Appendix E
Table 1
VOA Soil/Sediment Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/kg)	Project Quantitation Limit (ug/kg)	Analytical Method		Achievable Laboratory Limits		PAL References
				MDLs	Method QLs	MDLs	QLs	
Dichlorodifluoromethane	75-71-8	94,000	5	NA	NA	5	25	USEPA, 2013
Chloromethane	74-87-3	120,000	5	NA	NA	5	25	USEPA, 2013
Vinyl chloride	75-01-4	6	1	NA	NA	1	5	NYSDEC, 1999 (EqP)
Bromomethane	74-83-9	12	2	NA	NA	2	10	USEPA Region 5, 2003 (EqP)
Chloroethane	75-00-3	15,000,000	5	NA	NA	5	25	USEPA, 2013
Trichlorofluoromethane	75-69-4	790,000	5	NA	NA	5	25	USEPA, 2013
1,1-Dichloroethene	75-35-4	2	0.5	NA	NA	0.5	2	NYSDEC, 1999 (EqP)
Acetone	67-64-1	1,737	5	NA	NA	5	25	USEPA Region 6, 1999 (EqP)
Carbon disulfide	75-15-0	208	5	NA	NA	5	25	USEPA Region 5, 2003 (EqP)
Methylene chloride	75-09-2	1,383	5	NA	NA	5	25	USEPA Region 5, 2003 (EqP)
trans-1,2-Dichloroethene	156-60-5	5,690	5	NA	NA	5	25	USEPA Region 5, 2003 (EqP)
Methyl tert-butyl ether	1634-04-4	43,000	5	NA	NA	5	25	USEPA, 2013
1,1-Dichloroethane	75-34-3	5	1	NA	NA	1	5	USEPA Region 5, 2003 (EqP)
cis-1,2-Dichloroethene	156-59-2	160,000	5	NA	NA	5	25	USEPA, 2013
2-Butanone	78-93-3	369	5	NA	NA	5	25	USEPA Region 5, 2003 (EqP)
Chloroform	67-66-3	290	5	NA	NA	5	25	USEPA, 2013
1,1,1-Trichloroethane	71-55-6	7,447	5	NA	NA	5	25	USEPA Region 3, 2006 (EqP)
Carbon tetrachloride	56-23-5	52	5	NA	NA	5	25	NYSDEC, 1999 (EqP)
Benzene	71-43-2	52	5	NA	NA	5	25	NYSDEC, 1999 (EqP)
1,2-Dichloroethane	107-06-2	61	5	NA	NA	5	25	NYSDEC, 1999 (EqP)
Trichloroethene	79-01-6	174	5	NA	NA	5	25	NYSDEC, 1999 (EqP)
1,2-Dichloropropane	78-87-5	940	5	NA	NA	5	25	USEPA, 2013
Bromodichloromethane	75-27-4	270	5	NA	NA	5	25	USEPA, 2013
cis-1,3-Dichloropropene	10061-01-5	1,700	5	NA	NA	5	25	USEPA, 2011
4-Methyl-2-pentanone	108-10-1	218	5	NA	NA	5	25	USEPA Region 5, 2003 (EqP)
Toluene	108-88-3	450	5	NA	NA	5	25	USEPA Region 2, 2010
trans-1,3-Dichloropropene	10061-02-6	1,700	5	NA	NA	5	25	USEPA, 2011
1,1,2-Trichloroethane	79-00-5	52	5	NA	NA	5	25	NYSDEC, 1999 (EqP)
Tetrachloroethene	127-18-4	70	5	NA	NA	5	25	NYSDEC, 1999 (EqP)
2-Hexanone	591-78-6	506	5	NA	NA	5	25	USEPA Region 5, 2003 (EqP)
Chlorodibromomethane	124-48-1	680	5	NA	NA	5	25	USEPA, 2013
1,2-Dibromoethane	106-93-4	34	5	NA	NA	5	25	USEPA, 2013
Chlorobenzene	108-90-7	35	5	NA	NA	5	25	USEPA Region 2, 2010
Ethylbenzene	100-41-4	64	5	NA	NA	5	25	USEPA Region 2, 2010
Xylene (total)	1330-20-7	270	5	NA	NA	5	25	USEPA Region 2, 2010
Styrene	100-42-5	61,509	5	NA	NA	5	25	USEPA Region 3, 2006 (EqP)
Bromoform	75-25-2	11,397	10	NA	NA	10	50	USEPA Region 3, 2006 (EqP)

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Table 1
VOA Soil/Sediment Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/kg)	Project Quantitation Limit (ug/kg)	Analytical Method		Achievable Laboratory Limits		PAL References
				MDLs	Method QLs	MDLs	QLs	
Isopropylbenzene	98-82-8	1,044	5	NA	NA	5	25	NYSDEC, 1999 (EqP)
1,1,2,2-Tetrachloroethane	79-34-5	26	5	NA	NA	5	25	NYSDEC, 1999 (EqP)
1,3-Dichlorobenzene	541-73-1	2,400	5	NA	NA	5	25	USEPA, 2011
1,4-Dichlorobenzene	106-46-7	120	5	NA	NA	5	25	USEPA Region 2, 2010
1,2-Dichlorobenzene	95-50-1	120	5	NA	NA	5	25	USEPA Region 2, 2010
1,2-Dibromo-3-chloropropane	96-12-8	5.4	1	NA	NA	1	5	USEPA, 2013
1,2,4-Trichlorobenzene	120-82-1	4,115	5	NA	NA	5	25	USEPA Region 3, 2006 (EqP)

Reference:

Field, L., D. MacDonald, S. Norton, C,. Ingersoll, C. Severn, D. Smorong, and R. Lindskoog, 2002. *Predicting Amphipod Toxicity from Sediment Chemistry using Logistic Regression Models.* Environmental Toxicology and Chemistry, Vol. 21, No. 9, pp. 1993–2005.

McDonald, R. Carr, F. Calder, E. Long, and C. Ingersoll, 1996. Development and Evaluation of Sediment Quality Guidelines in Florida Coastal Waters. Ecotoxicology 5: 253-278.0.

NYSDEC, 1999. Technical Guidance for Screening Contaminated Sediments. New York State Department of Environmental Conservation. Human health bioaccumulation values.

USEPA, 2011. EPA Regional Human Health Screening Levels (RSLs). June 2011. Lowest of the Residential and Industrial Soil RSLs.

USEPA, 2013. EPA Regional Human Health Screening Levels (RSLs). May 2013. Lowest of the Residential and Industrial Soil RSLs.

USEPA Region 2, 2010. New York Freshwater and Marine Screening Benchmarks.

USEPA Region 3, 2006. USEPA Region 3 Biological Technical Assistance Group (BTAG) Screening Benchmarks. Marine Sediment Benchmarks. Mid Atlantic Risk Assessment, July 2006.

USEPA Region 5, 2003. USEPA Region 5 Resource Conservation Recovery Act (RCRA) Ecological Screening Levels. August 22, 2003.

USEPA Region 6, 1999. USEPA Region 6 Screening Level Ecological Risk Assessment Protocol. Appendix E: Toxicity Reference Values. Office of Solid Waste, Multimedia Planning and Permitting Division, Centre for Combustion Science and Engineering. August 1999.

WA DOE cited in: Buchman, M.F., 2008 (update). National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SquiRT). NOAA HAZMAT Report, Seattle, WA, NOAA.

EqP – Equilibrium partitioning value, dry weight value calculated for 8.7% organic carbon

Appendix E
Table 2
SVOC Soil/Sediment Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/kg)	Project Quantitation Limit (ug/kg)	Analytical Method		Achievable Laboratory Limits		References
				MDLs	Method QLs	MDLs	QLs	
Benzaldehyde	100-52-7	7,800,000	50	NA	NA	50	250	USEPA, 2013
Phenol	108-95-2	427	10	660	NA	10	50	USEPA Region 5, 2003 (EqP)
bis(2-chloroethyl)ether	111-44-4	3	0.6	660	NA	0.6	3	NYSDEC, 1999 (EqP)
2-Chlorophenol	95-57-8	2,993	10	660	NA	10	50	USEPA Region 3, 2006 (EqP)
o-Cresol	95-48-7	482	10	NA	NA	10	50	USEPA Region 5, 2003 (EqP)
Bis(2-chloroisopropyl)ether	108-60-1	1,270	10	660	NA	10	50	USEPA Region 5, 2003 (EqP)
Acetophenone	98-86-2	7,800,000	50	NA	NA	50	250	USEPA, 2013
m & p-cresols		176	10	NA	NA	10	50	USEPA Region 5, 2003 (EqP)
N-Nitrosodi-n-propylamine	621-64-7	69	10	660	NA	10	50	USEPA, 2013
Hexachloroethane	67-72-1	6,995	10	660	NA	10	50	USEPA Region 3, 2006 (EqP)
Nitrobenzene	98-95-3	692	10	660	NA	10	50	USEPA Region 6, 1999 (EqP)
Isophorone	78-59-1	3,758	10	660	NA	10	50	USEPA Region 5, 2003 (EqP)
2-Nitrophenol	88-75-5	18,000,000	10	660	NA	10	50	USEPA, 2011
2,4-Dimethylphenol	105-67-9	2,645	10	660	NA	10	50	USEPA Region 5, 2003 (EqP)
bis(2-chloroethoxy)methane	111-91-1	180,000	10	660	NA	10	50	USEPA, 2013
2,4-Dichlorophenol	120-83-2	711	10	660	NA	10	50	USEPA Region 5, 2003 (EqP)
Naphthalene	91-20-3	160	10	660	NA	10	50	USEPA Region 2, 2010
p-Chloroaniline	106-47-8	176	10	1300	NA	10	50	USEPA Region 5, 2003 (EqP)
Hexachlorobutadiene	87-68-3	16	3	660	NA	3	15	USEPA Region 2, 2010
Caprolactam	105-60-2	31,000,000	10	NA	NA	10	50	USEPA, 2013
4-Chloro-3-methylphenol	59-50-7	3,376	10	1300	NA	10	50	USEPA Region 5, 2003 (EqP)
2-Methylnaphthalene	91-57-6	70	25	660	NA	25	125	USEPA Region 2, 2010
Hexachlorocyclopentadiene	77-47-4	7	0.6	660	NA	0.6	3	USEPA Region 2, 2010
2,4,6-Trichlorophenol	88-06-2	23,055	10	660	NA	10	50	USEPA Region 3, 2006 (EqP)
2,4,5-Trichlorophenol	95-95-4	7,125	10	660	NA	10	50	USEPA Region 3, 2006 (EqP)
Biphenyl	92-52-4	17	10	NA	NA	10	50	Field et al., 2002
2-Chloronaphthalene	91-58-7	3,628	10	660	NA	10	50	USEPA Region 5, 2003 (EqP)
2-Nitroaniline	88-74-4	610,000	10	3300	NA	10	50	USEPA, 2013
Dimethyl phthalate	131-11-3	6	0.6	660	NA	0.6	3	WA DOE (Buchman, 2008)
2,6-Dinitrotoluene	606-20-2	1,200	10	660	NA	10	50	USEPA Region 6, 1999 (EqP)
Acenaphthylene	208-96-8	44	5	660	NA	5	25	USEPA Region 2, 2010
3-Nitroaniline	99-09-2	24,000	10	3300	NA	10	50	USEPA, 2011
Acenaphthene	83-32-9	16	3	660	NA	3	15	USEPA Region 2, 2010
2,4-Dinitrophenol	51-28-5	54	50	NA	NA	50	250	USEPA Region 5, 2003 (EqP)
4-Nitrophenol	100-02-7	116	10	660	NA	10	50	USEPA Region 5, 2003 (EqP)
Dibenzofuran	132-64-9	63,510	10	660	NA	10	50	USEPA Region 3, 2006 (EqP)
2,4-Dinitrotoluene	121-14-2	1,600	3	660	NA	3	15	USEPA, 2013

Appendix E
Table 2
SVOC Soil/Sediment Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/kg)	Project Quantitation Limit (ug/kg)	Analytical Method		Achievable Laboratory Limits		References
				MDLs	Method QLs	MDLs	QLs	
Diethyl phthalate	84-66-2	1,897	10	660	NA	10	50	USEPA Region 3, 2006 (EqP)
Fluorene	86-73-7	19	15	660	NA	15	75	USEPA Region 2, 2010
4-Chlorophenyl phenyl ether	7005-72-3	Not Available	10	660	NA	10	50	
4-Nitroaniline	100-01-6	24,000	10	NA	NA	10	50	USEPA, 2013
4,6-Dinitro-o-cresol	534-52-1	905	10	3300	NA	10	50	USEPA Region 5, 2003 (EqP)
N-Nitrosodiphenylamine	86-30-6	99,000	1	NA	NA	1	5	USEPA, 2013
4-Bromophenyl phenyl ether	101-55-3	13,485	10	660	NA	10	50	USEPA Region 5, 2003 (EqP)
Hexachlorobenzene	118-74-1	13	10	660	NA	10	50	USEPA Region 6, 1999 (EqP)
Atrazine	1912-24-9	2,100	10	NA	NA	10	50	USEPA, 2013
Pentachlorophenol	87-86-5	360	10	3300	NA	10	50	USEPA Region 6, 1999 (TRV)
Phenanthrene	85-01-8	240	15	660	NA	15	75	USEPA Region 2, 2010
Anthracene	120-12-7	85	10	660	NA	10	50	USEPA Region 2, 2010
Carbazole	86-74-8	Not Available	10	NA	NA	10	50	
Dibutyl phthalate	84-74-2	10,092	15	NA	NA	15	75	USEPA Region 3, 2006 (EqP)
Fluoranthene	206-44-0	600	10	660	NA	10	50	USEPA Region 2, 2010
Pyrene	129-00-0	665	10	NA	NA	10	50	USEPA Region 2, 2010
Butyl benzyl phthalate	85-68-7	146,160	10	660	NA	10	50	USEPA Region 3, 2006 (EqP)
3,3`-Dichlorobenzidine	91-94-1	1,100	10	1300	NA	10	50	USEPA, 2013
Benzo(a)anthracene	56-55-3	61	10	660	NA	10	50	NYSDEC, 1999 (EqP)
Chrysene	218-01-9	61	10	660	NA	10	50	NYSDEC, 1999 (EqP)
Bis(2-ethylhexyl)phthalate	117-81-7	182	10	NA	NA	10	50	McDonald et al., 1996
Di-n-octyl phthalate	117-84-0	1,262	10	660	NA	10	50	USEPA Region 6, 1999 (EqP)
Benzo(b)fluoranthene	205-99-2	61	10	660	NA	10	50	NYSDEC, 1999 (EqP)
Benzo(k)fluoranthene	207-08-9	61	10	660	NA	10	50	NYSDEC, 1999 (EqP)
Benzo(a)pyrene	50-32-8	15	3	660	NA	3	15	USEPA, 2013
Indeno(1,2,3-cd)pyrene	193-39-5	61	10	660	NA	10	50	NYSDEC, 1999 (EqP)
Dibenzo(a,h)anthracene	53-70-3	15	10	NA	NA	10	50	USEPA, 2013
Benzo(g,h,i)perylene	191-24-2	67	10	660	NA	10	50	Field et al., 2002

Reference:

Field, L., D. MacDonald, S. Norton, C,. Ingersoll, C. Severn, D. Smorong, and R. Lindskoog, 2002. *Predicting Amphipod Toxicity from Sediment Chemistry using Logistic Regression Models.* Environmental Toxicology and Chemistry, Vol. 21, No. 9, pp. 1993–2005.

McDonald, R. Carr, F. Calder, E. Long, and C. Ingersoll, 1996. Development and Evaluation of Sediment Quality Guidelines in Florida Coastal Waters. Ecotoxicology 5: 253-278.0.

NYSDEC, 1999. Technical Guidance for Screening Contaminated Sediments. New York State Department of Environmental Conservation. Human health bioaccumulation values.

USEPA, 2011. EPA Regional Human Health Screening Levels (RSLs). June 2011. Lowest of the Residential and Industrial Soil RSLs.

USEPA, 2013. EPA Regional Human Health Screening Levels (RSLs). May 2013. Lowest of the Residential and Industrial Soil RSLs.
USEPA Region 2, 2010. New York Freshwater and Marine Screening Benchmarks.
USEPA Region 3, 2006. USEPA Region 3 Biological Technical Assistance Group (BTAG) Screening Benchmarks. Marine Sediment Benchmarks. Mid Atlantic Risk Assessment, July 2006.
USEPA Region 5, 2003. USEPA Region 5 Resource Conservation Recovery Act (RCRA) Ecological Screening Levels. August 22, 2003.
USEPA Region 6, 1999. USEPA Region 6 Screening Level Ecological Risk Assessment Protocol. Appendix E: Toxicity Reference Values. Office of Solid Waste, Multimedia Planning and Permitting Division, Centre for Combustion Science and Engineering. August 1999.
WA DOE cited in: Buchman, M.F., 2008 (update). National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SquiRT). NOAA HAZMAT Report, Seattle, WA, NOAA.

EqP – Equilibrium partitioning value, dry weight value calculated for 8.7% organic carbon

Appendix E
Table 3
PCB Soil/Sediment Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/kg)	Project Quantitation Limit (ug/kg)	Analytical Method		Achievable Laboratory Limits		References
				MDLs	Method QLs	MDLs	QLs (ug/kg)	
Aroclor-1016 (see note 3&4)	12674-11-2	0.0696	0.02	NA	NA	0.02	0.06	NYSDEC, 1999 (EqP)
Aroclor-1221 (see note 4)	11104-28-2	0.0696	0.02	NA	NA	0.02	0.06	NYSDEC, 1999 (EqP)
Aroclor-1232 (see note 4)	11141-16-5	0.0696	0.02	NA	NA	0.02	0.06	NYSDEC, 1999 (EqP)
Aroclor-1242 (see note 4)	53469-21-9	0.0696	0.02	NA	NA	0.02	0.06	NYSDEC, 1999 (EqP)
Aroclor-1248 (see note 4)	12672-29-6	0.0696	0.02	NA	NA	0.02	0.06	NYSDEC, 1999 (EqP)
Aroclor-1254 (see note 4)	11097-69-1	0.0696	0.02	NA	NA	0.02	0.06	NYSDEC, 1999 (EqP)
Aroclor-1260 (see note 4)	11096-82-5	0.0696	0.02	NA	NA	0.02	0.06	NYSDEC, 1999 (EqP)

Note 3- Arochlor 1016 is historically the least sensitive of the PCB Arochlors presented in worksheet #15, experience has also demonstrated that it is a 10 fold factor less sensitive than the rest.

Note 4-The MDLs & QLs specified herein for the soil matrix of the arochlors is an expected value based on modifying the extraction volume and maybe even the instrument, using an MSD in SIM mode instead of an ECD detector. The PALs are extremely low for a soil matrix, the typical MDL of water is 0.065 ug/L, and here we're required to reach 0.069 ug/kg for soil (similar in magnitude), where in water we would extract 1000 ml of water, in soil we extract only 25-30 gms.

Reference:

NYSDEC, 1999. Technical Guidance for Screening Contaminated Sediments. New York State Department of Environmental Conservation. Human health bioaccumulation values.

EqP – Equilibrium partitioning value, dry weight value calculated for 8.7% organic carbon

Appendix E
Table 4
Metals Soil/Sediment Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (mg/kg)	Project Quantitation Limit (mg/kg)	Analytical Method		Achievable Laboratory Limits		References
				MDLs	Method QLs	MDLs	QLs	
Arsenic	7440-38-2	2.4	0.3	0.1	NA	0.3	1.0	USEPA, 2013
Barium	7440-39-3	130,000	0.1	0.1	NA	0.1	0.5	WA DOE (Buchman, 2008)
Cadmium	7440-43-9	800	0.1	0.1	NA	0.1	0.5	USEPA, 2013
Chromium	7440-47-3	5.6	0.1	0.1	NA	0.1	0.5	USEPA, 2013
Lead	7439-92-1	800	0.2	0.1	NA	0.2	0.5	USEPA, 2013
Mercury	7439-97-6	43	0.002	0.0017	NA	0.002	0.01	USEPA, 2013
Selenium	7782-49-2	1000	0.2	0.1	NA	0.2	0.4	WA DOE (Buchman, 2008)
Silver	7440-22-4	5100	0.1	0.1	NA	0.1	0.5	USEPA, 2013

Reference:

WA DOE cited in: Buchman, M.F., 2008 (update). National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SquiRT). NOAA HAZMAT Report, Seattle, WA, NOAA.

USEPA, 2013. EPA Regional Human Health Screening Levels (RSLs). May 2013. Industrial Soil RSLs.

Appendix E
Table 5
EPH/VPH Soil/Sediment Quantitation Limits Table

Analyte*	CAS Number	Protection Action Limit (mg/kg)	Project Quantitation Limit (applicable units)	Analytical Method		Achievable Laboratory Limits		References
				MDLs	Method QLs	MDLs	QLs	
Volatile Petroleum Hydrocarbons (VPH)	CASID30181							
C5 – C8 Aliphatic		500	5	0.97	10	1	5	Mass, 2002
C9 – C12 Aliphatic		5000	0.25	0.025	10	0.05	0.25	Mass, 2002
C9 – C10 Aromatic		300	1	0.23	10	0.25	1	Mass, 2002
Extractable Petroleum Hydrocarbons (EPH)	CASID30102							
C9 – C18 Aliphatic		5000	2	360	20	0.4	2	Mass, 2002
C19 – C36 Aliphatic		5000	5	1120	20	1	5	Mass, 2002
C11 – C22 Aromatic		1000	1.5	250	20	0.3	1.5	Mass, 2002

Notes:
Total reported by Carbon group, will not measure Individual Targets aromatics only totaled by group.

Reference:
Mass, 2002.Commonwealth of Massachusetts Executive Office of Environmental Affairs, Department of Environmental Protection, *Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of the MADEP VPH/EPH Approach*, October 31, 2002, Policy #WSC-02-411.

Appendix E
Table 6
TPH Soil/Sediment Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (mg/kg)	Project Quantitation Limit (mg/kg)	Analytical Method		Achievable Laboratory Limits		PAL References	References
				MDLs	Method QLs	MDLs	QLs		
Total Petroleum Hydrocarbons (TPH)	NA	Not Available	0.5	N/A	N/A	0.1	0.5		

Notes:
Total value without silica gel treatment (will include polar and non-polar materials extractable in Hexane).

Appendix E
Table 7
VOA Groundwater Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (ug/L)	Analytical Method		Achievable Laboratory Limits		References
				MDLs (ug/L)	Method QLs (ug/L)	MDLs (ug/L)	QLs (ug/L)	
Dichlorodifluoromethane	75-71-8	190	4.0	0.10	0.5	3.97	20	USEPA, 2013
Chloromethane	74-87-3	190	5.4	0.13	0.65	5.36	27	USEPA, 2013
Vinyl chloride	75-01-4	0.015	0.2	0.17	0.85	0.010	1.0	USEPA, 2013
Bromomethane	74-83-9	7	0.5	0.11	0.55	0.5	2.5	USEPA, 2013
Chloroethane	75-00-3	21,000	1.8	0.10	0.50	1.82	9	USEPA, 2013
Trichlorofluoromethane	75-69-4	1,100	5.1	0.08	0.40	5.10	26	USEPA, 2013
1,1-Dichloroethene	75-35-4	260	6.4	0.12	0.60	6.39	32	USEPA, 2013
Acetone	67-64-1	12,000	1.6	NA	NA	1.57	8	USEPA, 2013
Carbon disulfide	75-15-0	1000	5.9	NA	NA	5.88	29	USEPA, 2013
Methylene chloride	75-09-2	9.9	0.5	0.03	0.15	0.5	2.5	USEPA, 2013
trans-1,2-Dichloroethene	156-60-5	86	10.1	0.06	0.30	10.07	50	USEPA, 2013
Methyl tert-butyl ether	1634-04-4	12	1.0	NA	NA	1.0	5	USEPA, 2013
1,1-Dichloroethane	75-34-3	2.4	1.0	0.04	0.20	1.0	5	USEPA, 2013
cis-1,2-Dichloroethene	156-59-2	28	5.9	0.12	0.60	5.87	29	USEPA, 2013
2-Butanone	78-93-3	4,900	1.8	NA	NA	1.80	9	USEPA, 2013
Chloroform	67-66-3	0.19	0.03	0.03	0.15	0.03	0.15	USEPA, 2013
1,1,1-Trichloroethane	71-55-6	7,500	4.3	0.08	0.40	4.29	21	USEPA, 2013
Carbon tetrachloride	56-23-5	0.39	0.20	0.21	1.05	0.20	1.0	USEPA, 2013
Benzene	71-43-2	0.39	0.05	0.04	0.20	0.05	0.25	USEPA, 2013
1,2-Dichloroethane	107-06-2	0.15	0.05	0.06	0.30	0.05	0.25	USEPA, 2013
Trichloroethene	79-01-6	0.44	1.0	0.19	0.95	1.0	5	USEPA, 2013
1,2-Dichloropropane	78-87-5	0.38	0.05	0.04	0.20	0.05	0.25	USEPA, 2013
Bromodichloromethane	75-27-4	0.12	0.08	0.08	0.40	0.08	0.40	USEPA, 2013
cis-1,3-Dichloropropene	10061-01-5	Not Available	5.7	NA	NA	5.69	28	USEPA, 2013
4-Methyl-2-pentanone	108-10-1	1,000	3.3	NA	NA	3.25	16	USEPA, 2013
Toluene	108-88-3	860	1.5	0.11	0.55	1.47	7	USEPA, 2013
trans-1,3-Dichloropropene	10061-02-6	Not Available	1.9	NA	NA	1.87	9	USEPA, 2013
1,1,2-Trichloroethane	79-00-5	0.24	0.1	0.10	0.50	0.1	0.5	USEPA, 2013
Tetrachloroethene	127-18-4	9.7	0.1	0.14	0.70	0.1	0.5	USEPA, 2013
2-Hexanone	591-78-6	34	3.0	NA	NA	3.02	15	USEPA, 2013
Chlorodibromomethane	124-48-1	0.15	0.1	0.05	0.25	0.1	0.5	USEPA, 2013
1,2-Dibromoethane	106-93-4	0.0065	0.015	0.06	0.30	0.005	0.045	USEPA, 2013
Chlorobenzene	108-90-7	72	5.5	0.04	0.20	5.49	27	USEPA, 2013
Ethylbenzene	100-41-4	1.3	0.1	0.06	0.30	0.1	0.5	USEPA, 2013
Xylene (total)	1330-20-7	190	15.2	0.29	1.45	15.21	76	USEPA, 2013
Styrene	100-42-5	1,100	5.2	0.04	0.20	5.16	26	USEPA, 2013
Bromoform	75-25-2	7.9	1.0	0.12	0.60	1.0	5	USEPA, 2013

Appendix E
Table 7
VOA Groundwater Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (ug/L)	Analytical Method		Achievable Laboratory Limits		References
				MDLs (ug/L)	Method QLs (ug/L)	MDLs (ug/L)	QLs (ug/L)	
Isopropylbenzene	98-82-8	390	4.7	0.15	0.75	4.69	23	USEPA, 2013
1,1,2,2-Tetrachloroethane	79-34-5	0.066	0.015	0.04	0.20	0.015	0.045	USEPA, 2013
1,3-Dichlorobenzene	541-73-1	Not Available	5.7	0.12	0.60	5.65	28	USEPA, 2013
1,4-Dichlorobenzene	106-46-7	0.42	0.05	0.04	0.20	0.05	0.25	USEPA, 2013
1,2-Dichlorobenzene	95-50-1	280	0.6	0.03	0.15	0.56	3	USEPA, 2013
1,2-Dibromo-3-chloropropane	96-12-8	0.00032	0.02	0.26	1.30	0.02	0.10	USEPA, 2013
1,2,4-Trichlorobenzene	120-82-1	0.99	0.25	0.04	0.20	0.25	1.3	USEPA, 2013

Reference:
USEPA, 2013. EPA Regional Human Health Screening Levels (RSLs). May 2013. Tapwater RSLs.

Appendix E
Table 8
SVOC Groundwater Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (ug/L)	Analytical Method		Achievable Laboratory Limits		References
				MDLs (ug/L)	Method QLs (ug/L)	MDLs (ug/L)	QLs (ug/L)	
Benzaldehyde	100-52-7	1,500	10.0	NA	NA	10.0	50	USEPA, 2013
Phenol	108-95-2	4,500	2.0	10	NA	2.0	10	USEPA, 2013
bis(2-chloroethyl)ether	111-44-4	0.012	0.002	NA	NA	0.002	0.010	USEPA, 2013
2-Chlorophenol	95-57-8	71	2.0	10	NA	2.0	10	USEPA, 2013
o-Cresol	95-48-7	720	2.0	10	NA	2.0	10	USEPA, 2013
Bis(2-chloroisopropyl)ether **(see note 1)**	108-60-1	0.31	0.021	10	NA	0.021	0.105	USEPA, 2013
Acetophenone	98-86-2	1,500	10.0	10	NA	10.0	50	USEPA, 2013
m & p-cresols		720	2.0	20	NA	2.0	10	USEPA, 2013
N-Nitrosodi-n-propylamine **(see note 2)**	621-64-7	0.0093	0.0020	10	NA	0.0020	0.0100	USEPA, 2013
Hexachloroethane	67-72-1	0.79	1.0	10	NA	0.5	5.0	USEPA, 2013
Nitrobenzene **(see note 1)**	98-95-3	0.12	0.021	10	NA	0.021	0.105	USEPA, 2013
Isophorone	78-59-1	67	2.0	10	NA	2.0	10	USEPA, 2013
2-Nitrophenol	88-75-5	Not Available	2.0	10	NA	2.0	10	USEPA, 2013
2,4-Dimethylphenol	105-67-9	270	2.0	10	NA	2.0	10	USEPA, 2013
bis(2-chloroethoxy)methane	111-91-1	46	2.0	10	NA	2.0	10	USEPA, 2013
2,4-Dichlorophenol	120-83-2	35	2.0	10	NA	2.0	10	USEPA, 2013
Naphthalene **(see note 1)**	91-20-3	0.14	0.021	10	NA	0.021	0.105	USEPA, 2013
p-Chloroaniline **(see note 1)**	106-47-8	0.32	0.021	20	NA	0.021	0.105	USEPA, 2013
Hexachlorobutadiene **(see note 2)**	87-68-3	0.26	0.021	10	NA	0.021	0.105	USEPA, 2013
Caprolactam	105-60-2	7,700	2.0	NA	NA	2.0	10	USEPA, 2013
4-Chloro-3-methylphenol	59-50-7	1,100	2.0	20	NA	2.0	10	USEPA, 2013
2-Methylnaphthalene	91-57-6	27	5.0	10	NA	5.0	25	USEPA, 2013
Hexachlorocyclopentadiene	77-47-4	22	2.0	10	NA	2.0	10	USEPA, 2013
2,4,6-Trichlorophenol	88-06-2	3.5	1.0	10	NA	1.0	5.0	USEPA, 2013
2,4,5-Trichlorophenol	95-95-4	890	2.0	10	NA	2.0	10	USEPA, 2013
Biphenyl **(see note 1)**	92-52-4	0.83	0.05	NA	NA	0.05	0.25	USEPA, 2013
2-Chloronaphthalene	91-58-7	550	2.0	10	NA	2.0	10	USEPA, 2013
2-Nitroaniline	88-74-4	150	2.0	50	NA	2.0	10	USEPA, 2013
Dimethyl phthalate	131-11-3	Not Available	2.0	10	NA	2.0	10	USEPA, 2013
2,6-Dinitrotoluene	606-20-2	0.042	2.0	10	NA	0.04	10	USEPA, 2013
Acenaphthylene	208-96-8	Not Available	2.0	10	NA	2.0	10	USEPA, 2013
3-Nitroaniline	99-09-2	Not Available	2.0	50	NA	2.0	10	USEPA, 2013
Acenaphthene	83-32-9	400	2.0	10	NA	2.0	10	USEPA, 2013
2,4-Dinitrophenol	51-28-5	30	3.0	50	NA	3.0	15	USEPA, 2013
4-Nitrophenol	100-02-7	Not Available	2.0	50	NA	2.0	10	USEPA, 2013
Dibenzofuran	132-64-9	5.8	2.0	10	NA	2.0	10	USEPA, 2013
2,4-Dinitrotoluene	121-14-2	0.2	0.05	10	NA	0.05	0.25	USEPA, 2013

Appendix E
Table 8
SVOC Groundwater Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (ug/L)	Analytical Method		Achievable Laboratory Limits		References
				MDLs (ug/L)	Method QLs (ug/L)	MDLs (ug/L)	QLs (ug/L)	
Diethyl phthalate	84-66-2	11,000	2.0	10	NA	2.0	10	USEPA, 2013
Fluorene	86-73-7	220	3.0	10	NA	3.0	15	USEPA, 2013
4-Chlorophenyl phenyl ether	7005-72-3	Not Available	2.0	10	NA	2.0	10	USEPA, 2013
4-Nitroaniline	100-01-6	3.3	2.0	20	NA	2.0	10	USEPA, 2013
4,6-Dinitro-o-cresol	534-52-1	1.2	0.10	50	NA	0.1	0.5	USEPA, 2013
N-Nitrosodiphenylamine	86-30-6	10	1.0	10	NA	1.0	5.0	USEPA, 2013
4-Bromophenyl phenyl ether	101-55-3	Not Available	2.0	10	NA	2.0	10	USEPA, 2013
Hexachlorobenzene **(see note 1)**	118-74-1	0.042	0.002	10	NA	0.002	0.010	USEPA, 2013
Atrazine **(see note 1)**	1912-24-9	0.26	0.021	NA	NA	0.021	0.105	USEPA, 2013
Pentachlorophenol **(see note 1)**	87-86-5	0.035	0.021	50	NA	0.021	0.105	USEPA, 2013
Phenanthrene	85-01-8	Not Available	3.0	10	NA	3.0	15	USEPA, 2013
Anthracene	120-12-7	1,300	2.0	10	NA	2.0	10	USEPA, 2013
Carbazole	86-74-8	Not Available	2.0	NA	NA	2.0	10	USEPA, 2013
Dibutyl phthalate	84-74-2	670	3.0	10	NA	3.0	15	USEPA, 2013
Fluoranthene	206-44-0	630	2.0	10	NA	2.0	10	USEPA, 2013
Pyrene	129-00-0	87	2.0	10	NA	2.0	10	USEPA, 2013
Butyl benzyl phthalate	85-68-7	14	2.0	10	NA	2.0	10	USEPA, 2013
3,3`-Dichlorobenzidine **(see note 1)**	91-94-1	0.011	0.002	20	NA	0.002	0.010	USEPA, 2013
Benzo(a)Anthracene **(see note 1)**	56-55-3	0.029	0.021	10	NA	0.021	0.105	USEPA, 2013
Chrysene **(see note 1)**	218-01-9	2.9	0.021	10	NA	0.021	0.105	USEPA, 2013
Bis(2-ethylhexyl)phthalate	117-81-7	4.8	0.020	NA	NA	0.020	0.100	USEPA, 2013
Di-n-octyl phthalate	117-84-0	160	3.0	10	NA	3.0	15	USEPA, 2013
Benzo(b)fluoranthene **(see note 1)**	205-99-2	0.029	2.0	10	NA	2.0	10	USEPA, 2013
Benzo(k)fluoranthene **(see note 1)**	207-08-9	0.29	2.0	50	NA	2.0	10	USEPA, 2013
Benzo(a)pyrene **(see note 2)**	50-32-8	0.0029	2.0	10	NA	2.0	10	USEPA, 2013
Indeno(1,2,3-cd)pyrene **(see note 1)**	193-39-5	0.029	3.0	50	NA	3.0	15	USEPA, 2013
Dibenzo(a,h)Anthracene **(see note 2)**	53-70-3	0.0029	0.001	10	NA	0.001	0.005	USEPA, 2013
Benzo(g,h,i)perylene	191-24-2	Not Available	2.0	10	NA	2.0	10	USEPA, 2013

Note 1- Lab will achieve the PALs by programming run using SCAN & SIM modes on the GCMS, similar runs with past samples at CORCO in this manner permitted the lab to reach and/or exceed similar project action limit.

Note 2- After performing the SIM mode run as presented in note 2, the MCL value presented as the project action limit may still not be achievable, additional optimization may still be needed but no guarantees can be made.

Reference:
USEPA, 2013. EPA Regional Human Health Screening Levels (RSLs). May 2013. Tapwater RSLs.

Appendix E
Table 9
Metals Groundwater Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (ug/L)	Analytical Method		Achievable Laboratory Limits		References
				MDLs (ug/L)	Method QLs (ug/L)	MDLs (ug/L)	QLs (ug/L)	
Arsenic **(note 5)**	7440-38-2	0.045	0.03	1.0	NA	0.03	0.15	USEPA, 2013
Barium	7440-39-3	2900	0.20	1.0	NA	0.20	1.0	USEPA, 2013
Cadmium	7440-43-9	6.9	0.20	1.0	NA	0.20	1.0	USEPA, 2013
Chromium **(note 5)**	7440-47-3	0.031	0.03	1.0	NA	0.03	0.15	USEPA, 2013
Lead	7439-92-1	15	0.20	1.0	NA	0.20	1.0	USEPA, 2013
Mercury	7439-97-6	0.63	0.05	0.017	NA	0.05	0.25	USEPA, 2013
Selenium	7782-49-2	78	0.40	1.0	NA	0.40	2.0	USEPA, 2013
Silver	7440-22-4	71	0.20	1.0	NA	0.20	1.0	USEPA, 2013

Note 5- Requires a concentration step in the sample prep procedure.

Reference:
USEPA, 2013. EPA Regional Human Health Screening Levels (RSLs). May 2013. Tapwater RSLs.

Appendix E
Table 10
VPH/EPH Groundwater Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (applicable units)	Analytical Method		Achievable Laboratory Limits		References
				MDLs	Method QLs	MDLs	QLs	
Volatile Petroleum Hydrocarbons (VPH)	CASID30181							
C5 – C8 Aliphatic		500,000	50	4.80	150	10.0	50.0	Mass, 2002
C9 – C12 Aliphatic		5,000,000	5	0.44	150	1.0	5.0	Mass, 2002
C9 – C10 Aromatic		300,000	50	4.77	150	10.0	50.0	Mass, 2002
Extractable Petroleum Hydrocarbons (EPH)	CASID30102							
C9 – C18 Aliphatic		5,000,000	25	0.102	100	5	25	Mass, 2002
C19 – C36 Aliphatic		5,000,000	25	0..375	100	5	25	Mass, 2002
C11 – C22 Aromatic		1,000,000	25	0.680	100	5	25	Mass, 2002

Notes:
Total reported by Carbon group, will not measure Individual Targets aromatics only totaled by group.

Reference:
Mass, 2002.Commonwealth of Massachusetts Executive Office of Environmental Affairs, Department of Environmental Protection, *Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of the MADEP VPH/EPH Approach*, October 31, 2002, Policy #WSC-02-411.

Appendix E
Table 11
TPH Groundwater Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (applicable units)	Analytical Method		Achievable Laboratory Limits		References
				MDLs	Method QLs	MDLs	QLs	
Total Petroleum Hydrocarbons (EPH)	NA	Not Available	1,200	1400	5,000	1,200	5,000	

Notes:
Total value without silica gel treatment (will include polar and non-polar materials extractable in Hexane.

Appendix E
Table 12
VOA Surface water Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (ug/L)	Analytical Method		Achievable Laboratory Limits		References
				MDLs (ug/L)	Method QLs (ug/L)	MDLs (ug/L)	QLs (ug/L)	
Dichlorodifluoromethane	75-71-8	5	4.0	0.10	0.5	3.97	20	NYSDEC, 1998
Chloromethane	74-87-3	5	5.4	0.13	0.65	1.0	27	NYSDEC, 1998
Vinyl chloride	75-01-4	0.015	0.2	0.17	0.85	0.01	1.0	USEPA, 2013
Bromomethane	74-83-9	5	0.5	0.11	0.55	0.5	2.5	NYSDEC, 1998
Chloroethane	75-00-3	5	1.8	0.10	0.50	1.82	9	NYSDEC, 1998
Trichlorofluoromethane	75-69-4	5	5.1	0.08	0.40	0.05	26	NYSDEC, 1998
1,1-Dichloroethene	75-35-4	0.7	6.4	0.12	0.60	6.39	32	NYSDEC, 1998
Acetone	67-64-1	50	1.6	NA	NA	1.57	8	NYSDEC, 1998
Carbon disulfide	75-15-0	0.92	5.9	NA	NA	0.5	29	Suter and Tsao, 1996
Methylene chloride	75-09-2	4.6	0.5	0.03	0.15	0.5	2.5	USEPA, 2009
trans-1,2-Dichloroethene	156-60-5	5	10.1	0.06	0.30	0.5	50	NYSDEC, 1998
Methyl tert-butyl ether	1634-04-4	12	1.0	NA	NA	1.0	5	USEPA, 2013
1,1-Dichloroethane	75-34-3	2.4	1.0	0.04	0.20	0.05	5	USEPA, 2013
cis-1,2-Dichloroethene	156-59-2	5	5.9	0.12	0.60	0.5	29	NYSDEC, 1998
2-Butanone	78-93-3	50	1.8	NA	NA	1.80	9	NYSDEC, 1998
Chloroform	67-66-3	0.19	0.03	0.03	0.15	0.03	0.15	USEPA, 2013
1,1,1-Trichloroethane	71-55-6	5	4.3	0.08	0.40	4.29	21	NYSDEC, 1998
Carbon tetrachloride	56-23-5	0.23	0.20	0.21	1.05	0.20	1.0	NYSDEC, 1998
Benzene	71-43-2	0.39	0.05	0.04	0.20	0.05	0.25	USEPA, 2013
1,2-Dichloroethane	107-06-2	0.15	0.05	0.06	0.30	0.05	0.25	USEPA, 2013
Trichloroethene	79-01-6	0.44	1.0	0.19	0.95	0.05	5	USEPA, 2013
1,2-Dichloropropane	78-87-5	0.38	0.05	0.04	0.20	0.05	0.25	USEPA, 2013
Bromodichloromethane	75-27-4	0.12	0.08	0.08	0.40	0.08	0.40	USEPA, 2013
cis-1,3-Dichloropropene	10061-01-5	0.055	5.7	NA	NA	0.05	28	Buchman, 2008
4-Methyl-2-pentanone	108-10-1	1000	3.3	NA	NA	3.25	16	USEPA, 2013
Toluene	108-88-3	5	1.5	0.11	0.55	1.47	7	NYSDEC, 1998
trans-1,3-Dichloropropene	10061-02-6	0.055	1.9	NA	NA	0.05	9	Buchman, 2008
1,1,2-Trichloroethane	79-00-5	0.24	0.1	0.10	0.50	0.1	0.5	USEPA, 2013
Tetrachloroethene	127-18-4	0.11	0.1	0.14	0.70	0.1	0.5	USEPA, 2011
2-Hexanone	591-78-6	34	3.0	NA	NA	3.02	15	USEPA, 2013
Chlorodibromomethane	124-48-1	0.15	0.1	0.05	0.25	0.1	0.5	USEPA, 2013
1,2-Dibromoethane	106-93-4	0.0065	0.015	0.06	0.30	0.005	0.045	USEPA, 2013
Chlorobenzene	108-90-7	5	5.5	0.04	0.20	0.5	27	NYSDEC, 1998
Ethylbenzene	100-41-4	1.3	0.1	0.06	0.30	0.1	0.5	USEPA, 2013
Xylene (total)	1330-20-7	5	15.2	0.29	1.45	0.5	76	NYSDEC, 1998
Styrene	100-42-5	5	5.2	0.04	0.20	0.5	26	NYSDEC, 1998
Bromoform	75-25-2	4.3	1.0	0.12	0.60	1.0	5	USEPA, 2009

Appendix E
Table 12
VOA Surface water Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (ug/L)	Analytical Method		Achievable Laboratory Limits		References
				MDLs (ug/L)	Method QLs (ug/L)	MDLs (ug/L)	QLs (ug/L)	
Isopropylbenzene	98-82-8	5	4.7	0.15	0.75	4.69	23	NYSDEC, 1998
1,1,2,2-Tetrachloroethane	79-34-5	0.066	0.015	0.04	0.20	0.015	0.045	USEPA, 2013
1,3-Dichlorobenzene	541-73-1	0.43	5.7	0.12	0.60	0.05	28	USEPA, 2011
1,4-Dichlorobenzene	106-46-7	0.42	0.05	0.04	0.20	0.05	0.25	USEPA, 2013
1,2-Dichlorobenzene	95-50-1	3	0.6	0.03	0.15	0.56	3	NYSDEC, 1998
1,2-Dibromo-3-chloropropane **(see note 1)**	96-12-8	0.00032	0.02	0.26	1.30	0.005	0.10	USEPA, 2013
1,2,4-Trichlorobenzene	120-82-1	0.99	0.25	0.04	0.20	0.25	1.3	USEPA, 2013

Note 1: The analytes herein are not routinely asked to be detected at the level observed in the PAL, however, using SIM mode for lower the level of detection experienced in similar requests have shown that the PAL will be reached or exceeded as seen in the MDL presented.

Note 2: It is herein advised that this analyte will be detected in the manner noted in "note 1" however, the detction level required in the PAL may not be achievable even when detection is performed using SIM mode on the GCMS. The value reported may be as low as it can get. Never the less, every effort will be made to achieve the PAL presented.

References:

Buchman, 2008. Screening Quick Reference Table (SQuiRT). NOAA OR&R Report 08-1.
NYSDEC, 1998. New York State Department of Environmental Conservation. Division of Water Technical and Operational Guidance (TOGS) Series (1.1.1).
Suter and Tsao, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota. ES/ER/TM-96/R2. June 1996.
USEPA, 2011. USEPA Regional Screening Levels (RSLs). June 2011. Selected screening levels are Tap Water (Tap.) or Maximum Contaminant Level (MCLs) for drinking water values.
USEPA, 2009. USEPA National Recommended Ambient Water Quality Criteria (AWQC), 2009.
USEPA, 2013. EPA Regional Human Health Screening Levels (RSLs). May 2013. Tapwater RSLs.

Appendix E
Table 13
SVOC Surface water Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (ug/L)	Analytical Method		Achievable Laboratory Limits		References
				MDLs (ug/L)	Method QLs (ug/L)	MDLs (ug/L)	QLs (ug/L)	
Benzaldehyde	100-52-7	1500	10.0	NA	NA	10.0	50	USEPA, 2013
Phenol	108-95-2	1	2.0	10	NA	0.5	10	NYSDEC, 1998
bis(2-chloroethyl)ether	111-44-4	0.012	0.002	NA	NA	0.002	0.010	USEPA, 2013
2-Chlorophenol	95-57-8	1	2.0	10	NA	0.5	10	NYSDEC, 1998
o-Cresol	95-48-7	1	2.0	10	NA	0.5	10	NYSDEC, 1998
Bis(2-chloroisopropyl)ether **(see note 1)**	108-60-1	0.31	0.021	10	NA	0.021	0.105	USEPA, 2013
Acetophenone	98-86-2	1500	10.0	10	NA	10.0	50	USEPA, 2013
m & p-cresols		1	2.0	20	NA	0.5	10	NYSDEC, 1998
N-Nitrosodi-n-propylamine **(see note 2)**	621-64-7	0.005	0.0020	10	NA	0.0020	0.0100	USEPA, 2009
Hexachloroethane	67-72-1	0.6	1.0	10	NA	0.5	5.0	NYSDEC, 1998
Nitrobenzene **(see note 1)**	98-95-3	0.12	0.021	10	NA	0.021	0.105	USEPA, 2013
Isophorone	78-59-1	35	2.0	10	NA	2.0	10	USEPA, 2009
2-Nitrophenol	88-75-5	1	2.0	10	NA	0.5	10	NYSDEC, 1998
2,4-Dimethylphenol	105-67-9	42.4	2.0	10	NA	2.0	10	ODEQ, 1998
bis(2-chloroethoxy)methane	111-91-1	5	2.0	10	NA	2.0	10	NYSDEC, 1998
2,4-Dichlorophenol	120-83-2	5	2.0	10	NA	2.0	10	NYSDEC, 1998
Naphthalene **(see note 1)**	91-20-3	0.14	0.021	10	NA	0.021	0.105	USEPA, 2011
p-Chloroaniline **(see note 1)**	106-47-8	0.32	0.021	20	NA	0.021	0.105	USEPA, 2013
Hexachlorobutadiene **(see note 2)**	87-68-3	0.01	0.021	10	NA	0.021	0.105	NYSDEC, 1998
Caprolactam	105-60-2	7700	2.0	NA	NA	2.0	10	USEPA, 2013
4-Chloro-3-methylphenol **(see note 4)**	59-50-7	0.3	2.0	20	NA	0.5	10	USEPA Region 4, 2001
2-Methylnaphthalene	91-57-6	4.2	5.0	10	NA	0.5	25	USEPA Region 2, 2010
Hexachlorocyclopentadiene	77-47-4	0.07	2.0	10	NA	0.05	10	USEPA Region 2, 2010
2,4,6-Trichlorophenol	88-06-2	1	1.0	10	NA	1.0	5.0	NYSDEC, 1998
2,4,5-Trichlorophenol	95-95-4	1	2.0	10	NA	0.5	10	NYSDEC, 1998
Biphenyl **(see note 1)**	92-52-4	0.83	0.05	NA	NA	0.05	0.25	USEPA, 2013
2-Chloronaphthalene	91-58-7	10	2.0	10	NA	2.0	10	NYSDEC, 1998
2-Nitroaniline	88-74-4	5	2.0	50	NA	2.0	10	NYSDEC, 1998
Dimethyl phthalate	131-11-3	3.4	2.0	10	NA	2.0	10	Buchman, 2008
2,6-Dinitrotoluene **(see note 4)**	606-20-2	0.042	2.0	10	NA	0.05	10	USEPA, 2013
Acenaphthylene	208-96-8	20	2.0	10	NA	2.0	10	NYSDEC, 1998
3-Nitroaniline	99-09-2	3.4	2.0	50	NA	2.0	10	USEPA, 2011
Acenaphthene	83-32-9	6.6	2.0	10	NA	2.0	10	USEPA Region 2, 2010
2,4-Dinitrophenol	51-28-5	10	3.0	50	NA	3.0	15	NYSDEC, 1998
4-Nitrophenol	100-02-7	1	2.0	50	NA	0.5	10	NYSDEC, 1998
Dibenzofuran	132-64-9	5.8	2.0	10	NA	2.0	10	USEPA, 2013
2,4-Dinitrotoluene	121-14-2	0.11	0.05	10	NA	0.05	0.25	USEPA, 2009

Appendix E
Table 13
SVOC Surface water Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (ug/L)	Analytical Method		Achievable Laboratory Limits		References
				MDLs (ug/L)	Method QLs (ug/L)	MDLs (ug/L)	QLs (ug/L)	
Diethyl phthalate	84-66-2	3.4	2.0	10	NA	2.0	10	Buchman, 2008
Fluorene	86-73-7	2.5	3.0	10	NA	0.5	15	USEPA Region 2, 2010
4-Chlorophenyl phenyl ether	7005-72-3	Not Available	2.0	10	NA	2.0	10	--
4-Nitroaniline	100-01-6	3.3	2.0	20	NA	2.0	10	USEPA, 2013
4,6-Dinitro-o-cresol	534-52-1	1	0.10	50	NA	0.1	0.5	NYSDEC, 1998
N-Nitrosodiphenylamine	86-30-6	3.3	1.0	10	NA	1.0	5.0	USEPA, 2009
4-Bromophenyl phenyl ether	101-55-3	1.5	2.0	10	NA	0.5	10	Suter and Tsao, 1996
Hexachlorobenzene **(see note 1)**	118-74-1	0.00003	0.002	10	NA	0.002	0.010	NYSDEC, 1998
Atrazine **(see note 1)**	1912-24-9	0.26	0.021	NA	NA	0.021	0.105	USEPA, 2013
Pentachlorophenol **(see note 1)**	87-86-5	0.035	0.021	50	NA	0.021	0.105	USEPA, 2013
Phenanthrene	85-01-8	1.5	3.0	10	NA	0.5	15	USEPA Region 2, 2010
Anthracene	120-12-7	20.73	2.0	10	NA	2.0	10	USEPA, 2003
Carbazole	86-74-8	Not Available	2.0	NA	NA	2.0	10	--
Dibutyl phthalate	84-74-2	3.4	3.0	10	NA	3.0	15	USEPA Region 3, 2006
Fluoranthene	206-44-0	7.109	2.0	10	NA	2.0	10	USEPA, 2003
Pyrene	129-00-0	10.11	2.0	10	NA	2.0	10	USEPA, 2003
Butyl benzyl phthalate	85-68-7	3.4	2.0	10	NA	2.0	10	Buchman, 2008
3,3`-Dichlorobenzidine **(see note 1)**	91-94-1	0.011	0.002	20	NA	0.002	0.010	USEPA, 2013
Benzo(a)Anthracene **(see note 1)**	56-55-3	0.002	0.021	10	NA	0.021	0.105	NYSDEC, 1998
Chrysene **(see note 1)**	218-01-9	0.002	0.021	10	NA	0.021	0.105	NYSDEC, 1998
Bis(2-ethylhexyl)phthalate	117-81-7	1.2	0.020	NA	NA	0.020	0.100	USEPA, 2009
Di-n-octyl phthalate	117-84-0	3.4	3.0	10	NA	3.0	15	Buchman, 2008
Benzo(b)fluoranthene **(see note 1)**	205-99-2	0.002	2.0	10	NA	2.0	10	NYSDEC, 1998
Benzo(k)fluoranthene **(see note 1)**	207-08-9	0.002	2.0	50	NA	2.0	10	NYSDEC, 1998
Benzo(a)pyrene **(see note 2)**	50-32-8	0.0006	2.0	10	NA	2.0	10	NYSDEC, 1998
Indeno(1,2,3-cd)pyrene **(see note 1)**	193-39-5	0.002	3.0	50	NA	3.0	15	NYSDEC, 1998
Dibenzo(a,h)Anthracene **(see note 2)**	53-70-3	0.0029	0.001	10	NA	0.001	0.005	USEPA, 2013
Benzo(g,h,i)perylene	191-24-2	0.4391	2.0	10	NA	0.1	10	USEPA, 2003

Note 1- Lab will achieve the PALs by programming run using SCAN & SIM modes on the GCMS, similar runs with past samples at CORCO in this manner permitted the lab to reach and/or exceed similar project action limit.

Note 2- After performing the SIM mode run as presented in note 2, the MCL value presented as the project action limit may still not be achievable, additional optimization may still be needed but no guarantees can be made.

Note 3: The analytes herein are not routinely asked to be detected at the level observed in the PAL, however, using SIM mode for lower the level of detection experienced in similar requests have shown that the PAL will be reached or exceeded as seen in the MDL presented.

Note 4: It is herein advised that this analyte will be detected in the manner noted in "note 1" however, the detction level required in the PAL may not be achievable even when detection is performed using SIM mode on the GCMS. The value reported may be as low as it can get. Never the less, every effort will be made to achieve the PAL presented.

References:

Buchman, 2008. Screening Quick Reference Table (SQuiRT). NOAA OR&R Report 08-1.

NYSDEC, 1998. New York State Department of Environmental Conservation. Division of Water Technical and Operational Guidance (TOGS) Series (1.1.1).

ODEQ, 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV (Level II Screening Level Values). April 1998.

Suter and Tsao, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota. ES/ER/TM-96/R2. June 1996.

USEPA, 2011. USEPA Regional Screening Levels (RSLs). June 2011. Selected screening levels are Tap Water (Tap.) or Maximum Contaminant Level (MCLs) for drinking water values.

USEPA Region 2, 2010. New York Freshwater and Marine Screening Benchmarks.

USEPA, 2009. USEPA National Recommended Ambient Water Quality Criteria (AWQC), 2009.

USEPA Region 3, 2006. USEPA Region 3 Biological Technical Assistance Group (BTAG) Screening Benchmarks. Marine Benchmarks. Mid Atlantic Risk Assessment, July 2006.

USEPA, 2003. EPA Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. EPA -600-R-02-013.

USEPA Region 4, 2001. Supplemental Guidance to RAGS: Region 4 Bulletins, Ecological Risk Assessment. Originally published November 1995. Website version last updated November 30, 2001.

USEPA, 2013. EPA Regional Human Health Screening Levels (RSLs). May 2013. Tapwater RSLs.

Appendix E
Table 14
Metals Surface water Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (ug/L)	Analytical Method		Achievable Laboratory Limits		References
				MDLs (ug/L)	Method QLs (ug/L)	MDLs (ug/L)	QLs (ug/L)	
Arsenic **(note 1)**	7440-38-2	0.018	0.03	1.0	NA	0.03	0.15	USEPA, 2009
Barium	7440-39-3	4	0.20	1.0	NA	0.20	1.0	Suter and Tsao, 1996
Cadmium	7440-43-9	2.7	0.20	1.0	NA	0.20	1.0	NYSDEC, 1998
Chromium **(note 1)**	7440-47-3	0.031	0.03	1.0	NA	0.03	0.15	USEPA, 2013
Lead	7439-92-1	8	0.20	1.0	NA	0.20	1.0	USEPA Region 2, 2010
Mercury **(see note 2)**	7439-97-6	0.0007	0.05	0.017	NA	0.05	0.25	NYSDEC, 1998
Selenium	7782-49-2	10	0.40	1.0	NA	0.40	2.0	NYSDEC, 1998
Silver	7440-22-4	71	0.20	1.0	NA	0.20	1.0	USEPA, 2013

Note 1- Requires a concentration step in the sample prep procedure.

Note 2: Assuming the units herein are ug/L, the level of detection in mercury required by this PAL is in tenths of parts per trillion, at this level of detection you will need to perform the test in a class 100 or better cleanroom performing method modifications, as well as collecting the sample using clean techniques with personnel trained in this collection. Dr. Nicholas Bloom's laboratory in Washington state performs this test, however the environment you will be collecting in will have enough contamination that may render the results useless. The MDL presented herein 0.020ug/L is achievable at Beckton.

References:

NYSDEC, 1998. New York State Department of Environmental Conservation. Division of Water Technical and Operational Guidance (TOGS) Series (1.1.1).
Suter and Tsao, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota. ES/ER/TM-96/R2. June 1996.
USEPA Region 2, 2010. New York Freshwater and Marine Screening Benchmarks.
USEPA, 2009. USEPA National Recommended Ambient Water Quality Criteria (AWQC), 2009.
USEPA, 2013. EPA Regional Human Health Screening Levels (RSLs). May 2013. Tapwater RSLs.

Appendix E
Table 15
EPH/VPH Surface water Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (applicable units)	Analytical Method		Achievable Laboratory Limits		References
				MDLs	Method QLs	MDLs	QLs	
Volatile Petroleum Hydrocarbons (VPH)	CASID30181							
C_5 – C_8 Aliphatic		250	50	4.80	150	10.0	50.0	Mass, 2002
C_9 – C_{12} Aliphatic		1800	5	0.44	150	1.0	5.0	Mass, 2002
C_9 – C_{10} Aromatic		540	50	4.77	150	10.0	50.0	Mass, 2002
Extractable Petroleum Hydrocarbons (EPH)	CASID30102							
C9 – C18 Aliphatic		1800	25	0.102	100	5	25	Mass, 2002
C19 – C36 Aliphatic		2100	25	0..375	100	5	25	Mass, 2002
C11 – C22 Aromatic		Not available	25	0.680	100	5	25	Mass, 2002

Notes:
Total reported by Carbon group, will not measure Individual Targets.

Reference:
Mass, 2002.Commonwealth of Massachusetts Executive Office of Environmental Affairs, Department of Environmental Protection, *Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of the MADEP VPH/EPH Approach*, October 31, 2002, Policy #WSC-02-411.

Appendix E
Table 16
TPH Surface water Quantitation Limits

Analyte*	CAS Number	Protection Action Limit (ug/L)	Project Quantitation Limit (applicable units)	Analytical Method		Achievable Laboratory Limits		References
				MDLs	Method QLs	MDLs	QLs	
Total Petroleum Hydrocarbons (EPH)	NA	Not Available		1400	5,000	1,200	5,000	--

Notes:
Total value without silica gel treatment (will include polar and non-polar materials extractable in Hexane.

NA= Not Available in the method.

Note 1- Lab will achieve the PALs by programming run using SCAN & SIM modes on the GCMS, similar runs with past samples at CORCO in this manner permitted the lab to reach and/or exceed similar project action limit.

Note 2- After performing the SIM mode run as presented in note 2, the MCL value presented as the project action limit may still not be achievable, additional optimization may still be needed but no guarantees can be made.

Note 3- Arochlor 1016 is historically the least sensitive of the PCB Arochlors presented in worksheet #15, experience has also demonstrated that it is a 10 fold factor less sensitive than the rest.

Note 4-The MDLs & QLs specified herein for the soil matrix of the arochlors is an expected value based on modifying the extraction volume and maybe even the instrument, using an MSD in SIM mode instead of an ECD detector. The PALs are extremely low for a soil matrix, the typical MDL of water is 0.065 ug/L, and here we're required to reach 0.069 ug/kg for soil (similar in magnitude), where in water we would extract 1000 ml of water, in soil we extract only 25-30 gms.

Note 5- Requires a concentration step in the sample prep procedure.