	TW-46 (11/17/2014)	36	4	1.4	70	0			0	
751.0533333	TW-56 (1/14/2015)	200	12	9.2		0		41	14	44.9
3.953333333	TW-51 (4/10/2008)		0			0			0	
5.47	TW-51 (4/10/2008)		0			0			0	

Ethyl ether
Ethylbenzene
Ethylene
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3-c,d) pyrene
Iron
Iron, dissolved
Iron, Ferrous
Isophorone
Isopropylbenzene
Lead
Lead, dissolved
m,p-Xylene
Manganese, dissolved
Mercury
Mercury, dissolved
Methane
Methylene bromide
Methylene chloride
Monobromobenzene
M-Xylene (1,3-Dimethylbenzene)
Naphthalene
n-Butylbenzene
Nickel
Nickel, dissolved
Nitrate Nitrogen
Nitrite Nitrogen
Nitrobenzene
n-Nitrosodi-n-propylamine
n-Nitrosodiphenylamine
n-Propylbenzene
o-Xylene
p-Cresol
Pentachlorophenol
Phenanthrene

µg/L	9	4	1	1	0.111111111	50	2500	26.9	26.9
µg/L	28	10	4	1	0.142857143	1	250	14.2	54.4
µg/L	3	2	1	1	0.333333333	0.5	0.5	6.8	6.8
µg/L	8	5				0.053	53.2		
µg/L	8	5				0.053	53.2		
µg/L	8	5				5	53.2		
µg/L	14	7				5	53.2		
µg/L	8	5				5	266		
µg/L	8	5				5	53.2		
µg/L	8	5				0.053	53.2		
mg/L	3	2	3	2	1			1.15	29.7
mg/L	4	3	3	2	0.75	0.1	0.1	11.6	229
mg/L	3	2	2	2	0.666666667	0.04	0.04	0.524	13.1
µg/L	8	5				5	53.2		
µg/L	9	6				5	50		
mg/L	11	6	4	4	0.363636364	0.001	0.1	0.00726	0.46
mg/L	4	2				0.001	0.005		
µg/L	6	6				5	50		
mg/L	4	3	3	2	0.75	0.01	0.01	3.73	4.74
mg/L	10	6	2	2	0.2	0.0002	0.0002	0.00042	0.00065
mg/L	4	2				0.0002	0.0002		
µg/L	3	2	3	2	1			0.8	8.58
µg/L	9	6				5	50		
µg/L	28	10	5	2	0.178571429	2.5	500	7.52	404
µg/L	9	6				5	50		
µg/L	3	3				5	5		
µg/L	28	10	5	2	0.178571429	0.053	250	0.46	2370
µg/L	9	6				5	50		
mg/L	2	1				0.04	0.04		
mg/L	1	1				0.04	0.04		
mg/L	7	5	4	2	0.571428571	0.05	1.2	0.078	1.31
mg/L	2	2				0.4	0.8		
µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	8	5				5	53.2		
µg/L	9	6				5	50		
µg/L	9	6				5	50		
µg/L	3	3				5	5		
µg/L	8	5				25	266		
µg/L	8	5				0.053	53.2		

26.9	TW-45 (11/14/2014)	3900	0			0			0	
29.875	TW-03 (12/24/2002)	1.5	4	36.3	700	0		220	0	
6.8	TW-29 (10/19/2006)		0			0			0	
14.58333333	TW-29 (10/19/2006)	14	1	2.1		0			0	
143.8666667	VW-11B (8/14/2012)	14	2	16.4		0			0	
6.812	TW-51 (4/10/2008)		0			0			0	
0.167315	TW-29 (8/30/2000)		0		0.015	3	30.7		0	
4.14	VW-11B (8/14/2012)	0.43	3	11.0		0			0	
0.000535	VW-10A (8/30/2000)	0.00063	1	1.0	0.002	0		0.0061	0	
5.66	TW-51 (4/10/2008)		0			0			0	
170.49	TW-56 (1/14/2015)	11	3	36.7	5	5	80.8	25000	0	
981.892	TW-03 (12/24/2002)	0.17	5	13941.2		0		310	4	7.6
0.892	TW-29 (4/17/2008)	32	0		10	0			0	

Phenol
Phenolics, Total Recoverable
p-Isopropyltoluene
p-Xylene
Pyrene
sec-Butylbenzene
Selenium
Selenium, dissolved
Silver
Silver, dissolved
Styrene
Sulfate (AS SO4)
tert-Butyl Methyl Ether
tert-Butylbenzene
Tetrachloroethene
Thallium
Thallium, dissolved
Toluene
Total Alkalinity as CaCO3
Total Organic Carbon
Trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethylene
Trichlorofluoromethane
Vinyl acetate
Vinyl chloride
VOCs, Total
Xylenes, Total
Zinc
Zinc, dissolved

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target c

µg/L	8	5	1	1	0.125	5	27.5	95.1	95.1
µg/L	1	1	1	1	1			140	140
µg/L	9	6				5	50		
µg/L	3	3				5	5		
µg/L	8	5				0.053	53.2		
µg/L	9	6				5	50		
mg/L	10	6	2	1	0.2	0.01	0.1	0.00396	0.004
mg/L	3	2	3	2	1			0.00133	0.003
mg/L	10	6				0.01	0.01		
mg/L	3	2				0.01	0.02		
µg/L	28	10				1	250		
mg/L	7	5	6	4	0.857142857	5	5	6.4	400
µg/L	2	2				12.5	50		
µg/L	9	6				5	50		
µg/L	28	10	14	6	0.5	2.5	250	1.06	659
mg/L	2	1				0.0002	0.0005		
mg/L	3	2				0.0002	0.0002		
µg/L	28	10	4	1	0.142857143	1	250	14.5	63.7
mg/L	3	2	3	2	1			100	112
mg/L	2	1	2	1	1			13.7	33.8
µg/L	25	10				1	250		
µg/L	14	7				2.5	50		
µg/L	28	10	5	2	0.178571429	2.5	250	8.46	17.6
µg/L	23	10	19	8	0.826086957	10	10	9.83	31400
µg/L	14	7				10	100		
µg/L	28	10	4	1	0.142857143	2.5	250	34.3	55
µg/L	29	10	27	9	0.931034483	0	0	19.7	47344
µg/L	19	6	3	1	0.157894737	1	250	13.7	36
mg/L	2	1				0.02	0.02		
mg/L	1	1				0.02	0.02		

:ancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

95.1	TW-03 (6/7/2005)	5800	0			0			0	
140	TW-03 (10/30/2004)		0			0			0	
0.00398	TW-03 (10/30/2004)	0.1	0		0.05	0			0	
0.00199	TW-03 (10/30/2004)	0.1	0		0.05	0			0	
123.7166667	VW-10A (8/30/2000)		0			0			0	
284.235	TW-46 (11/17/2014)	11	11	59.9	5	12	131.8	340	6	1.9
30.175	TW-03 (12/24/2002)	1100	0		1000	0		110000	0	
107	TW-29 (4/17/2008)		0			0			0	
23.75	TW-03 (6/7/2005)		0			0			0	
12.852	TW-45 (11/14/2014)	0.49	5	35.9	5	5	3.5	29	0	
7349.059474	TW-56 (1/14/2015)	5200	5	6.0		0			0	
41.675	TW-45 (10/16/2012)	0.019	4	2894.7	2	4	27.5	29	4	1.9
8131.037778	TW-56 (1/14/2015)		0			0			0	
24.5	TW-03 (10/30/2004)	190	0		10000	0		2300	0	

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenar

:io, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1,

Appendix B; Table B-6 - Exposure Unit 6
Corrective Measures Proposal
Union Carbide Corporation Institute Facility,
Institute, West Virginia

Analyte Name
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,1-Dichloropropene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (EDB)
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,3-Dichloropropane
1,4-Dichlorobenzene
1,4-Dioxane (p-Dioxane)
2,2-dichloropropane
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Butanone
2-Chloroethyl vinyl ether
2-Chloronaphthalene
2-Chlorophenol
2-Chlorotoluene
2-Hexanone
2-Methylnaphthalene

Result Units	No. of Samples	No. of Locations	Detect Sample Count	Detect Location Count	Frequency of Detection	Minimum Non-Detect Result	Maximum Non-Detect Result	Minimum Detect Result	Maximum Detect Result	Average Detected Result
µg/L	2	1				5	50			
µg/L	12	5				1	50			
µg/L	70	21				1	1000			
µg/L	70	21	8	3	0.114285714	1	1000	7.69	84.9	40.54
µg/L	70	21	4	3	0.057142857	1	1000	1.08	3.97	2.555
µg/L	70	21	5	3	0.071428571	1	1000	1.75	2.93	2.162
µg/L	2	1				5	50			
µg/L	2	1				5	50			
µg/L	2	1				5	50			
µg/L	12	5				1	5			
µg/L	37	15	8	5	0.216216216	1	250	1.84	98	23.60625
µg/L	2	1				5	50			
µg/L	2	1				5	50			
µg/L	12	5				1	5			
µg/L	70	21	12	5	0.171428571	1	1000	1.02	2910	755.495
µg/L	70	21	2	2	0.028571429	1	1000	2.53	5.06	3.795
µg/L	37	15	4	3	0.108108108	1	250	2	6.38	4.5025
µg/L	47	17	2	1	0.042553191	1	250	2.1	2.48	2.29
µg/L	2	1				5	50			
µg/L	70	21	4	1	0.057142857	1	1000	3.51	9.75	5.9625
µg/L	12	5	8	3	0.666666667	1.1	1.27	5.77	23.2	12.87375
µg/L	2	1				5	50			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				25	25			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	70	21				5	10000			
µg/L	2	1				10	100			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	50			
µg/L	47	17				5	1250			
µg/L	10	5	1	1	0.1	0.51	5	0.527	0.527	0.527

Location (Date) of Max. Detect	Tap Water RSL	No. of Exceedances	Ratio of Max. Exceedance / RSL	MCL	No. of Exceedances	Ratio of Max. Exceedance / MCL	VISL	No. of Exceedances	Ratio of Max. Exceedance / VISL
TW-53 (10/16/2012)	0.28	8	303.2	5	8	17.0	36	4	2.4
TW-62B (10/28/2013)	2.8	2	1.4		0		430	0	
MW-103 (6/24/2013)	280	0		7	0		1000	0	
TW-17 (10/31/2002)	15	2	6.5		0		180	0	
TW-57 (1/14/2015)	0.17	12	17117.6	5	11	582.0	130	4	22.4
MW-103 (6/24/2013)	0.44	2	11.5	5	1	1.0	140	0	
TW-68 (4/14/2016)	120	0			0			0	
TW-62A (10/21/2015)		0			0			0	
TW-62A (10/21/2015)	0.48	4	20.3	75	0		170	0	
MW-103 (6/24/2013)	0.46	8	50.4		0		180000	0	
MW-103 (10/23/2013)	36	0			0			0	

2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3,3'-Dichlorobenzidine
3-Methylphenol
3-Methylphenol & 4-Methylphenol
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl ether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether
4-Chlorotoluene
4-Methyl-2-pentanone
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Acetone
Acrylonitrile
Anthracene
Arsenic
Arsenic, dissolved
Barium
Barium, dissolved
Benzene
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (g,h,i) perylene
Benzo(k)fluoranthene
Benzoic Acid
Benzyl alcohol
Bis (2-chloroethoxy) methane
Bis (2-chloroethyl) ether
Bis (2-chloroisopropyl) ether
Bis (2-ethylhexyl) phthalate
Bromodichloromethane
Bromoform
Bromomethane
Butyl benzylphthalate
Cadmium
Cadmium, dissolved
Carbon disulfide

µg/L	2	1				5	5			
µg/L	2	1				25	25			
µg/L	2	1				5	5			
µg/L	2	1				10	10			
µg/L	1	1				5	5			
µg/L	1	1				5	5			
µg/L	2	1				25	25			
µg/L	2	1				25	25			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	50			
µg/L	70	21				5	5000			
µg/L	2	1				25	25			
µg/L	2	1				25	25			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	70	21	5	4	0.071428571	5	25000	8.6	47.8	27.78
µg/L	10	4				5	50			
µg/L	2	1				5	5			
mg/L	4	2	2	1	0.5	0.01	0.01	0.0208	0.135	0.0779
mg/L	5	3	1	1	0.2	0.01	0.01	0.00316	0.00316	0.00316
mg/L	2	1	2	1	1			2.3	4.5	3.4
mg/L	1	1	1	1	1			0.155	0.155	0.155
µg/L	70	21	49	18	0.7	1	100	1.02	133000	21274.6651
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	10	5				0.5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				25	25			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	10	5	3	1	0.3	0.549	5	2.03	2.28	2.146666667
µg/L	10	5	3	1	0.3	0.549	5	1.4	1.91	1.67
µg/L	10	5				5	6.33			
µg/L	70	21				1	1000			
µg/L	12	5				1	50			
µg/L	70	21				1	1000			
µg/L	2	1				5	5			
mg/L	4	2				0.001	0.01			
mg/L	5	3	1	1	0.2	0.001	0.01	0.000518	0.000518	0.000518
µg/L	70	21	2	2	0.028571429	1	1000	44	733	388.5

TW-63B (1/14/2015)	14000	0			0		120000000	0	
TW-17 (8/30/2000)	0.000052	2	2596.2	0.01	2	13.5		0	
TW-67B (10/19/2012)	0.000052	1	60.8	0.01	0			0	
TW-17 (8/30/2000)	3.8	1	1.2	2	2	2.3		0	
TW-67B (10/19/2012)	3.8	0		2	0			0	
TW-78B (10/23/2012)	0.46	49	289130.4	5	46	26600.0	92	30	1445.7
MW-103 (10/20/2015)	0.014	3	162.9		0		850	0	
MW-103 (10/23/2013)	710	0			0			0	
TW-67B (10/19/2012)	0.0092	0		0.005	0			0	
TW-66B (10/20/2015)	810	0			0		6600	0	

Carbon tetrachloride
Chloride
Chlorobenzene
Chlorobromomethane
Chloroethane
Chloroform
Chloromethane
Chromium
Chromium, dissolved
Chrysene
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Dibenzo (a,h) anthracene
Dibenzofuran
Dibromochloromethane
Dichlorodifluoromethane
Diethyl phthalate
Dimethyl phthalate
Di-n-butylphthalate
Di-n-octylphthalate
Ethyl ether
Ethylbenzene
Ethylene Glycol
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3-c,d) pyrene
Iron, dissolved
Isophorone
Isopropanol
Isopropylbenzene
Lead
Lead, dissolved
m,p-Xylene
Manganese, dissolved
Mercury
Mercury, dissolved
Methylene bromide
Methylene chloride
Monobromobenzene
M-Xylene (1,3-Dimethylbenzene)

µg/L	70	21	3	1	0.042857143	1	1000	262	428	331.3333333
mg/L	1	1	1	1	1			5500	5500	5500
µg/L	70	21	4	1	0.057142857	1	1000	59	370	192.25
µg/L	2	1				5	50			
µg/L	12	5				1	100			
µg/L	70	21	9	3	0.128571429	1	1000	2.57	22400	8057.018889
µg/L	70	21				1	1000			
mg/L	4	2	1	1	0.25	0.005	0.02	0.3	0.3	0.3
mg/L	5	3				0.005	0.02			
µg/L	2	1				5	5			
µg/L	70	21	9	5	0.128571429	1	1000	1.06	214	77.07666667
µg/L	12	5				1	50			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	70	21				1	1000			
µg/L	64	20	12	4	0.1875	1	1000	1	4180	1352.555833
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	35	14	14	6	0.4	10	2500	15	5810	1204.657143
µg/L	70	21	19	8	0.271428571	1	1000	2.59	5000	616.6310526
µg/L	3	3				5000	5000			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	10	5				0.5	5			
µg/L	2	1				5	5			
mg/L	1	1	1	1	1			21.9	21.9	21.9
µg/L	10	5	1	1	0.1	0.5	5	0.596	0.596	0.596
µg/L	3	3				1000	1000			
µg/L	2	1	1	1	0.5	50	50	25	25	25
mg/L	2	1	2	1	1			0.0137	0.28	0.14685
mg/L	1	1				0.001	0.001			
µg/L	1	1				50	50			
mg/L	1	1	1	1	1			3.73	3.73	3.73
mg/L	2	1				0.0002	0.0002			
mg/L	1	1				0.0002	0.0002			
µg/L	2	1				5	50			
µg/L	70	21	3	1	0.042857143	1	5000	171	499	283
µg/L	2	1				5	50			
µg/L	1	1	1	1	1			17	17	17

TW-57 (10/30/2013)	0.46	3	930.4	5	3	85.6	24	3	17.8
TW-17 (8/30/2000)		0			0			0	
TW-62A (10/21/2013)	78	3	4.7	100	3	3.7	2400	0	
TW-57 (1/14/2015)	0.22	9	101818.2	80	4	280.0	46	4	487.0
TW-17 (8/30/2000)		0		0.1	1	3.0		0	
MW-103 (6/24/2013)	36	5	5.9	70	5	3.1		0	
TW-57 (1/14/2015)	200	8	20.9		0		41	8	102.0
TW-62B (10/21/2015)	3900	2	1.5		0			0	
TW-63B (1/14/2015)	1.5	19	3333.3	700	4	7.1	220	9	22.7
TW-67B (10/19/2012)	14	1	1.6		0			0	
TW-63A (10/19/2015)	78	0			0			0	
TW-17 (8/30/2000)	450	0			0		5800	0	
TW-17 (8/30/2000)		0		0.015	1	18.7		0	
TW-67B (10/19/2012)	0.43	1	8.7		0			0	
TW-57 (1/14/2015)	11	3	45.4	5	3	99.8	25000	0	
TW-17 (8/30/2000)	190	0			0		2100	0	

Naphthalene
n-Butylbenzene
Nitrate Nitrogen
Nitrobenzene
n-Nitrosodi-n-propylamine
n-Nitrosodiphenylamine
n-Propylbenzene
o-Xylene
p-Cresol
Pentachlorophenol
Phenanthrene
Phenol
p-Isopropyltoluene
p-Xylene
Pyrene
sec-Butylbenzene
Selenium
Silver
Silver, dissolved
Styrene
Sulfate (AS SO4)
tert-Butyl Methyl Ether
tert-Butylbenzene
Tetrachloroethene
Toluene
Trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethylene
Trichlorofluoromethane
Vinyl acetate
Vinyl chloride
VOCs, Total
Xylenes, Total

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk e

µg/L	65	20	19	6	0.292307692	1	1000	0.645	745	75.29078947
µg/L	2	1				5	50			
mg/L	1	1				0.05	0.05			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1				5	5			
µg/L	2	1	1	1	0.5	50	50	10	10	10
µg/L	2	1	2	1	1			57	87	72
µg/L	1	1				5	5			
µg/L	2	1				25	25			
µg/L	2	1				5	5			
µg/L	10	5	5	3	0.5	0.5	5	3.4	200	72.006
µg/L	2	1				5	50			
µg/L	1	1	1	1	1			5	5	5
µg/L	2	1				5	5			
µg/L	2	1				5	50			
mg/L	2	1	1	1	0.5	0.01	0.01	0.0123	0.0123	0.0123
mg/L	2	1	2	1	1			0.0111	0.016	0.01355
mg/L	1	1				0.01	0.01			
µg/L	70	21	4	1	0.057142857	1	1000	21.4	177	84.55
mg/L	1	1	1	1	1			4.8	4.8	4.8
µg/L	10	4				1	25			
µg/L	2	1				5	50			
µg/L	70	21	2	1	0.028571429	1	1000	1.07	1.49	1.28
µg/L	70	21	17	7	0.242857143	1	1000	1.08	1400	184.1994118
µg/L	70	21	1	1	0.014285714	1	1000	2.29	2.29	2.29
µg/L	12	5				1	50			
µg/L	70	21	8	4	0.114285714	1	1000	1.37	1080	523.35625
µg/L	64	20	11	4	0.171875	1	1000	1	7720	2265.779091
µg/L	12	5				5	100			
µg/L	70	21	15	6	0.214285714	1	1000	1.19	269	103.8493333
µg/L	70	21	65	21	0.928571429	0	0	1.19	133000	18365.45385
µg/L	68	20	15	4	0.220588235	1	5000	7.9	783	170.7153333

qual to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

TW-17 (10/31/2002)	0.17	19	4382.4		0		310	1	2.4
TW-17 (8/30/2000)	660	0			0		15000	0	
TW-17 (10/31/2002)	190	0			0		2900	0	
TW-63A (10/19/2015)	5800	0			0			0	
TW-17 (8/30/2000)	190	0			0		2200	0	
TW-17 (10/31/2002)	0.1	0		0.05	0			0	
TW-17 (8/30/2000)	0.094	0			0			0	
TW-68 (11/7/2014)	1200	0		100	1	1.8	56000	0	
TW-17 (8/30/2000)		0			0			0	
TW-58 (10/11/2012)	11	0		5	0		340	0	
TW-79B (6/1/2012)	1100	1	1.3	1000	1	1.4	110000	0	
MW-103 (6/24/2013)	360	0		100	0			0	
TW-77B (10/22/2012)	0.49	8	2204.1	5	6	216.0	29	6	37.2
TW-57 (10/23/2015)	5200	4	1.5		0			0	
TW-53 (10/16/2012)	0.019	15	14157.9	2	14	134.5	29	9	9.3
TW-78B (10/23/2012)		0			0			0	
TW-63B (1/14/2015)	190	4	4.1	10000	0		2300	0	

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

Analyte Name
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,1-Dichloropropene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (EDB)
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloroethene
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,3-Dichloropropane
1,4-Dichlorobenzene
1,4-Dioxane (p-Dioxane)
2,2-dichloropropane
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Butanone
2-Chloroethyl vinyl ether
2-Chloronaphthalene
2-Chlorophenol
2-Chlorotoluene
2-Hexanone
2-Methylnaphthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3,3'-Dichlorobenzidine
3-Methylphenol & 4-Methylphenol
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl ether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether

Result Units	No. of Samples	No. of Locations	Detect Sample Count	Detect Location Count	Frequency of Detection	Minimum Non-Detect Result	Maximum Non-Detect Result	Minimum Detect Result	Maximum Detect Result	Average Detected Result	Location (Date) of Max. Detect	Tap Water RSL	No. of Exceedances	Ratio of Max. Exceedance / RSL	MCL
µg/L	1	1				5	5								
µg/L	18	7				1	10								
µg/L	27	9				1	10								
µg/L	36	12	1	1	0.027777778	0.5	10	5.44	5.44	5.44	TW-01 (12/12/2013)	0.28	1	19.4	5
µg/L	36	12	12	5	0.333333333	0.5	10	1.23	31.1	5.680833333	TW-12 (11/2/2005)	2.8	6	11.1	
µg/L	36	12	2	2	0.055555556	0.5	10	1.93	24	12.965	TW-12 (11/2/2005)	280	0		7
µg/L	1	1				5	5								
µg/L	1	1				5	5								
µg/L	1	1				5	5								
µg/L	16	5				1	10								
µg/L	14	7				0.5	5								
µg/L	1	1				5	5								
µg/L	1	1				5	5								
µg/L	16	5	6	3	0.375	1	5.62	1.14	63.6	19.145	TW-11 (4/16/2008)	300	0		600
µg/L	36	12	6	2	0.166666667	0.5	10	6.26	17.3	10.92	TW-01 (12/12/2013)	0.17	6	101.8	5
µg/L	5	3	4	2	0.8	1	1	1.43	96.8	50.7325	TW-02 (2/24/2005)		0		
µg/L	36	12	2	2	0.055555556	0.5	10	1.37	2.83	2.1	TW-01 (12/12/2013)	0.44	2	6.4	5
µg/L	14	7				0.5	5								
µg/L	29	10	5	3	0.172413793	0.5	5.62	1.23	44.9	19.582	TW-71A (11/18/2014)		0		
µg/L	1	1				5	5								
µg/L	34	11	8	3	0.235294118	0.5	5.62	3.31	238	116.30375	TW-11 (4/16/2008)	0.48	8	495.8	75
µg/L	22	9	12	5	0.545454545	0.2	100	0.59	169	31.56166667	TW-02 (10/30/2004)	0.46	12	367.4	
µg/L	1	1				5	5								
µg/L	4	2				5.32	28.1								
µg/L	4	2				5.32	6.1								
µg/L	4	2				5.32	6.1								
µg/L	4	2				5.32	6.1								
µg/L	4	2				26.6	30.5								
µg/L	4	2				5.32	6.1								
µg/L	4	2				5.32	6.1								
µg/L	36	12				5	100								
µg/L	1	1				10	10								
µg/L	4	2				5.32	6.1								
µg/L	4	2	1	1	0.25	5.32	5.62	9.65	9.65	9.65	TW-11 (4/16/2008)	91	0		
µg/L	1	1				5	5								
µg/L	31	12				5	50								
µg/L	13	6	1	1	0.076923077	0.5	5.62	6.77	6.77	6.77	TW-11 (4/16/2008)	36	0		
µg/L	4	2				5.32	6.1								
µg/L	4	2				26.6	30.5								
µg/L	4	2				5.32	6.1								
µg/L	4	2				6.1	26.6								
µg/L	4	2				5.32	12.2								
µg/L	4	2				26.6	30.5								
µg/L	4	2				26.6	30.5								
µg/L	4	2				5.32	6.1								
µg/L	4	2				5.32	6.1								
µg/L	4	2				5.32	24.4								
µg/L	4	2				5.32	6.1								

No. of Exceedances	Ratio of Max. Exceedance / MCL	VISL	No. of Exceedances	Ratio of Max. Exceedance / VISL
1	1.1	36	0	
0		430	0	
1	3.4	1000	0	
0		17000	0	
6	3.5	130	0	
0			0	
0		140	0	
0			0	
5	3.2	170	3	1.4
0		180000	0	
0			0	
0			0	

4-Chlorotoluene
4-Methyl-2-pentanone
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Acetone
Acrylonitrile
Anthracene
Antimony
Antimony, dissolved
Arsenic
Arsenic, dissolved
Barium
Barium, dissolved
Benzene
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (g,h,i) perylene
Benzo(k)fluoranthene
Beryllium
Beryllium, dissolved
Bis (2-chloroethoxy) methane
Bis (2-chloroethyl) ether
Bis (2-chloroisopropyl) ether
Bis (2-ethylhexyl) phthalate
Bromodichloromethane
Bromoform
Bromomethane
Butyl benzylphthalate
Cadmium
Cadmium, dissolved
Carbazole
Carbon disulfide
Carbon tetrachloride
Chloride
Chlorobenzene
Chlorobromomethane
Chloroethane
Chloroform
Chloromethane
Chromium
Chromium, dissolved
Chrysene
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Copper
Copper, dissolved
Dibenzo (a,h) anthracene
Dibenzofuran
Dibromochloromethane
Dichlorodifluoromethane
Diethyl phthalate
Dimethyl phthalate

µg/L	1	1				5	5								
µg/L	36	12				5	50								
µg/L	4	2				26.6	30.5								
µg/L	4	2				26.6	30.5								
µg/L	4	2	1	1	0.25	5.32	5.62	0.16	0.16	0.16	TW-11 (4/16/2008)	530	0		
µg/L	4	2				0.054	5.62								
µg/L	36	12	5	5	0.138888889	5	250	5.69	35.4	12.672	TW-12 (11/2/2005)	14000	0		
µg/L	17	7				5	100								
µg/L	4	2				0.054	5.62								
mg/L	2	1	1	1	0.5	0.001	0.001	0.0127	0.0127	0.0127	TW-02 (10/30/2004)	0.0078	1	1.6	0.006
mg/L	1	1	1	1	1			0.00449	0.00449	0.00449	TW-02 (10/30/2004)	0.0078	0		0.006
mg/L	7	3	3	2	0.428571429	0.004	0.01	0.00165	0.077	0.030716667	TW-02 (10/30/2004)	0.000052	3	1480.8	0.01
mg/L	9	3	2	1	0.222222222	0.001	0.01	0.0113	0.0118	0.01155	TW-01 (9/25/2014)	0.000052	2	226.9	0.01
mg/L	2	1	2	1	1			0.1	0.324	0.212	TW-02 (6/7/2005)	3.8	0		2
mg/L	1	1	1	1	1			0.157	0.157	0.157	TW-02 (2/24/2005)	3.8	0		2
µg/L	36	12	11	6	0.305555556	0.5	5	1.26	105	27.40181818	TW-11 (4/16/2008)	0.46	11	228.3	5
µg/L	4	2				0.054	5.62								
µg/L	4	2				0.054	5.62								
µg/L	13	6				0.054	5.62								
µg/L	4	2				0.054	5.62								
µg/L	4	2				0.054	5.62								
mg/L	2	1				0.01	0.01								
mg/L	1	1				0.01	0.01								
µg/L	4	2				5.32	6.1								
µg/L	13	6				0.05	6.1								
µg/L	13	6				1	6.1								
µg/L	13	6	1	1	0.076923077	5	6.1	22	22	22	TW-104 (6/25/2015)	5.6	1	3.9	6
µg/L	36	12				0.5	10								
µg/L	18	7				1	10								
µg/L	36	12				0.5	10								
µg/L	4	2				5.32	6.1								
mg/L	7	3				0.001	0.01								
mg/L	8	3				0.001	0.01								
µg/L	4	2				5.32	24.4								
µg/L	36	12	1	1	0.027777778	1	5	17.4	17.4	17.4	TW-11 (4/16/2008)	810	0		
µg/L	36	12				0.5	10								
mg/L	3	2	3	2	1			35.5	70.7	58.46666667	TW-02 (10/30/2004)		0		
µg/L	36	12	19	8	0.527777778	0.5	5	1.69	2730	330.3021053	TW-12 (11/2/2005)	78	8	35.0	100
µg/L	1	1				5	5								
µg/L	18	7				1	10								
µg/L	36	12	6	3	0.166666667	0.5	10	1.6	4180	773.1566667	MW-NCF1 (11/19/2011)	0.22	6	19000.0	80
µg/L	36	12				0.5	10								
mg/L	7	3	1	1	0.142857143	0.005	0.02	0.223	0.223	0.223	TW-02 (10/30/2004)		0		0.1
mg/L	9	3				0.005	0.02								
µg/L	4	2				0.054	5.62								
µg/L	31	11	10	4	0.322580645	0.5	10	1.42	168	44.542	TW-01 (12/12/2013)	36	4	4.7	70
µg/L	18	7				1	10								
mg/L	2	1	1	1	0.5	0.02	0.02	0.162	0.162	0.162	TW-02 (10/30/2004)	0.8	0		1.3
mg/L	1	1				0.02	0.02								
µg/L	4	2				0.054	5.62								
µg/L	4	2				5.32	6.1								
µg/L	36	12				0.5	10								
µg/L	23	9	5	3	0.217391304	0.5	10	1	22	5.284	TW-104 (6/25/2015)	200	0		
µg/L	4	2				5.32	6.1								
µg/L	4	2				5.32	6.1								

0			0	
0		120000000	0	
1	2.1		0	
0			0	
2	7.7		0	
2	1.2		0	
0			0	
0			0	
6	21.0	92	1	1.1
1	3.7		0	
0		6600	0	
0			0	
6	27.3	2400	1	1.1
3	52.3	46	3	90.9
1	2.2		0	
3	2.4		0	
0			0	
0		41	0	

Di-n-butylphthalate
Di-n-octylphthalate
Dissolved Organic Carbon
Ethane
Ethyl ether
Ethylbenzene
Ethylene
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3-c,d) pyrene
Iron
Iron, dissolved
Iron, Ferrous
Isophorone
Isopropylbenzene
Lead
Lead, dissolved
m,p-Xylene
Manganese, dissolved
Mercury
Mercury, dissolved
Methane
Methylene bromide
Methylene chloride
Monobromobenzene
Naphthalene
n-Butylbenzene
Nickel
Nickel, dissolved
Nitrate Nitrogen
Nitrite Nitrogen
Nitrobenzene
n-Nitrosodi-n-propylamine
n-Nitrosodiphenylamine
n-Propylbenzene
o-Xylene
Pentachlorophenol
Phenanthrene
Phenol
Phenolics, Total Recoverable
p-Isopropyltoluene
Pyrene
sec-Butylbenzene
Selenium
Selenium, dissolved
Silver
Silver, dissolved
Styrene
Sulfate (AS SO4)
tert-Butyl Methyl Ether
tert-Butylbenzene

µg/L	4	2				5.32	6.1								
µg/L	4	2				5.32	6.1								
mg/L	1	1	1	1	1			16.3	16.3	16.3	TW-11 (4/16/2008)		0		
µg/L	1	1	1	1	1			1.73	1.73	1.73	TW-11 (4/16/2008)		0		
µg/L	13	6	2	2	0.153846154	0.5	50	0.9	2	1.45	TW-104 (6/25/2015)	3900	0		
µg/L	36	12	4	2	0.111111111	0.5	5	1.37	29.5	8.6125	TW-11 (4/16/2008)	1.5	3	19.7	700
µg/L	1	1				0.5	0.5								
µg/L	4	2				0.054	5.62								
µg/L	4	2	1	1	0.25	5.32	5.62	0.14	0.14	0.14	TW-11 (4/16/2008)	290	0		
µg/L	4	2				5.32	6.1								
µg/L	5	2				5	6.1								
µg/L	4	2				5.32	26.6								
µg/L	13	6				5	6.1								
µg/L	4	2				0.054	5.62								
mg/L	1	1	1	1	1			65.5	65.5	65.5	TW-11 (4/16/2008)	14	1	4.7	
mg/L	1	1	1	1	1			61.3	61.3	61.3	TW-11 (4/16/2008)	14	1	4.4	
mg/L	1	1	1	1	1			58.1	58.1	58.1	TW-11 (4/16/2008)		0		
µg/L	13	6				1	6.1								
µg/L	1	1				5	5								
mg/L	3	1	2	1	0.666666667	0.005	0.005	0.0149	0.212	0.11345	TW-02 (10/30/2004)		0		0.015
mg/L	2	1				0.001	0.005								
µg/L	1	1				5	5								
mg/L	1	1	1	1	1			4.56	4.56	4.56	TW-11 (4/16/2008)	0.43	1	10.6	
mg/L	3	1				0.0002	0.0002								
mg/L	2	1				0.0002	0.0002								
µg/L	1	1	1	1	1			4800	4800	4800	TW-11 (4/16/2008)		0		
µg/L	1	1				5	5								
µg/L	36	12	3	1	0.083333333	0.5	50	1.56	15.6	7.496666667	TW-71B (10/22/2012)	11	1	1.4	5
µg/L	1	1				5	5								
µg/L	28	10	1	1	0.035714286	0.5	10	300	300	300	TW-11 (4/16/2008)	0.17	1	1764.7	
µg/L	1	1				5	5								
mg/L	2	1	1	1	0.5	0.04	0.04	0.196	0.196	0.196	TW-02 (10/30/2004)	0.39	0		
mg/L	1	1				0.04	0.04								
mg/L	2	2				0.05	0.6								
mg/L	1	1				0.4	0.4								
µg/L	4	2				5.32	6.1								
µg/L	4	2				5.32	6.1								
µg/L	4	2				5.32	6.1								
µg/L	1	1				5	5								
µg/L	1	1				5	5								
µg/L	4	2				26.6	30.5								
µg/L	4	2	1	1	0.25	5.32	5.62	0.056	0.056	0.056	TW-11 (4/16/2008)		0		
µg/L	11	5	1	1	0.090909091	1	5.62	71.7	71.7	71.7	TW-11 (4/16/2008)	5800	0		
µg/L	1	1				5.56	5.56								
µg/L	1	1				5	5								
µg/L	4	2				0.054	5.62								
µg/L	1	1				5	5								
mg/L	3	1	2	1	0.666666667	0.01	0.01	0.00356	0.00447	0.004015	TW-02 (10/30/2004)	0.1	0		0.05
mg/L	1	1	1	1	1			0.00197	0.00197	0.00197	TW-02 (10/30/2004)	0.1	0		0.05
mg/L	3	1				0.01	0.02								
mg/L	1	1				0.01	0.01								
µg/L	36	12				0.5	10								
mg/L	2	2	1	1	0.5	1	1	45.6	45.6	45.6	TW-02 (6/7/2005)		0		
µg/L	12	4				1	50								
µg/L	1	1				5	5								

0			0	
0			0	
0			0	
0		220	0	
0			0	
0			0	
0			0	
0			0	
1	14.1		0	
0			0	
0			0	
2	3.1	25000	0	
0		310	0	
0			0	
0			0	
0			0	
0			0	
0			0	
0			0	

Tetrachloroethene
Thallium
Thallium, dissolved
Toluene
Total Alkalinity as CaCO3
Total Organic Carbon
Trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethylene
Trichlorofluoromethane
Vinyl acetate
Vinyl chloride
VOCs, Total
Xylenes, Total
Zinc
Zinc, dissolved

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater tempera

µg/L	36	12	1	1	0.027777778	0.5	10	1.36	1.36	1.36	TW-71A (10/18/2012)	11	0		5
mg/L	2	1	1	1	0.5	0.0005	0.0005	0.00155	0.00155	0.00155	TW-02 (10/30/2004)	0.0002	1	7.8	0.002
mg/L	1	1	1	1	1			0.000666	0.000666	0.000666	TW-02 (10/30/2004)	0.0002	1	3.3	0.002
µg/L	36	12	4	2	0.111111111	0.5	10	1.96	3.05	2.3525	TW-12 (11/2/2005)	1100	0		1000
mg/L	1	1	1	1	1			181	181	181	TW-11 (4/16/2008)		0		
mg/L	4	3	4	3	1			2.64	26.5	12.7875	TW-12 (11/2/2005)		0		
µg/L	31	11	4	2	0.129032258	0.5	10	1.14	2.07	1.6525	TW-07 (3/12/2010)	360	0		100
µg/L	18	7				1	10								
µg/L	36	12	9	3	0.25	0.5	10	2.01	361	199.4122222	TW-01 (12/12/2013)	0.49	9	736.7	5
µg/L	23	9	8	3	0.347826087	0.5	10	1	14.1	4.59625	TW-07 (9/17/2010)	5200	0		
µg/L	18	7				5	100								
µg/L	36	12	13	5	0.361111111	0.5	10	1.25	26.2	9.063076923	TW-01 (12/12/2013)	0.019	13	1378.9	2
µg/L	36	12	34	12	0.944444444	0	0	0.59	6798.73	602.5091176	TW-11 (4/16/2008)		0		
µg/L	35	12	1	1	0.028571429	0.5	50	1.12	1.12	1.12	TW-12 (11/2/2005)	190	0		10000
mg/L	2	1	1	1	0.5	0.02	0.02	0.541	0.541	0.541	TW-02 (10/30/2004)	6	0		
mg/L	1	1				0.02	0.02								

ɜture equal to 19 degrees Celsius

0		340	0	
0			0	
0			0	
0		110000	0	
0			0	
0			0	
0			0	
8	72.2	29	8	12.4
0			0	
9	13.1	29	0	
0			0	
0		2300	0	
0			0	

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

Appendix B; Table B-8 - Exposure Unit 8
Corrective Measures Proposal
Union Carbide Corporation Institute Facility,
Institute, West Virginia

Analyte Name
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloroethene
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,4-Dioxane (p-Dioxane)
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Butanone
2-Chloronaphthalene
2-Chlorophenol
2-Hexanone
2-Methylnaphthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3,3'-Dichlorobenzidine
3-Methylphenol & 4-Methylphenol
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl ether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether
4-Methyl-2-pentanone
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Acetone
Acrylonitrile
Anthracene
Arsenic, dissolved
Barium, dissolved

Result Units	No. of Samples	No. of Locations	Detect Sample Count	Detect Location Count	Frequency of Detection	Minimum Non-Detect Result	Maximum Non-Detect Result	Minimum Detect Result	Maximum Detect Result	Average Detected Result	Location (Date) of Max. Detect	Tap Water RSL	No. of Exceedances	Ratio of Max. Exceedance / RSL	MCL	No. of Exceedances
µg/L	12	4				1	500									
µg/L	33	9				1	500									
µg/L	33	9				1	500									
µg/L	33	9	16	4	0.484848485	1	500	1.12	7.05	3.525625	TW-65A (10/12/2012)	2.8	8	2.5		0
µg/L	33	9	8	2	0.242424242	1	500	1.25	2.97	2.20125	TW-23 (9/16/2010)	280	0		7	0
µg/L	12	4				1	61									
µg/L	11	5				1	5									
µg/L	12	4				1	61									
µg/L	33	9				1	500									
µg/L	3	2				5	500									
µg/L	33	9				1	500									
µg/L	11	5				1	5									
µg/L	23	9				1	61									
µg/L	33	9				1	100									
µg/L	15	5	8	3	0.533333333	2	10000	2.17	19.5	8.68	TW-65B (10/20/2015)	0.46	8	42.4		0
µg/L	3	2				5.95	61									
µg/L	3	2				5.26	61									
µg/L	3	2				5.26	61									
µg/L	3	2				5.26	61									
µg/L	3	2				26.3	305									
µg/L	6	3				5.26	61									
µg/L	6	3				5.26	61									
µg/L	33	9				5	1000									
µg/L	6	3				5.26	61									
µg/L	3	2				5.26	61									
µg/L	23	9				5	1000									
µg/L	16	5				0.51	61									
µg/L	3	2				5.26	61									
µg/L	6	3				26.3	305									
µg/L	3	2				5.26	61									
µg/L	5	3				5.26	305									
µg/L	3	2				5.26	61									
µg/L	6	3				26.3	305									
µg/L	3	2				26.3	305									
µg/L	6	3				5.26	61									
µg/L	3	2				5.26	61									
µg/L	6	3				5.26	61									
µg/L	6	3				5.26	61									
µg/L	33	9	7	2	0.212121212	5	25	56.6	27400	14913.8	TW-27R (6/2/2009)	6300	6	4.3		0
µg/L	6	3				26.3	305									
µg/L	3	2				26.3	305									
µg/L	6	3	1	1	0.166666667	0.54	61	0.35	0.35	0.35	TW-22 (2/7/2008)	530	0			0
µg/L	6	3				0.055	61									
µg/L	33	9	11	4	0.333333333	5	250	34.8	74200	15972.28182	TW-27 (3/10/2005)	14000	4	5.3		0
µg/L	12	4				10	10000									
µg/L	12	4	1	1	0.083333333	0.055	61	0.16	0.16	0.16	TW-27 (2/12/2008)	1800	0			0
mg/L	1	1	1	1	1			0.00612	0.00612	0.00612	TW-64 (10/11/2012)	0.000052	1	117.7	0.01	0
mg/L	1	1	1	1	1			0.141	0.141	0.141	TW-64 (10/11/2012)	3.8	0		2	0

Ratio of Max. Exceedance / MCL	VISL	No. of Exceedances	Ratio of Max. Exceedance / VISL
	430	0	
	1000	0	
	180000	0	
	3300000	0	
		0	
	120000000	0	
		0	
		0	
		0	

Benzene
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (g,h,i) perylene
Benzo(k)fluoranthene
Bis (2-chloroethoxy) methane
Bis (2-chloroethyl) ether
Bis (2-chloroisopropyl) ether
Bis (2-ethylhexyl) phthalate
Bis (2-ethylhexyl) phthalate, dissolved
Bromodichloromethane
Bromoform
Bromomethane
Butyl benzylphthalate
Cadmium, dissolved
Carbazole
Carbon Dioxide
Carbon disulfide
Carbon tetrachloride
Chloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane
Chromium, dissolved
Chrysene
cis-1,2-Dichloroethylene
cis-1,3-Dichloropropene
Dibenzo (a,h) anthracene
Dibenzofuran
Dibromochloromethane
Dichlorodifluoromethane
Diethyl phthalate
Dimethyl phthalate
Di-n-butylphthalate
Di-n-octylphthalate
Dissolved Organic Carbon
Ethane
Ethyl ether
Ethylbenzene
Ethylene
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3-c,d) pyrene
Iron
Iron, dissolved
Iron, Ferrous
Isophorone
Lead, dissolved
Manganese, dissolved

µg/L	33	9	1	1	0.03030303	1	500	2.68	2.68	2.68	TW-23 (12/10/2010)	0.46	1	5.8	5	0
µg/L	12	4	1	1	0.083333333	0.055	61	0.43	0.43	0.43	TW-27 (2/12/2008)	0.012	1	35.8		0
µg/L	12	4	1	1	0.083333333	0.055	61	0.41	0.41	0.41	TW-27 (2/12/2008)	0.0034	1	120.6	0.2	1
µg/L	16	5	1	1	0.0625	0.055	61	0.76	0.76	0.76	TW-27 (2/12/2008)	0.034	1	22.4		0
µg/L	6	3	1	1	0.166666667	0.055	61	0.28	0.28	0.28	TW-27 (2/12/2008)		0			0
µg/L	12	4	1	1	0.083333333	0.055	61	0.35	0.35	0.35	TW-27 (2/12/2008)	0.34	1	1.0		0
µg/L	6	3				5.26	61									
µg/L	16	5				0.51	61									
µg/L	16	5				0.51	61									
µg/L	16	5	6	3	0.375	5.1	602	13.6	571	165.5166667	TW-27R (6/2/2009)	5.6	6	102.0	6	6
µg/L	1	1				6.1	6.1									
µg/L	33	9				1	500									
µg/L	12	4				1	500									
µg/L	33	9				1	1000									
µg/L	6	3				5.26	61									
mg/L	1	1				0.0005	0.0005									
µg/L	6	3				5.26	122									
µg/L	1	1	1	1	1			130000	130000	130000	TW-27 (10/18/2006)		0			0
µg/L	33	9				1	500									
µg/L	33	9	1	1	0.03030303	1	500	1.16	1.16	1.16	TW-61 (10/21/2015)	0.46	1	2.5	5	0
mg/L	4	3	4	3	1			73.2	3670	1012.8	TW-27 (2/12/2008)		0			0
µg/L	33	9	3	1	0.090909091	1	500	1.45	1.64	1.573333333	TW-26 (10/23/2013)	78	0		100	0
µg/L	12	4				1	1000									
µg/L	33	9	4	1	0.121212121	1	500	14.6	19.6	17.5	TW-61 (10/29/2013)	0.22	4	89.1	80	0
µg/L	33	9				1	1000									
mg/L	1	1				0.005	0.005									
µg/L	6	3	1	1	0.166666667	0.055	61	0.62	0.62	0.62	TW-27 (2/12/2008)	3.4	0			0
µg/L	30	9				1	100									
µg/L	12	4				1	500									
µg/L	6	3				0.055	61									
µg/L	6	3				5.26	61									
µg/L	33	9				1	500									
µg/L	27	7	8	3	0.296296296	1	100	1	95.4	55.225	TW-61 (11/13/2014)	200	0			0
µg/L	6	3				5.26	61									
µg/L	6	3				5.26	61									
µg/L	12	4	3	2	0.25	0.51	61	0.562	69.1	32.654	TW-27R (4/15/2008)	900	0			0
µg/L	6	3	1	1	0.166666667	5.26	61	6.43	6.43	6.43	TW-22 (12/8/2004)	200	0			0
mg/L	4	3	4	3	1			4.7	1010	380.325	TW-27 (10/18/2006)		0			0
µg/L	4	3	1	1	0.25	0.5	25	17.7	17.7	17.7	TW-27R (4/15/2008)		0			0
µg/L	11	5	2	1	0.181818182	10	10	1060	1200	1130	TW-64 (2/16/2016)	3900	0			0
µg/L	33	9	5	2	0.151515152	1	500	1.93	5.06	3.092	TW-26 (10/11/2012)	1.5	5	3.4	700	0
µg/L	4	3	1	1	0.25	0.5	25	0.694	0.694	0.694	TW-27R (4/15/2008)		0			0
µg/L	12	4	1	1	0.083333333	0.055	61	1.2	1.2	1.2	TW-27 (2/12/2008)	800	0			0
µg/L	6	3	1	1	0.166666667	0.54	61	0.14	0.14	0.14	TW-22 (2/7/2008)	290	0			0
µg/L	6	3				5.26	61									
µg/L	6	3				5.26	61									
µg/L	6	3				5.26	305									
µg/L	10	4				0.515	61									
µg/L	12	4	1	1	0.083333333	0.055	61	0.24	0.24	0.24	TW-27 (2/12/2008)	0.034	1	7.1		0
mg/L	4	3	4	3	1			35.3	74.3	56.175	TW-27 (10/18/2006)	14	4	5.3		0
mg/L	4	4	4	4	1			15.6	42.2	24.15	TW-27 (2/12/2008)	14	4	3.0		0
mg/L	4	3	4	3	1			19.1	84.3	38.55	TW-27 (10/18/2006)		0			0
µg/L	16	5	7	2	0.4375	0.51	5.95	596	32800	7810.857143	TW-27R (4/15/2008)	78	7	420.5		0
mg/L	1	1				0.001	0.001									
mg/L	4	4	4	4	1			0.582	11.8	5.723	TW-27R (4/15/2008)	0.43	4	27.4		0

	92	0	
		0	
2.1		0	
		0	
		0	
		0	
95.2		0	
		0	
	24	0	
		0	
	2400	0	
	46	0	
		0	
	41	4	2.3
		0	
		0	
		0	
		0	
		0	
	220	0	
		0	
		0	
		0	
		0	
		0	
		0	
		0	
		0	
		0	

Mercury, dissolved
Methane
Methylene chloride
Naphthalene
Nitrate Nitrogen
Nitrite Nitrogen
Nitrobenzene
n-Nitrosodi-n-propylamine
n-Nitrosodiphenylamine
Pentachlorophenol
Phenanthrene
Phenol
Pyrene
Silver, dissolved
Styrene
Sulfate (AS SO4)
tert-Butyl Methyl Ether
Tetrachloroethene
Toluene
Total Alkalinity as CaCO3
Trans-1,2-Dichloroethylene
trans-1,3-Dichloropropene
Trichloroethylene
Trichlorofluoromethane
Vinyl acetate
Vinyl chloride
VOCs, Total
Xylenes, Total

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperi

mg/L	1	1				0.0002	0.0002									
µg/L	4	3	4	3	1			2070	8710	4175	TW-27 (2/12/2008)		0			0
µg/L	33	9				1	500									
µg/L	33	9	5	3	0.151515152	0.51	61	0.27	3.6	2.206	TW-22 (2/7/2008)	0.17	5	21.2		0
mg/L	4	3				0.6	6									
mg/L	3	3				0.4	4									
µg/L	6	3				5.26	61									
µg/L	6	3				5.26	61									
µg/L	6	3				5.26	61									
µg/L	3	2				26.3	305									
µg/L	12	4	1	1	0.083333333	0.055	61	0.92	0.92	0.92	TW-27 (2/12/2008)		0			0
µg/L	13	5				0.51	61									
µg/L	12	4	1	1	0.083333333	0.055	61	0.92	0.92	0.92	TW-27 (2/12/2008)	120	0			0
mg/L	1	1				0.01	0.01									
µg/L	33	9				1	500									
mg/L	4	3	3	2	0.75	1	1	1.55	28.3	13.58333333	TW-27 (2/12/2008)		0			0
µg/L	9	4				5	250									
µg/L	33	9	4	1	0.121212121	1	500	2.12	2.52	2.3825	TW-23 (6/16/2010)	11	0		5	0
µg/L	33	9	1	1	0.03030303	1	500	2.62	2.62	2.62	TW-23 (12/10/2010)	1100	0		1000	0
mg/L	4	3	4	3	1			233	379	298	TW-27R (4/15/2008)		0			0
µg/L	30	9				1	100									
µg/L	12	4				1	500									
µg/L	33	9				1	500									
µg/L	27	7	8	3	0.296296296	1	100	1	105	56.5125	TW-61 (11/13/2014)	5200	0			0
µg/L	12	4				10	1000									
µg/L	33	9	4	1	0.121212121	1	1000	9.52	14.2	12.08	TW-64 (10/25/2013)	0.019	4	747.4	2	4
µg/L	34	9	33	9	0.970588235	0	0	3.38	99300	9023.634667	TW-27 (3/10/2005)		0			0
µg/L	33	9				1	500									

ɜture equal to 19 degrees Celsius

		0	
	310	0	
		0	
		0	
		0	
	340	0	
	110000	0	
		0	
		0	
7.1	29	0	
		0	

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

Appendix B; Table B-9 - Appalachian Power Company (APCO)

Corrective Measures Proposal
Union Carbide Corporation Institute Facility,
Institute, West Virginia

Analyte Name
1,4-Dioxane (p-Dioxane)
VOCs, Total

Notes
µg/L = micrograms per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater tempera

Result Units	No. of Samples	No. of Locations	Detect Sample Count	Detect Location Count	Frequency of Detection	Minimum Non-Detect Result	Maximum Non-Detect Result	Minimum Detect Result	Maximum Detect Result	Average Detected Result	Location (Date) of Max. Detect	Tap Water RSL	No. of Exceedances	Ratio of Max. Exceedance / RSL	MCL
µg/L	9	4	4	4	0.444444444	1.02	1.39	2.31	7.2	4.8425	AEP-0004 (10/27/2010)	0.46	4	15.7	
µg/L	9	4	4	4	0.444444444	0	0	2.31	7.2	4.8425	AEP-0004 (10/27/2010)		0		

ɜture equal to 19 degrees Celsius

No. of Exceedances	Ratio of Max. Exceedance / MCL	VISL	No. of Exceedances	Ratio of Max. Exceedance / VISL
0		180000	0	
0			0	

Notes
µg/L = micrograms per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

Appendix B; Table B-10 - West Virginia State University (WVSU)

Corrective Measures Proposal
Union Carbide Corporation Institute Facility,
Institute, West Virginia

Analyte Name
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,2,4-Trimethylbenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,4-Dioxane (p-Dioxane)
2-Butanone
2-Hexanone
4-Methyl-2-pentanone
Acetone
Benzene
Bromodichloromethane
Bromomethane
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroform
Chloromethane
cis-1,2-Dichloroethylene
Dibromochloromethane
Dichlorodifluoromethane
Ethyl ether
Ethylbenzene
Isophorone
Methylene chloride
Naphthalene
Styrene
Tetrachloroethene

Result Units	No. of Samples	No. of Locations	Detect Sample Count	Detect Location Count	Frequency of Detection	Minimum Non-Detect Result	Maximum Non-Detect Result
µg/L	2	2				0.5	0.5
µg/L	2	2				0.5	0.5
µg/L	25	12	10	6	0.4	0.5	1
µg/L	25	12	5	3	0.2	0.5	1
µg/L	2	2				0.5	0.5
µg/L	25	12				0.5	1
µg/L	2	2				0.5	0.5
µg/L	2	2				0.5	0.5
µg/L	2	2				0.5	0.5
µg/L	2	2				0.5	0.5
µg/L	23	13	17	11	0.739130435	0.2	1.1
µg/L	2	2				5	5
µg/L	2	2				5	5
µg/L	2	2				5	5
µg/L	25	12	2	2	0.08	5	5
µg/L	25	12	3	2	0.12	0.5	1
µg/L	2	2				0.5	0.5
µg/L	2	2				0.5	0.5
µg/L	2	2				1	1
µg/L	2	2				0.5	0.5
µg/L	25	12	4	2	0.16	0.5	1
µg/L	25	12	11	8	0.44	0.5	1
µg/L	2	2				0.5	0.5
µg/L	2	2				0.5	0.5
µg/L	2	2				0.5	0.5
µg/L	25	12	6	4	0.24	0.5	1
µg/L	2	2				0.5	0.5
µg/L	25	12				0.5	1
µg/L	21	12				1	5.56
µg/L	2	2				0.5	0.5
µg/L	21	12				0.5	5.56
µg/L	2	2				0.5	0.5
µg/L	25	12				0.5	1

Minimum Detect Result	Maximum Detect Result	Average Detected Result	Location (Date) of Max. Detect	Tap Water RSL	No. of Exceedances	Ratio of Max. Exceedance / RSL
0.6	12.3	3.802	INS-0389 (3/13/2013)	2.8	4	4.4
1.03	5	2.006	TW-110 (7/31/2015)	280	0	
1.7	36.7	9.306470588	INS-0390 (3/12/2013)	0.46	17	79.8
39	44	41.5	TW-108 (7/31/2015)	14000	0	
1.67	5.3	2.91	INS-0388 (3/14/2013)	0.46	3	11.5
37.7	205	118.125	INS-0388 (5/17/2013)	78	2	2.6
0.5	29.9	9.984545455	INS-0388 (3/14/2013)	0.22	11	135.9
0.6	57.2	22.7	INS-0389 (3/13/2013)	200	0	

MCL	No. of Exceedances	Ratio of Max. Exceedance / MCL	VISL	No. of Exceedances	Ratio of Max. Exceedance / VISL
	0		430	0	
7	0		1000	0	
	0		180000	0	
	0		120000000	0	
5	1	1.1	92	0	
100	2	2.1	2400	0	
80	0		46	0	
	0		41	2	1.4

Toluene
Trans-1,2-Dichloroethylene
Trichloroethylene
Trichlorofluoromethane
Vinyl chloride
VOCs, Total
Xylenes, Total

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk e

µg/L	25	12				0.5	1
µg/L	2	2				0.5	0.5
µg/L	2	2				0.5	0.5
µg/L	25	12	9	5	0.36	0.5	1
µg/L	2	2				0.5	0.5
µg/L	27	13	22	13	0.814814815	0	0
µg/L	2	2				0.5	0.5

qual to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius

2	141	31.57111111	INS-0389 (5/16/2013)	5200	0	
2.3	220.81	59.12090909	INS-0389 (5/16/2013)		0	

	0			0	
	0			0	

Notes
µg/L = micrograms per liter
mg/L = milligrams per liter
RSL = USEPA Regional Screening Levels (November, 2015; https://www.epa.gov/risk/regional-screening-levels-rsls)
MCL = Maximum Contaminant Level
VISL = USEPA Vapor Intrusion Screening Level (November 2015; http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6) based on a commercial/industrial exposure scenario, a target cancer risk equal to 1E-05, a non-cancer hazard quotient equal to 1, and a site-specific, average groundwater temperature equal to 19 degrees Celsius