US EPA RECORDS CENTER REGION 5
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Prepared for:
AK Steel Corporation
West Chester, Ohio

Baseline Human Health Risk Assessment for the Former Armco Hamilton Plant Site, 401 Augspurger Road, New Miami, Ohio

Revised

Volume II of IV
Appendix A through E

ENSR Corporation
November 2008
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ENSR | AECOM

Appendix A

Appendix A

Analytical Data

Appendix B

Appendix B
Summary Statistics and Screening Tables

TABLE B-1a
COPC SCREENING - SURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
AOC 1													
1,1-Biphenyl	92-52-4	mg/kg	6 : 6 : 17	35	5.68E-02	4.10E-02	1.10E-01	MW-16S	No	3.01E+02	No	No	</=PRG
1,2,4-Trichlorobenzen	120-82-1	mg/kg	1 : 1 : 18	6	1.50E-03	1.50E-03	1.50E-03	AOC1CA8SB3	No	6.22E+00	No	No	</=PRG
1,2-Dichlorobenzene	95-50-1	mg/kg	1 : 1 : 18	6	4.00E-04	4.00E-04	4.00E-04	AOC1CA8SB3	No	1.10E+02	No	No	</=PRG
2,4-Dimethylphenol	105-67-9	mg/kg	1 : 1 : 17	6	5.70E-02	5.70E-02	5.70E-02	AOC1CA4	No	1.22E+02	No	No	</=PRG
2-Butanone	78-93-3	mg/kg	4 : 18 : 18	22	6.04E-03	2.80E-03	1.80E-02	AOC1CA10SB3	No	2.23E+03	No	No	</=PRG
2-Hexanone	591-78-6	mg/kg	2 : 2 : 18	11	1.65E-03	1.60E-03	1.70E-03	AOC1CA8SB3	No	5.28E+02	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	13 : 16 : 17	76	1.88E-01	7.10E-02	3.40E-01	AOC1CA4	No	5.59E+00	No	No	</=PRG
Acenaphthene	83-32-9	mg/kg	2 : 2 : 17	12	9.40E-02	4.80E-02	1.40E-01	MW-12S	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	13 : 16 : 17	76	1.81E-01	3.80E-02	9.10E-01	MW-12S	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	15 : 18 : 18	83	2.71E-02	5.30E-03	5.60E-02	AOC1CA10SB3	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	17 : 17 : 17	100	1.66E+04	4.90E+03	3.22E+04	MW-11S	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	13 : 16 : 17	76	2.49E-01	9.30E-02	9.30E-01	MW-12S	No	2.19E+03	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	14 : 17 : 17	82	8.65E+00	5.40E+00	1.80E+01	AOC1CA11	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	17 : 17 : 17	100	1.55E+02	6.21E+01	3.00E+02	MW-11S	No	5.37E+02	No	No	</=PRG
Benzaldehyde	100-52-7	mg/kg	3 : 15 : 17	18	9.16E-01	3.80E-02	1.70E+00	MW-12S	No	6.11E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	15 : 18 : 18	83	2.73E-03	2.90E-04	2.10E-02	AOC1CA2SB5	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	15 : 16 : 17	88	5.00E-01	1.10E-01	1.30E+00	OC1CA11, MW-12	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	15 : 16 : 17	88	5.09E-01	1.20E-01	1.40E+00	MW-12S	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	16 : 16 : 17	94	5.36E-01	5.20E-02	1.40E+00	MW-12S	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	16 : 16 : 17	94	4.29E-01	5.50E-02	1.00E+00	MW-12S	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	16 : 16 : 17	94	4.55E-01	5.60E-02	1.30E+00	MW-12S	No	6.21E+00	No	No	</=PRG
Beryllium	7440-41-7	mg/kg	17 : 17 : 17	100	2.74E+00	1.16E+00	7.30E+00	MW-11S	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phthal	117-81-7	mg/kg	3 : 3 : 17	18	8.00E-02	4.50E-02	1.50E-01	MW-12S	No	3.47E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	15 : 17 : 17	88	2.57E+00	6.10E-01	1.01E+01	MW-16S	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	17 : 17 : 17	100	1.07E+05	2.40E+04	2.17E+05	MW-11S	Yes	NA	--	No	EN
Carbazole	86-74-8	mg/kg	10 : 16 : 17	59	1.28E-01	4.00E-02	2.40E-01	MW-12S	No	2.43E+01	No	No	</=PRG
Carbon disulfide	75-15-0	mg/kg	10 : 18 : 18	56	6.49E-03	3.40E-04	3.60E-02	AOC1CA2SB5	No	3.55E+01	No	No	</=PRG
Chloromethane	74-87-3	mg/kg	1 : 1 : 18	6	4.80E-04	4.80E-04	4.80E-04	MW-17S	No	4.69E+00	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	17 : 17 : 17	100	3.99E+01	7.40E+00	8.66E+01	AOC1CA8	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	16 : 16 : 17	94	6.20E-01	5.00E-02	1.70E+00	MW-12S	No	6.21E+01	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	9 : 17 : 17	53	5.31E+00	4.50E+00	1.45E+01	MW-16S	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	17 : 17 : 17	100	3.25E+01	8.60E+00	9.37E+01	AOC1CA8	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	11 : 17 : 17	65	2.44E+00	8.55E-01	1.08E+01	AOC1CA9	No	1.22E+02	No	No	</=PRG

TABLE B-1a
COPC SCREENING - SURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

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Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Cyclohexane	110-82-7	mg/kg	13 : 18 : 18	72	1.74E-03	3.30E-04	4.10E-03	AOC1CA2SB5	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	14 : 16 : 17	82	1.59E-01	7.10E-02	3.50E-01	MW-12S	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	12 : 16 : 17	71	1.28E-01	5.60E-02	2.50E-01	AOC1CA11	No	1.45E+01	No	No	</=PRG
Dioxin TEQ-HH	Dioxin TEQ-	mg/kg	5 : 5 : 5	100	2.19E-06	1.42E-07	3.87E-06	AOC1CA3	No	3.90E-06	No	No	</=PRG
Ethylbenzene	100-41-4	mg/kg	9 : 14 : 18	50	1.55E-03	3.10E-04	2.70E-03	AOC1CA2SB5	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	16 : 16 : 17	94	8.03E-01	5.90E-02	3.00E+00	AOC1CA11	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	8 : 15 : 17	47	1.45E-01	4.10E-02	3.40E-01	AOC1CA11	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	16 : 16 : 17	94	3.46E-01	4.20E-02	9.00E-01	MW-12S	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	17 : 17 : 17	100	9.01E+04	1.44E+04	1.90E+05	AOC1CA8	No	2.35E+03	Yes	Yes	>PRG
Isopropylbenzene	98-82-8	mg/kg	3 : 17 : 18	17	2.49E-03	5.00E-04	4.20E-03	AOC1CA8SB3	No	1.57E+01	No	No	</=PRG
Lead	7439-92-1	mg/kg	17 : 17 : 17	100	2.92E+02	4.50E+00	3.43E+03	AOC1CA9	No	4.00E+02	Yes	Yes	>PRG
Magnesium	7439-95-4	mg/kg	17 : 17 : 17	100	2.38E+04	5.87E+03	4.64E+04	MW-11S	Yes	NA	–	No	EN
Manganese	7439-96-5	mg/kg	17 : 17 : 17	100	2.97E+03	7.17E+02	5.23E+03	MW-16S	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	9 : 17 : 17	53	5.29E-02	3.00E-02	1.90E-01	AOC1CA11	No	2.30E+00	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	13 : 17 : 18	72	1.69E-03	5.20E-04	3.30E-03	AOC1CA8SB3	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	5 : 5 : 18	28	7.22E-04	3.60E-04	1.10E-03	AOC1CA2SB5	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	13 : 16 : 17	76	3.25E-01	5.90E-02	2.20E+00	MW-16S	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	17 : 17 : 17	100	1.90E+01	5.00E+00	3.87E+01	AOC1CA8	No	1.56E+02	No	No	</=PRG
p-Cresol (4-Methylphe	106-44-5	mg/kg	2 : 2 : 17	12	1.19E-01	6.80E-02	1.70E-01	MW-12S	No	3.06E+01	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	14 : 16 : 17	82	7.21E-01	6.15E-02	2.50E+00	AOC1CA11	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	17 : 17 : 17	100	1.59E+03	4.40E+02	2.47E+03	AOC1CA13	Yes	NA	–	No	EN
Pyrene	129-00-0	mg/kg	16 : 16 : 17	94	7.23E-01	5.40E-02	2.40E+00	AOC1CA11	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	8 : 16 : 17	47	3.46E+00	2.90E+00	6.90E+00	AOC1CA9	No	3.91E+01	No	No	</=PRG
Silver	7440-22-4	mg/kg	5 : 17 : 17	29	1.55E+00	1.50E+00	4.70E+00	AOC1CA8	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	17 : 17 : 17	100	5.65E+02	1.40E+02	1.26E+03	MW-11S	Yes	NA	–	No	EN
Tetrachloroethene	127-18-4	mg/kg	1 : 1 : 18	6	3.90E-04	3.90E-04	3.90E-04	MW-17S	No	4.84E-01	No	No	</=PRG
Toluene	108-88-3	mg/kg	15 : 18 : 18	83	2.10E-03	2.70E-04	1.20E-02	AOC1CA2SB5	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	12 : 17 : 17	71	6.76E+00	7.30E-02	1.10E+02	AOC1CA9	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	6 : 6 : 18	33	1.61E-03	5.00E-04	2.50E-03	AOC1CA2SB5	No	2.71E+01	No	No	</=PRG
Trichloroethene	79-01-6	mg/kg	1 : 1 : 18	6	4.30E-04	4.30E-04	4.30E-04	MW-17S	No	5.30E-02	No	No	</=PRG
Trichlorofluoromethane	75-69-4	mg/kg	1 : 1 : 18	6	6.50E-04	6.50E-04	6.50E-04	MW-17S	No	3.86E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	17 : 17 : 17	100	2.97E+01	7.10E+00	4.79E+01	MW-16S	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	17 : 17 : 17	100	7.08E+02	1.37E+01	4.61E+03	AOC1CA9	No	2.35E+03	Yes	Yes	>PRG

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NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

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Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
AOC 18 and AOC 21													
2-Butanone	78-93-3	mg/kg	1 : 13 : 14	7	5.26E-03	6.00E-03	6.00E-03	AOC21SB12	No	2.23E+03	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	2 : 20 : 20	10	3.40E-01	8.80E-01	2.40E+00	AOC18SB3	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	7 : 14 : 14	50	3.76E-02	3.20E-03	9.50E-02	AOC21SB12	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	20 : 20 : 20	100	2.13E+04	3.81E+03	5.01E+04	AOC18SB2	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	2 : 20 : 20	10	2.50E-01	5.90E-01	8.80E-01	AOC18SB3	No	2.19E+03	No	No	</=PRG
Antimony	7440-36-0	mg/kg	3 : 3 : 20	15	4.61E-01	3.22E-01	5.57E-01	AOC21SB1	No	3.13E+00	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	19 : 20 : 20	95	7.75E+00	3.00E+00	1.84E+01	AOC21SB1	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	20 : 20 : 20	100	1.45E+02	2.36E+01	3.99E+02	AOC18SB2	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	4 : 20 : 20	20	2.38E-03	6.50E-04	3.50E-03	AOC18SB2	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	6 : 20 : 20	30	6.14E-01	1.50E-02	7.50E+00	AOC18SB3	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	4 : 20 : 20	20	5.93E-01	4.70E-02	6.60E+00	AOC18SB3	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	5 : 20 : 20	25	6.48E-01	4.00E-02	7.40E+00	AOC18SB3	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	5 : 20 : 20	25	5.85E-01	3.70E-02	5.90E+00	AOC18SB3	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	5 : 20 : 20	25	6.49E-01	3.20E-02	7.70E+00	AOC18SB3	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	15 : 20 : 20	75	1.81E+00	5.47E-01	8.20E+00	AOC18SB4	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phthal	117-81-7	mg/kg	1 : 1 : 14	7	4.00E-02	4.00E-02	4.00E-02	AOC21SB10	No	3.47E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	9 : 20 : 20	45	4.85E-01	2.55E-01	1.70E+00	AOC18SB1	No	3.70E+00	No	No	</=PRG
Calcium	7440-70-2	mg/kg	20 : 20 : 20	100	7.63E+04	1.78E+03	2.72E+05	AOC18SB3	Yes	NA	–	No	EN
Carbon disulfide	75-15-0	mg/kg	4 : 4 : 14	29	1.24E-03	4.40E-04	3.30E-03	AOC21SB10	No	3.55E+01	No	No	</=PRG
Chloroform	67-66-3	mg/kg	1 : 1 : 14	7	1.40E-03	1.40E-03	1.40E-03	AOC21SB1	No	2.21E-01	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	20 : 20 : 20	100	2.24E+01	6.90E+00	5.10E+01	AOC18SB5	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	8 : 20 : 20	40	7.06E-01	3.20E-02	9.10E+00	AOC18SB3	No	6.21E+01	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	14 : 20 : 20	70	7.72E+00	5.90E+00	1.35E+01	AOC21SB1	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	16 : 20 : 20	80	1.35E+01	4.10E+00	3.41E+01	AOC18SB1	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	3 : 20 : 20	15	9.15E-01	1.58E+00	6.70E+00	AOC18SB1	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	2 : 5 : 14	14	2.07E-03	4.80E-04	2.70E-03	AOC21SB10	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	3 : 20 : 20	15	2.96E-01	5.10E-02	1.90E+00	AOC18SB3	No	6.21E-02	Yes	Yes	>PRG
Dioxin TEQ-HH	Dioxin TEQ-	mg/kg	7 : 7 : 7	100	2.44E-07	5.18E-08	6.39E-07	AOC18SB5	No	3.90E-06	No	No	</=PRG
Ethylbenzene	100-41-4	mg/kg	3 : 3 : 20	15	8.03E-04	4.70E-04	1.40E-03	AOC18SB2	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	9 : 20 : 20	45	8.58E-01	3.20E-02	1.10E+01	AOC18SB3	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	1 : 1 : 20	5	1.60E-01	1.60E-01	1.60E-01	AOC18SB1	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	3 : 20 : 20	15	5.53E-01	1.30E-01	5.40E+00	AOC18SB3	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	20 : 20 : 20	100	2.26E+04	6.35E+03	4.77E+04	AOC18SB1	No	2.35E+03	Yes	Yes	>PRG

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AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

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Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Lead	7439-92-1	mg/kg	18 : 20 : 20	90	1.63E+01	3.60E+00	9.35E+01	AOC18SB1	No	4.00E+02	No	No	</=PRG
Magnesium	7439-95-4	mg/kg	20 : 20 : 20	100	1.88E+04	1.79E+03	4.69E+04	AOC18SB1	Yes	NA	–	No	EN
Manganese	7439-96-5	mg/kg	20 : 20 : 20	100	2.11E+03	3.32E+02	7.57E+03	AOC18SB3	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	3 : 20 : 20	15	2.40E-02	2.60E-02	1.60E-01	AOC18SB1	No	2.30E+00	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	3 : 5 : 14	21	1.91E-03	3.90E-04	4.00E-03	AOC21SB10	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	2 : 2 : 14	14	5.95E-04	3.10E-04	8.80E-04	MW-15S	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	2 : 19 : 20	10	2.04E-01	6.50E-02	4.90E-01	AOC18SB1	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	18 : 20 : 20	90	1.35E+01	4.60E+00	3.65E+01	AOC21SB1	No	1.56E+02	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	7 : 20 : 20	35	4.12E-01	2.00E-02	3.50E+00	AOC18SB3	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	18 : 20 : 20	90	1.56E+03	5.44E+02	2.91E+03	AOC21SB1	Yes	NA	–	No	EN
Pyrene	129-00-0	mg/kg	9 : 20 : 20	45	9.69E-01	3.10E-02	1.40E+01	AOC18SB3	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	12 : 20 : 20	60	2.57E+00	1.10E+00	7.70E+00	AOC18SB2	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	17 : 20 : 20	85	4.49E+02	2.46E+01	1.94E+03	AOC18SB4	Yes	NA	–	No	EN
Thallium	7440-28-0	mg/kg	4 : 9 : 20	20	6.23E-01	2.58E-01	1.14E+00	AOC21SB1	No	5.16E-01	Yes	Yes	>PRG
Toluene	108-88-3	mg/kg	5 : 20 : 20	25	2.34E-03	6.10E-04	3.50E-03	AOC18SB2	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	2 : 20 : 20	10	1.05E-01	9.45E-02	1.30E+00	AOC18SB1	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	3 : 20 : 20	15	4.08E-03	9.80E-04	7.14E-03	AOC18SB6	No	2.71E+01	No	No	</=PRG
Trichlorofluoromethane	75-69-4	mg/kg	1 : 1 : 14	7	6.70E-04	6.70E-04	6.70E-04	MW-15S	No	3.86E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	19 : 20 : 20	95	3.05E+01	1.22E+01	6.31E+01	AOC21SB1	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	20 : 20 : 20	100	8.39E+01	5.40E+00	3.88E+02	AOC18SB1	No	2.35E+03	No	No	</=PRG

TABLE B-1a
COPC SCREENING - SURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI; BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
AOC 19													
Acenaphthene	83-32-9	mg/kg	1 : 13 : 13	8	3.59E-01	1.00E+00	1.00E+00	AOC19SB1	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	6 : 12 : 13	46	1.98E-01	5.90E-02	3.70E-01	AOC19SB9	No	3.68E+02	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	13 : 13 : 13	100	1.18E+04	5.17E+03	2.13E+04	AOC19SB13	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	7 : 13 : 13	54	3.54E-01	6.70E-02	2.15E+00	AOC19SB1	No	2.19E+03	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	13 : 13 : 13	100	1.79E+01	5.15E+00	1.01E+02	AOC19SB8	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	13 : 13 : 13	100	1.13E+02	4.93E+01	2.87E+02	AOC19SB9	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	6 : 6 : 13	46	1.03E-03	3.90E-04	2.20E-03	AOC19SB11	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	8 : 13 : 13	62	7.70E-01	8.90E-02	4.25E+00	AOC19SB1	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	8 : 13 : 13	62	7.00E-01	9.20E-02	3.05E+00	AOC19SB1	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	7 : 13 : 13	54	6.59E-01	8.70E-02	2.95E+00	AOC19SB1	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	6 : 13 : 13	46	4.85E-01	7.00E-02	1.70E+00	AOC19SB9	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	8 : 13 : 13	62	6.84E-01	1.00E-01	3.00E+00	AOC19SB1	No	6.21E+00	No	No	</=PRG
Beryllium	7440-41-7	mg/kg	12 : 13 : 13	92	9.49E-01	5.70E-01	1.45E+00	AOC19SB1	No	1.54E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	5 : 13 : 13	38	1.04E+00	4.55E-01	7.40E+00	AOC19SB9	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	13 : 13 : 13	100	4.05E+04	2.12E+03	9.25E+04	AOC19SB2	Yes	NA	–	No	EN
Chromium (total)	7440-47-3	mg/kg	13 : 13 : 13	100	2.12E+01	1.38E+01	3.42E+01	AOC19SB9	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	8 : 13 : 13	62	7.98E-01	1.20E-01	4.15E+00	AOC19SB1	No	6.21E+01	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	11 : 13 : 13	85	7.63E+00	5.50E+00	1.08E+01	AOC19SB13	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	13 : 13 : 13	100	6.94E+01	1.43E+01	5.40E+02	AOC19SB9	No	3.13E+02	Yes	Yes	>PRG
CYANIDE	57-12-5	mg/kg	1 : 13 : 13	8	1.42E+00	1.12E+01	1.12E+01	AOC19SB11	No	1.22E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	3 : 13 : 13	23	2.72E-01	1.00E-01	5.70E-01	AOC19SB1	No	6.21E-02	Yes	Yes	>PRG
Dioxin TEQ-HH	Dioxin TEQ-	mg/kg	5 : 7 : 7	71	3.16E-06	3.14E-07	8.83E-06	AOC19SB1	No	3.90E-06	Yes	Yes	>PRG
Ethylbenzene	100-41-4	mg/kg	3 : 3 : 13	23	5.47E-04	4.20E-04	6.50E-04	AOC19SB13	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	12 : 13 : 13	92	1.46E+00	1.40E-01	9.10E+00	AOC19SB1	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	4 : 13 : 13	31	3.29E-01	6.50E-02	9.50E-01	AOC19SB1	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	6 : 13 : 13	46	4.52E-01	6.30E-02	1.50E+00	AOC19SB9	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	13 : 13 : 13	100	2.18E+04	1.27E+04	3.73E+04	AOC19SB13	No	2.35E+03	Yes	Yes	>PRG
Lead	7439-92-1	mg/kg	13 : 13 : 13	100	6.04E+01	1.25E+01	4.35E+02	AOC19SB9	No	4.00E+02	Yes	Yes	>PRG
Magnesium	7439-95-4	mg/kg	13 : 13 : 13	100	1.87E+04	2.00E+03	3.61E+04	AOC19SB9	Yes	NA	–	No	EN
Manganese	7439-96-5	mg/kg	13 : 13 : 13	100	7.48E+02	3.30E+02	1.12E+03	AOC19SB1	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	10 : 13 : 13	77	3.33E-01	4.00E-02	2.70E+00	AOC19SB11	No	2.30E+00	Yes	Yes	>PRG
Naphthalene	91-20-3	mg/kg	6 : 12 : 13	46	3.10E-01	6.30E-02	8.90E-01	AOC19SB12	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	13 : 13 : 13	100	1.69E+01	1.01E+01	2.84E+01	AOC19SB9	No	1.56E+02	No	No	</=PRG

TABLE B-1a
COPC SCREENING - SURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Phenanthrene	85-01-8	mg/kg	11 : 13 : 13	85	1.05E+00	9.30E-02	8.10E+00	AOC19SB1	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	11 : 13 : 13	85	1.60E+03	1.00E+03	2.82E+03	AOC19SB1	Yes	NA	--	No	EN
Pyrene	129-00-0	mg/kg	12 : 13 : 13	92	1.34E+00	1.30E-01	8.60E+00	AOC19SB1	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	7 : 13 : 13	54	2.25E+00	1.33E+00	4.60E+00	AOC19SB5	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	11 : 13 : 13	85	1.43E+02	5.96E+01	5.06E+02	AOC19SB2	Yes	NA	--	No	EN
Toluene	108-88-3	mg/kg	10 : 10 : 13	77	8.61E-04	4.00E-04	2.20E-03	AOC19SB11	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	1 : 13 : 13	8	5.10E-02	1.84E-01	1.84E-01	AOC19SB10	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	2 : 2 : 13	15	1.14E-03	8.90E-04	1.38E-03	AOC19SB11	No	2.71E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	13 : 13 : 13	100	3.08E+01	1.74E+01	5.62E+01	AOC19SB13	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	13 : 13 : 13	100	1.52E+02	4.24E+01	9.42E+02	AOC19SB9	No	2.35E+03	No	No	</=PRG

TABLE B-1a
COPC SCREENING - SURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
AOC 2 - RA													
1,1-Biphenyl	92-52-4	mg/kg	1 : 10 : 10	10	2.06E-01	2.90E-01	2.90E-01	AOC2SB2	No	3.01E+02	No	No	</=PRG
1,2-Dichlorobenzene	95-50-1	mg/kg	1 : 1 : 10	10	1.50E-03	1.50E-03	1.50E-03	AOC2SB1	No	1.10E+02	No	No	</=PRG
1,3-Dichlorobenzene	541-73-1	mg/kg	1 : 1 : 10	10	1.80E-03	1.80E-03	1.80E-03	AOC2SB1	No	5.31E+01	No	No	</=PRG
1,4-Dichlorobenzene	106-46-7	mg/kg	1 : 5 : 10	10	2.47E-03	2.50E-03	2.50E-03	AOC2SB1	No	3.45E+00	No	No	</=PRG
2-Butanone	78-93-3	mg/kg	3 : 3 : 10	30	2.13E-03	1.60E-03	2.90E-03	AOC2SB4	No	2.23E+03	No	No	</=PRG
2-Hexanone	591-78-6	mg/kg	1 : 9 : 10	10	6.52E-03	1.60E-02	1.60E-02	AOC2SB2	No	5.28E+02	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	3 : 10 : 10	30	2.02E-01	7.80E-02	3.50E-01	AOC2SB2	No	5.59E+00	No	No	</=PRG
Acenaphthene	83-32-9	mg/kg	1 : 10 : 10	10	2.28E-01	5.00E-01	5.00E-01	AOC2SB4	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	4 : 10 : 10	40	2.45E-01	3.70E-02	1.00E+00	AOC2SB1	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	5 : 5 : 10	50	1.70E-02	3.70E-03	4.80E-02	AOC2SB4	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	10 : 10 : 10	100	1.64E+04	5.11E+03	3.12E+04	AOC2SB5	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	4 : 10 : 10	40	4.31E-01	4.10E-01	1.50E+00	AOC2SB1	No	2.19E+03	No	No	</=PRG
Antimony	7440-36-0	mg/kg	4 : 4 : 10	40	1.27E+00	3.33E-01	3.61E+00	AOC2SB5	No	3.13E+00	Yes	Yes	>PRG
Arsenic	7440-38-2	mg/kg	9 : 10 : 10	90	7.94E+00	5.15E-01	2.37E+01	AOC2SB2	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	10 : 10 : 10	100	1.34E+02	2.70E+01	3.03E+02	AOC2SB5	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	2 : 2 : 10	20	1.50E-03	1.40E-03	1.60E-03	AOC2SB4	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	8 : 10 : 10	80	9.02E-01	5.40E-02	3.80E+00	AOC2SB1	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	7 : 10 : 10	70	1.14E+00	6.80E-02	5.60E+00	AOC2SB1	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	7 : 10 : 10	70	1.50E+00	5.30E-02	9.30E+00	AOC2SB1	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	8 : 10 : 10	80	6.70E-01	6.30E-02	2.80E+00	AOC2SB1	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	8 : 10 : 10	80	6.22E-01	7.20E-02	2.40E+00	AOC2SB1	No	6.21E+00	No	No	</=PRG
Beryllium	7440-41-7	mg/kg	8 : 10 : 10	80	2.33E+00	4.33E-01	6.74E+00	AOC2SB3	No	1.54E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	5 : 10 : 10	50	9.16E-01	1.71E-01	5.64E+00	AOC2SB2	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	10 : 10 : 10	100	9.26E+04	7.70E+03	2.44E+05	AOC2SB5	Yes	NA	--	No	EN
Carbazole	86-74-8	mg/kg	4 : 10 : 10	40	1.95E-01	4.80E-02	3.60E-01	AOC2SB1	No	2.43E+01	No	No	</=PRG
Carbon disulfide	75-15-0	mg/kg	3 : 9 : 10	30	4.97E-03	7.20E-04	1.00E-02	AOC2SB5	No	3.55E+01	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	9 : 10 : 10	90	1.63E+01	1.24E+01	3.32E+01	AOC2SB2	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	7 : 10 : 10	70	1.09E+00	6.70E-02	5.40E+00	AOC2SB1	No	6.21E+01	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	10 : 10 : 10	100	5.16E+00	7.36E-01	9.17E+00	AOC2SB8	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	10 : 10 : 10	100	1.67E+01	4.55E+00	4.91E+01	AOC2SB2	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	9 : 10 : 10	90	1.63E+00	1.25E-01	9.50E+00	AOC2SB2	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	1 : 3 : 10	10	3.33E-03	4.10E-03	4.10E-03	AOC2SB4	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	6 : 10 : 10	60	3.56E-01	3.30E-02	1.40E+00	AOC2SB1	No	6.21E-02	Yes	Yes	>PRG

TABLE B-1a
COPC SCREENING - SURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Dibenzofuran	132-64-9	mg/kg	4 : 10 : 10	40	1.64E-01	3.10E-02	2.50E-01	AOC2SB2	No	1.45E+01	No	No	</=PRG
Dioxin TEQ-HH	Dioxin TEQ-	mg/kg	3 : 3 : 3	100	1.99E-06	2.86E-07	4.75E-06	AOC2SB2	No	3.90E-06	Yes	Yes	>PRG
Ethylbenzene	100-41-4	mg/kg	1 : 1 : 10	10	2.00E-03	2.00E-03	2.00E-03	AOC2SB4	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	7 : 10 : 10	70	1.22E+00	1.20E-01	3.70E+00	AOC2SB4	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	3 : 10 : 10	30	1.86E-01	1.30E-01	2.40E-01	AOC2SB4	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	7 : 10 : 10	70	6.54E-01	5.30E-02	2.80E+00	AOC2SB1	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	10 : 10 : 10	100	4.06E+04	1.03E+04	2.13E+05	AOC2SB2	No	2.35E+03	Yes	Yes	>PRG
Lead	7439-92-1	mg/kg	10 : 10 : 10	100	5.65E+01	1.34E+00	3.36E+02	AOC2SB2	No	4.00E+02	No	No	</=PRG
Magnesium	7439-95-4	mg/kg	10 : 10 : 10	100	3.06E+04	4.19E+03	7.76E+04	AOC2SB5	Yes	NA	--	No	EN
Manganese	7439-96-5	mg/kg	10 : 10 : 10	100	1.66E+03	4.02E+02	3.43E+03	AOC2SB5	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	7 : 10 : 10	70	4.11E-02	1.90E-02	1.17E-01	AOC2SB4	No	2.30E+00	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	1 : 3 : 10	10	3.53E-03	4.70E-03	4.70E-03	AOC2SB4	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	3 : 3 : 10	30	3.93E-04	3.00E-04	4.50E-04	AOC2SB3	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	4 : 10 : 10	40	1.96E-01	9.40E-02	4.10E-01	AOC2SB2	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	10 : 10 : 10	100	1.37E+01	4.72E+00	2.51E+01	AOC2SB2	No	1.56E+02	No	No	</=PRG
p-Cresol (4-Methylphe	106-44-5	mg/kg	1 : 1 : 10	10	3.40E-02	3.40E-02	3.40E-02	AOC2SB1	No	3.06E+01	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	7 : 10 : 10	70	7.46E-01	3.30E-02	2.40E+00	AOC2SB4	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	6 : 10 : 10	60	1.37E+03	7.14E+02	3.13E+03	AOC2SB1	Yes	NA	--	No	EN
Pyrene	129-00-0	mg/kg	8 : 10 : 10	80	1.24E+00	1.10E-01	4.00E+00	AOC2SB1	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	4 : 10 : 10	40	1.56E+00	1.19E+00	5.04E+00	AOC2SB3	No	3.91E+01	No	No	</=PRG
Silver	7440-22-4	mg/kg	1 : 10 : 10	10	2.42E-01	1.03E+00	1.03E+00	AOC2SB2	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	6 : 10 : 10	60	6.49E+02	4.65E+01	2.40E+03	AOC2SB5	Yes	NA	--	No	EN
Thallium	7440-28-0	mg/kg	5 : 10 : 10	50	4.80E-01	3.00E-01	2.47E+00	AOC2SB2	No	5.16E-01	Yes	Yes	>PRG
Toluene	108-88-3	mg/kg	1 : 9 : 10	10	2.86E-03	4.70E-03	4.70E-03	AOC2SB4	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	5 : 10 : 10	50	2.91E-01	2.32E-02	2.70E+00	AOC2SB2	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	1 : 1 : 10	10	4.10E-03	4.10E-03	4.10E-03	AOC2SB4	No	2.71E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	10 : 10 : 10	100	2.47E+01	1.07E+01	4.63E+01	AOC2SB8	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	10 : 10 : 10	100	2.47E+02	7.86E+00	1.39E+03	AOC2SB2	No	2.35E+03	No	No	</=PRG

TABLE B-1a
COPC SCREENING - SURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Block A													
1,2-Dichloroethane	107-06-2	mg/kg	1 : 1 : 19	5	4.60E-04	4.60E-04	4.60E-04	BACA2SB1	No	2.78E-01	No	No	</=PRG
2-Butanone	78-93-3	mg/kg	5 : 18 : 19	26	7.53E-03	3.35E-03	4.10E-02	BACA8SB2	No	2.23E+03	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	3 : 3 : 15	20	6.37E-02	4.30E-02	1.00E-01	BACA6	No	5.59E+00	No	No	</=PRG
4-Methyl-2-pentanone	108-10-1	mg/kg	1 : 1 : 19	5	1.10E-03	1.10E-03	1.10E-03	MW-18S	No	5.28E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	7 : 15 : 15	47	2.81E-01	6.40E-02	2.00E+00	MW-13S	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	14 : 18 : 19	74	1.90E-02	6.40E-03	6.10E-02	BACA8SB1	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	15 : 15 : 15	100	2.89E+04	7.02E+03	3.64E+04	BACA1	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	8 : 15 : 15	53	2.78E-01	5.30E-02	2.00E+00	MW-13S	No	2.19E+03	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	11 : 15 : 15	73	3.11E+00	1.10E+00	9.40E+00	BACA10	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	15 : 15 : 15	100	2.72E+02	1.08E+02	3.89E+02	BACA9	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	13 : 19 : 19	68	1.32E+00	3.90E-04	2.50E+01	BACA7SB4	No	6.43E-01	Yes	Yes	>PRG
Benzo(a)anthracene	56-55-3	mg/kg	13 : 15 : 15	87	4.65E-01	7.40E-02	3.10E+00	MW-13S	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	13 : 15 : 15	87	8.82E-01	8.60E-02	9.10E+00	MW-13S	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	13 : 15 : 15	87	1.03E+00	7.50E-02	1.10E+01	MW-13S	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	13 : 15 : 15	87	8.16E-01	8.60E-02	8.60E+00	MW-13S	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	13 : 15 : 15	87	7.85E-01	8.30E-02	7.70E+00	MW-13S	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	15 : 15 : 15	100	5.16E+00	1.10E+00	8.40E+00	BACA6	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phthal	117-81-7	mg/kg	3 : 3 : 15	20	6.10E-02	4.40E-02	7.00E-02	BACA7	No	3.47E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	10 : 15 : 15	67	2.17E+00	4.58E-01	1.19E+01	BACA13	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	15 : 15 : 15	100	1.89E+05	1.07E+04	2.74E+05	BACA2	Yes	NA	–	No	EN
Carbazole	86-74-8	mg/kg	2 : 14 : 15	13	1.96E-01	9.60E-02	3.50E-01	MW-13S	No	2.43E+01	No	No	</=PRG
Carbon disulfide	75-15-0	mg/kg	16 : 19 : 19	84	6.91E-02	4.70E-04	1.20E+00	BACA7SB4	No	3.55E+01	No	No	</=PRG
Chloromethane	74-87-3	mg/kg	4 : 4 : 19	21	8.49E-04	3.30E-04	1.20E-03	BACA7SB2	No	4.69E+00	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	15 : 15 : 15	100	3.90E+01	9.50E+00	1.70E+02	BACA5	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	13 : 15 : 15	87	6.91E-01	8.90E-02	5.10E+00	MW-13S	No	6.21E+01	No	No	</=PRG
cis-1,2-Dichloroethene	156-59-2	mg/kg	1 : 18 : 19	5	4.44E-03	3.38E-02	3.38E-02	MW-18S	No	4.29E+00	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	4 : 15 : 15	27	5.49E+00	6.40E+00	3.06E+01	BACA13	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	14 : 15 : 15	93	1.64E+01	2.60E+00	4.53E+01	BACA12	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	10 : 15 : 15	67	1.56E+00	1.28E+00	2.86E+00	MW-18S	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	5 : 18 : 19	26	2.59E-03	6.10E-04	7.80E-03	BACA9SB4	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	9 : 15 : 15	60	2.68E-01	4.40E-02	2.00E+00	MW-13S	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	1 : 1 : 15	7	4.60E-02	4.60E-02	4.60E-02	MW-18S	No	1.45E+01	No	No	</=PRG
Dichlorodifluoromethan	75-71-8	mg/kg	1 : 1 : 19	5	6.10E-04	6.10E-04	6.10E-04	BACA3SB2	No	9.39E+00	No	No	</=PRG

TABLE B-1a
COPC SCREENING - SURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Dioxin TEQ-HH	Dioxin TEQ-	mg/kg	6 : 6 : 6	100	2.98E-06	2.56E-07	1.46E-05	MW-13S	No	3.90E-06	Yes	Yes	>PRG
Ethylbenzene	100-41-4	mg/kg	6 : 19 : 19	32	2.95E+00	3.30E-04	5.60E+01	BACA7SB4	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	13 : 15 : 15	87	6.50E-01	1.20E-01	3.50E+00	MW-13S	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	1 : 1 : 15	7	4.60E-02	4.60E-02	4.60E-02	MW-18S	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	13 : 15 : 15	87	6.69E-01	5.80E-02	6.90E+00	MW-13S	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	15 : 15 : 15	100	5.40E+04	8.20E+03	2.32E+05	BACA13	No	2.35E+03	Yes	Yes	>PRG
Isopropylbenzene	98-82-8	mg/kg	2 : 2 : 19	11	3.45E-04	3.40E-04	3.50E-04	BACA2SB1	No	1.57E+01	No	No	</=PRG
Lead	7439-92-1	mg/kg	15 : 15 : 15	100	1.58E+01	2.60E+00	3.43E+01	BACA12	No	4.00E+02	No	No	</=PRG
Magnesium	7439-95-4	mg/kg	15 : 15 : 15	100	4.29E+04	2.50E+03	6.87E+04	BACA7	Yes	NA	--	No	EN
Manganese	7439-96-5	mg/kg	15 : 15 : 15	100	4.73E+03	1.91E+03	7.65E+03	BACA13	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	3 : 15 : 15	20	3.00E-02	6.50E-02	8.00E-02	BACA7	No	2.30E+00	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	8 : 18 : 19	42	2.54E-03	4.10E-04	1.30E-02	BACA9SB4	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	3 : 3 : 19	16	1.16E-03	9.90E-04	1.50E-03	BACA9SB4	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	3 : 3 : 15	20	7.47E-02	4.00E-02	9.80E-02	BACA8	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	8 : 15 : 15	53	7.34E+00	5.20E+00	2.49E+01	BACA5	No	1.56E+02	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	13 : 15 : 15	87	2.35E-01	5.70E-02	7.50E-01	BACA8	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	15 : 15 : 15	100	1.84E+03	6.75E+02	2.38E+03	BACA4	Yes	NA	--	No	EN
Pyrene	129-00-0	mg/kg	13 : 15 : 15	87	7.81E-01	1.10E-01	5.60E+00	MW-13S	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	11 : 13 : 15	73	6.95E+00	2.80E+00	1.06E+01	BACA5	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	15 : 15 : 15	100	1.37E+03	1.17E+02	2.09E+03	BACA3	Yes	NA	--	No	EN
Styrene	100-42-5	mg/kg	1 : 19 : 19	5	6.32E+00	1.20E+02	1.20E+02	BACA7SB4	No	4.40E+02	No	No	</=PRG
Toluene	108-88-3	mg/kg	13 : 19 : 19	68	1.00E+01	3.80E-04	1.90E+02	BACA7SB4	No	6.60E+01	Yes	Yes	>PRG
TOTAL PCBs	Total PCBs	mg/kg	2 : 15 : 15	13	4.55E-02	5.00E-02	1.40E-01	BACA12	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	3 : 19 : 19	16	2.32E+01	3.10E-03	4.40E+02	BACA7SB4	No	2.71E+01	Yes	Yes	>PRG
trans-1,2-Dichloroethe	156-60-5	mg/kg	1 : 1 : 19	5	9.20E-04	9.20E-04	9.20E-04	MW-18S	No	6.95E+00	No	No	</=PRG
Trichloroethene	79-01-6	mg/kg	2 : 2 : 19	11	1.08E-03	4.50E-04	1.70E-03	MW-18S	No	5.30E-02	No	No	</=PRG
Trichlorofluoromethane	75-69-4	mg/kg	3 : 3 : 19	16	4.37E-04	4.10E-04	4.70E-04	MW-18S	No	3.86E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	15 : 15 : 15	100	2.93E+01	1.48E+01	8.52E+01	BACA5	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	14 : 15 : 15	93	3.10E+01	6.20E+00	1.40E+02	BACA8	No	2.35E+03	No	No	</=PRG

TABLE B-1a
COPC SCREENING - SURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason

Notes:
CAS - Chemical Abstracts Service.
COPC - Chemical of potential
EN - Essential nutrient.
FOD - Frequency of detection.
NA - Not available.
USEPA - United States Environmental Protection Agency.
(a) Frequency of Detection = Number of detected samples: Total number of samples.
(b) Percent of detected samples out of samples collected.
(c) Essential nutrients are not included as COPCs (calcium, magnesium, potassium, sodium).
(d) USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for residential soil. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effec
See Table B-6 for detailed references.
(e) A chemical is identified as a COPC if it is not an essential nutrient, has an FOD greater than 5% (where 20 samples are available) and if the maximum detected concentration is greater than the PRG.

TABLE B-1b
COPC SCREENING - SURFACE SOIL (AOC 13 AND SOUTHERN PARCEL)
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
AOC 13													
1,2,4-Trichlorobenzen	120-82-1	mg/kg	1 : 27	4	3.80E-04	3.80E-04	3.80E-04	MW-8S	No	6.22E+00	No	No	</=PRG
1,3-Dichlorobenzene	541-73-1	mg/kg	1 : 27	4	4.10E-04	4.10E-04	4.10E-04	MW-8S	No	5.31E+01	No	No	</=PRG
1,4-Dichlorobenzene	106-46-7	mg/kg	1 : 27	4	3.70E-04	3.70E-04	3.70E-04	MW-8S	No	3.45E+00	No	No	</=PRG
1-METHYLNAPHTHA	90-12-0	mg/kg	4 : 4	100	5.66E-02	3.18E-02	7.08E-02	MW-28S	No	5.59E+00	No	No	</=PRG
2-Butanone	78-93-3	mg/kg	3 : 27	11	4.20E-03	2.40E-03	5.80E-03	AOC13SB5	No	2.23E+03	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	11 : 27	41	7.15E-01	6.00E-02	6.00E+00	MW-20S	No	5.59E+00	Yes	Yes	>PRG
Acenaphthene	83-32-9	mg/kg	8 : 27	30	1.45E+00	1.17E-02	9.80E+00	MW-20S	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	17 : 27	63	2.03E+00	4.00E-02	1.27E+01	MW-20S	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	13 : 27	48	4.02E-02	7.00E-03	1.60E-01	AOC13SB12	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	27 : 27	100	1.22E+04	4.92E+03	3.61E+04	MW-31S	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	20 : 27	74	2.35E+00	4.40E-02	2.20E+01	MW-20S	No	2.19E+03	No	No	</=PRG
Antimony	7440-36-0	mg/kg	5 : 28	18	7.89E-01	5.54E-01	1.10E+00	MW-31S	No	3.13E+00	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	27 : 27	100	7.24E+00	1.78E-01	1.48E+01	MW-25S	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	27 : 27	100	9.69E+01	4.45E+01	3.10E+02	MW-31S	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	17 : 27	63	1.72E-03	3.00E-04	5.40E-03	AOC13SB12	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	25 : 27	93	5.07E+00	6.60E-02	4.55E+01	MW-20S	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	25 : 27	93	4.70E+00	6.80E-02	4.14E+01	MW-20S	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	25 : 27	93	4.16E+00	6.60E-02	3.48E+01	MW-20S	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	25 : 27	93	3.39E+00	4.90E-02	2.72E+01	MW-20S	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	25 : 27	93	4.36E+00	6.60E-02	3.89E+01	MW-20S	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	16 : 27	59	1.62E+00	5.12E-01	4.50E+00	MW-31S	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phtha	117-81-7	mg/kg	3 : 27	11	7.70E-02	6.80E-02	9.20E-02	MW-8S	No	3.47E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	11 : 27	41	1.09E+00	1.44E-01	4.10E+00	AOC13SB7	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	27 : 27	100	8.20E+04	1.02E+04	2.20E+05	MW-31S	Yes	NA	–	No	EN
Carbazole	86-74-8	mg/kg	10 : 27	37	1.43E+00	6.00E-02	7.21E+00	MW-20S	No	2.43E+01	No	No	</=PRG
Carbon disulfide	75-15-0	mg/kg	14 : 27	52	1.08E-03	3.30E-04	3.40E-03	AOC13SB7	No	3.56E+01	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	27 : 27	100	1.73E+01	5.65E+00	2.81E+01	AOC13SB4	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	25 : 27	93	5.05E+00	7.60E-02	4.60E+01	MW-20S	No	6.21E+01	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	12 : 27	44	7.18E+00	4.65E+00	8.80E+00	AOC13SB6	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	27 : 27	100	2.01E+01	2.97E+00	5.66E+01	AOC13SB7	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	4 : 22	18	3.36E+00	1.21E+00	4.85E+00	MW-20S	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	19 : 27	70	2.50E-03	3.20E-04	6.60E-03	MW-8S	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracen	53-70-3	mg/kg	20 : 27	74	1.14E+00	2.81E-02	7.45E+00	MW-20S	No	6.21E-02	Yes	Yes	>PRG

TABLE B-1b
COPC SCREENING - SURFACE SOIL (AOC 13 AND SOUTHERN PARCEL)
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Dibenzofuran	132-64-9	mg/kg	11 : 27	41	1.16E+00	5.50E-02	7.62E+00	MW-20S	No	1.45E+01	No	No	</=PRG
Dichlorodifluorometha	75-71-8	mg/kg	1 : 27	4	6.00E-04	6.00E-04	6.00E-04	MW-8S	No	9.39E+00	No	No	</=PRG
Di-n-octylphthalate	117-84-0	mg/kg	1 : 27	4	4.80E+00	4.80E+00	4.80E+00	AOC13SB1	No	2.44E+02	No	No	</=PRG
Dioxin TEQ-HH	Dioxin TEQ	mg/kg	7 : 7	100	1.36E-06	4.99E-07	3.80E-06	AOC13SB52	No	3.90E-06	No	No	</=PRG
Ethylbenzene	100-41-4	mg/kg	13 : 27	48	1.39E-03	3.50E-04	3.40E-03	AOC13SB1	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	25 : 27	93	1.06E+01	1.20E-01	8.65E+01	MW-20S	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	15 : 27	56	1.63E+00	2.49E-02	1.57E+01	MW-20S	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	25 : 27	93	3.04E+00	4.10E-02	2.42E+01	MW-20S	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	27 : 27	100	2.26E+04	2.20E+03	1.85E+05	AOC13SB7	No	2.35E+03	Yes	Yes	>PRG
Isopropylbenzene	98-82-8	mg/kg	3 : 27	11	4.27E-04	3.50E-04	4.90E-04	AOC13SB1	No	1.57E+01	No	No	</=PRG
Lead	7439-92-1	mg/kg	27 : 27	100	5.40E+01	1.53E+00	4.64E+02	MW-25S	No	4.00E+02	Yes	Yes	>PRG
Magnesium	7439-95-4	mg/kg	27 : 27	100	2.45E+04	6.67E+03	5.38E+04	AOC13SB4	Yes	NA	--	No	EN
Manganese	7439-96-5	mg/kg	27 : 27	100	9.92E+02	3.18E+02	4.20E+03	MW-31S	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	21 : 27	78	4.22E-01	1.57E-02	2.46E+00	AOC13SB1	No	2.30E+00	Yes	Yes	>PRG
Methylcyclohexane	108-87-2	mg/kg	19 : 27	70	4.29E-03	3.40E-04	1.20E-02	C13SB5, AOC13S	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	7 : 27	26	6.59E-04	3.00E-04	2.00E-03	MW-8S	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	19 : 27	70	1.04E+00	5.60E-02	8.79E+00	MW-20S	No	5.59E+00	Yes	Yes	>PRG
Nickel	7440-02-0	mg/kg	27 : 27	100	1.45E+01	4.71E+00	2.71E+01	AOC13SB13	No	1.56E+02	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	25 : 27	93	6.68E+00	6.40E-02	7.75E+01	MW-20S	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	27 : 27	100	1.28E+03	7.58E+02	3.46E+03	MW-31S	Yes	NA	--	No	EN
Pyrene	129-00-0	mg/kg	25 : 27	93	8.55E+00	1.10E-01	7.65E+01	MW-20S	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	9 : 27	33	2.22E+00	4.15E-01	4.05E+00	MW-20S	No	3.91E+01	No	No	</=PRG
Silver	7440-22-4	mg/kg	5 : 27	19	1.72E+00	8.96E-02	5.30E+00	AOC13SB7	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	25 : 27	93	3.32E+02	7.32E+01	2.47E+03	MW-25S	Yes	NA	--	No	EN
Tetrachloroethene	127-18-4	mg/kg	2 : 27	7	4.15E-04	2.90E-04	5.40E-04	MW-8S	No	4.84E-01	No	No	</=PRG
Thallium	7440-28-0	mg/kg	5 : 27	19	1.40E-01	1.41E-02	2.34E-01	MW-25S	No	5.16E-01	No	No	</=PRG
Toluene	108-88-3	mg/kg	19 : 27	70	2.98E-03	4.00E-04	7.50E-03	AOC13SB12	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	16 : 27	59	1.38E+00	5.08E-02	1.22E+01	AOC13SB10	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	15 : 27	56	3.23E-03	8.25E-04	7.10E-03	AOC13SB1	No	2.71E+01	No	No	</=PRG
Trichloroethene	79-01-6	mg/kg	2 : 27	7	8.65E-04	4.00E-04	1.33E-03	MW-31S	No	5.30E-02	No	No	</=PRG
Trichlorofluoromethan	75-69-4	mg/kg	1 : 27	4	3.70E-04	3.70E-04	3.70E-04	MW-8S	No	3.86E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	27 : 27	100	2.24E+01	5.24E+00	4.50E+01	MW-21S	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	27 : 27	100	9.53E+01	4.80E+00	5.08E+02	MW-25S	No	2.35E+03	No	No	</=PRG

S. Exposure Area Rev

TABLE B-1b
COPC SCREENING - SURFACE SOIL (AOC 13 AND SOUTHERN PARCEL)
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
1,1-Biphenyl	92-52-4	mg/kg	5 : 118	4	2.00E-01	3.90E-02	6.30E-01	AOC20CA8	No	3.01E+02	No	No	</=PRG
1,2,4-Trichlorobenzen	120-82-1	mg/kg	3 : 123	2	1.13E-03	8.90E-04	1.50E-03	BBSB6	No	6.22E+00	No	No	</=PRG
1,2-Dichlorobenzene	95-50-1	mg/kg	2 : 123	2	4.10E-04	3.00E-04	5.20E-04	BBSB6	No	1.10E+02	No	No	</=PRG
1,3-Dichlorobenzene	541-73-1	mg/kg	2 : 123	2	4.35E-04	4.00E-04	4.70E-04	BBSB6	No	5.31E+01	No	No	</=PRG
1-METHYLNAPHTHA	90-12-0	mg/kg	5 : 8	63	1.01E-01	3.06E-02	1.92E-01	MW-26S	No	5.59E+00	No	No	</=PRG
2-Butanone	78-93-3	mg/kg	34 : 123	28	6.35E-03	1.60E-03	4.50E-02	AOC20CA12SB2	No	2.23E+03	No	No	</=PRG
2-Hexanone	591-78-6	mg/kg	3 : 123	2	1.40E-03	1.20E-03	1.80E-03	BBSB6	No	5.28E+02	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	54 : 118	46	3.35E-01	1.93E-02	3.20E+00	AOC20CA9	No	5.59E+00	No	No	</=PRG
4-Methyl-2-pentanone	108-10-1	mg/kg	1 : 123	1	6.30E-03	6.30E-03	6.30E-03	BCSB10	No	5.28E+02	No	No	</=PRG
Acenaphthene	83-32-9	mg/kg	20 : 119	17	8.84E-01	1.18E-02	4.50E+00	AOC20CA9	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	74 : 119	62	6.72E-01	1.85E-02	9.00E+00	BCSB12	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	82 : 123	67	2.63E-02	2.90E-03	1.70E-01	C20CA12SB2, BDS	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	121 : 121	100	1.92E+04	4.26E+03	9.02E+04	BCSB5	No	7.81E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	84 : 119	71	9.07E-01	3.57E-02	1.40E+01	BCSB12	No	2.19E+03	No	No	</=PRG
Antimony	7440-36-0	mg/kg	17 : 109	16	1.23E+01	4.83E-01	1.05E+02	BFSB4	No	3.13E+00	Yes	Yes	>PRG
Arsenic	7440-38-2	mg/kg	113 : 121	93	9.28E+00	4.74E-01	3.36E+01	BCSB9	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	121 : 121	100	1.84E+02	4.69E+01	6.89E+02	BCSB5	No	5.37E+02	Yes	Yes	>PRG
Benzene	71-43-2	mg/kg	84 : 124	68	2.67E-03	2.90E-04	8.40E-02	AOC20CA9SB2	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	111 : 119	93	2.07E+00	4.30E-02	3.60E+01	BCSB12	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	112 : 119	94	1.92E+00	4.30E-02	2.70E+01	BCSB12	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	111 : 119	93	1.81E+00	4.00E-02	2.50E+01	BCSB12	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	111 : 119	93	1.52E+00	4.50E-02	1.70E+01	BCSB12	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	110 : 119	92	1.81E+00	4.30E-02	2.70E+01	BCSB12	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	76 : 121	63	3.71E+00	5.90E-01	1.35E+01	BCSB5	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phtha	117-81-7	mg/kg	10 : 118	8	6.97E-01	6.90E-02	5.30E+00	BDSB8	No	3.47E+01	No	No	</=PRG
Butylbenzylphthalate	85-68-7	mg/kg	1 : 118	1	1.50E+00	1.50E+00	1.50E+00	BDSB8	No	1.22E+03	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	77 : 121	64	2.34E+00	2.28E-01	1.08E+01	BCSB5	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	121 : 121	100	1.18E+05	2.45E+03	2.67E+05	AOC14SB3	Yes	NA	--	No	EN
Carbazole	86-74-8	mg/kg	41 : 118	35	4.91E-01	4.30E-02	3.30E+00	BCSB12	No	2.43E+01	No	No	</=PRG
Carbon disulfide	75-15-0	mg/kg	88 : 123	72	3.13E-03	2.90E-04	3.50E-02	AOC12SB3	No	3.55E+01	No	No	</=PRG
Chlorobenzene	108-90-7	mg/kg	2 : 123	2	1.17E-02	4.60E-04	2.30E-02	AOC12SB6	No	1.51E+01	No	No	</=PRG
Chloroform	67-66-3	mg/kg	13 : 123	11	3.96E-04	3.20E-04	5.60E-04	BDSB5	No	2.21E-01	No	No	</=PRG
Chloromethane	74-87-3	mg/kg	11 : 123	9	1.01E-03	4.60E-04	1.50E-03	BBSB4	No	4.69E+00	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	121 : 121	100	7.15E+01	1.14E+01	3.73E+03	BFSB4	No	2.20E+01	Yes	Yes	>PRG

TABLE B-1b
COPC SCREENING - SURFACE SOIL (AOC 13 AND SOUTHERN PARCEL)
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Chrysene	218-01-9	mg/kg	112 : 119	94	2.18E+00	4.30E-02	3.30E+01	BCSB12	No	6.21E+01	No	No	</=PRG
cis-1,2-Dichloroethene	156-59-2	mg/kg	1 : 123	1	3.70E-04	3.70E-04	3.70E-04	AOC14SB4	No	4.29E+00	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	50 : 121	41	8.23E+00	3.64E+00	1.49E+01	AOC8SB4	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	120 : 121	99	6.58E+01	2.59E+00	1.38E+03	AOC15SB1	No	3.13E+02	Yes	Yes	>PRG
CYANIDE	57-12-5	mg/kg	58 : 112	52	3.07E+00	1.12E+00	1.48E+01	BCSB9	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	86 : 123	70	4.07E-03	3.80E-04	1.60E-01	AOC20CA9SB2	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracen	53-70-3	mg/kg	84 : 119	71	5.20E-01	2.63E-02	4.90E+00	BCSB12	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	44 : 118	37	5.20E-01	4.30E-02	5.10E+00	AOC20CA8	No	1.45E+01	No	No	</=PRG
Dichlorodifluorometha	75-71-8	mg/kg	2 : 123	2	5.00E-04	4.20E-04	5.80E-04	MW-1S	No	9.39E+00	No	No	</=PRG
Dioxin TEQ-HH	Dioxin TEQ	mg/kg	43 : 43	100	6.80E-06	9.17E-08	7.20E-05	AOC14SB3	No	3.90E-06	Yes	Yes	>PRG
Ethylbenzene	100-41-4	mg/kg	38 : 124	31	7.63E-03	3.00E-04	2.30E-01	AOC20CA9SB2	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	115 : 119	97	3.82E+00	4.40E-02	7.10E+01	BCSB12	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	40 : 119	34	8.40E-01	1.35E-02	7.90E+00	BCSB12	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	109 : 119	92	1.27E+00	4.80E-02	1.70E+01	BCSB12	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	121 : 121	100	4.58E+04	4.81E+03	1.70E+05	AOC20CA12	No	2.35E+03	Yes	Yes	>PRG
Isopropylbenzene	98-82-8	mg/kg	5 : 123	4	7.36E-02	6.80E-04	3.60E-01	AOC20CA9SB2	No	1.57E+01	No	No	</=PRG
Lead	7439-92-1	mg/kg	119 : 121	98	7.71E+01	1.86E+00	1.33E+03	AOC15SB2	No	4.00E+02	Yes	Yes	>PRG
Magnesium	7439-95-4	mg/kg	121 : 121	100	2.82E+04	2.26E+03	7.48E+04	AOC14SB1	Yes	NA	--	No	EN
Manganese	7439-96-5	mg/kg	121 : 121	100	3.03E+03	3.37E+02	2.07E+04	BCSB13	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	75 : 121	62	4.37E-01	2.71E-02	1.44E+01	BBSB4	No	2.30E+00	Yes	Yes	>PRG
Methyl acetate	79-20-9	mg/kg	2 : 123	2	1.95E-03	1.50E-03	2.40E-03	AOC12SB1	No	2.21E+03	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	93 : 123	76	2.43E-02	3.90E-04	2.00E+00	AOC20CA9SB2	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	45 : 123	37	3.27E-03	2.90E-04	8.70E-02	AOC20CA9SB2	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	62 : 119	52	3.73E-01	1.81E-02	3.40E+00	BCSB12	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	109 : 121	90	1.71E+01	4.80E+00	7.27E+01	MW-6S	No	1.56E+02	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	107 : 119	90	2.57E+00	4.30E-02	5.60E+01	BCSB12	No	2.19E+03	No	No	</=PRG
Phenol	108-95-2	mg/kg	2 : 117	2	1.20E-01	4.00E-02	2.00E-01	MW-1S	No	1.83E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	117 : 121	97	1.60E+03	2.73E+02	3.40E+03	AOC20CA5	Yes	NA	--	No	EN
Pyrene	129-00-0	mg/kg	114 : 119	96	3.20E+00	4.00E-02	5.70E+01	BCSB12	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	59 : 121	49	4.58E+00	9.43E-01	3.89E+01	BFSB4	No	3.91E+01	No	No	</=PRG
Silver	7440-22-4	mg/kg	18 : 121	15	4.23E+00	2.89E-01	3.58E+01	AOC15SB1	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	110 : 121	91	7.48E+02	6.34E+01	6.06E+03	MW-26S	Yes	NA	--	No	EN
Tetrachloroethene	127-18-4	mg/kg	4 : 123	3	1.74E-03	3.80E-04	4.20E-03	AOC20CA6SB1	No	4.84E-01	No	No	</=PRG
Thallium	7440-28-0	mg/kg	6 : 121	5	1.89E-01	7.45E-02	3.98E-01	MW-24S	No	5.16E-01	No	No	</=PRG

TABLE B-1b
COPC SCREENING - SURFACE SOIL (AOC 13 AND SOUTHERN PARCEL)
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Toluene	108-88-3	mg/kg	87 : 124	70	4.27E-03	3.10E-04	2.00E-01	AOC20CA9SB2	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	76 : 118	64	5.96E-01	4.88E-02	7.28E+00	BBSB1	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	42 : 124	34	2.47E-02	5.71E-04	8.60E-01	AOC20CA9SB2	No	2.71E+01	No	No	</=PRG
Trichloroethene	79-01-6	mg/kg	5 : 123	4	6.82E-04	3.60E-04	1.30E-03	BBSB2	No	5.30E-02	No	No	</=PRG
Trichlorofluoromethan	75-69-4	mg/kg	12 : 123	10	8.05E-04	4.20E-04	2.70E-03	BCSB7	No	3.86E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	121 : 121	100	3.32E+01	8.40E+00	4.85E+02	BFSB4	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	119 : 121	98	3.16E+02	4.90E+00	7.24E+03	AOC15SB1	No	2.35E+03	Yes	Yes	>PRG

Notes:
CAS - Chemical Abstracts Service.
COPC - Chemical of potential
EN - Essential nutrient.
FOD - Frequency of detection.
NA - Not available.
USEPA - United States Environmental Protection Agency.
(a) Frequency of Detection = Number of detected samples: Total number of samples.
(b) Percent of detected samples out of samples collected.
(c) Essential nutrients are not included as COPCs (calcium, magnesium, potassium, sodium).
(d) USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for residential soil. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects. See Table B-6 for detailed references.
(e) A chemical is identified as a COPC if it is not an essential nutrient, has an FOD greater than 5% (where 20 samples are available) and if the maximum detected concentration is greater than the PRG.

TABLE B-2a
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
AOC 1													
1,1-Biphenyl	92-52-4	mg/kg	11 : 34 : 34	32	1.35E+00	4.10E-02	2.70E+01	AOC1CA12	No	3.01E+02	No	No	</=PRG
1,2,4-Trichlorobenzen	120-82-1	mg/kg	3 : 3 : 42	7	1.10E-03	5.00E-04	1.50E-03	AOC1CA8SB3	No	8.22E+00	No	No	</=PRG
1,2-Dichlorobenzene	95-50-1	mg/kg	2 : 2 : 42	5	3.70E-04	3.40E-04	4.00E-04	AOC1CA8SB3	No	1.10E+02	No	No	</=PRG
1,3-Dichlorobenzene	541-73-1	mg/kg	1 : 1 : 42	2	3.10E-04	3.10E-04	3.10E-04	AOC1CA2SB3	No	5.31E+01	No	No	</=PRG
2,4-Dimethylphenol	105-67-9	mg/kg	2 : 2 : 34	6	7.70E-02	5.70E-02	9.70E-02	AOC1CA10	No	1.22E+02	No	No	</=PRG
2-Butanone	78-93-3	mg/kg	11 : 39 : 42	26	1.13E-02	2.90E-03	1.40E-01	AOC1CA9SB1	No	2.23E+03	No	No	</=PRG
2-Hexanone	591-78-6	mg/kg	4 : 39 : 42	10	5.58E-03	1.60E-03	1.20E-02	AOC1CA5SB3	No	5.28E+02	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	23 : 34 : 34	68	4.40E+00	4.20E-02	1.30E+02	AOC1CA12	No	5.59E+00	Yes	Yes	>PRG
4-Methyl-2-pentanone	108-10-1	mg/kg	2 : 19 : 42	5	4.61E-03	2.60E-03	5.40E-03	AOC1CA9SB1	No	5.28E+02	No	No	</=PRG
Acenaphthene	83-32-9	mg/kg	5 : 34 : 34	15	8.94E-01	4.70E-02	1.10E+01	AOC1CA12	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	17 : 34 : 34	50	5.27E+00	3.80E-02	1.60E+02	AOC1CA12	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	27 : 39 : 42	64	4.64E-02	3.90E-03	6.70E-01	AOC1CA9SB1	No	1.41E+03	No	No	</=PRG
Acetophenone	98-86-2	mg/kg	2 : 29 : 34	6	1.94E-01	1.30E-01	2.40E-01	AOC1CA11	No	7.80E+02	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	34 : 34 : 34	100	1.33E+04	3.03E+03	3.22E+04	MW-11S	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	21 : 34 : 34	62	7.39E+00	5.50E-02	2.30E+02	AOC1CA12	No	2.19E+03	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	31 : 34 : 34	91	9.49E+00	2.20E+00	2.40E+01	AOC1CA10	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	34 : 34 : 34	100	1.13E+02	9.40E+00	3.00E+02	MW-11S	No	5.37E+02	No	No	</=PRG
Benzaldehyde	100-52-7	mg/kg	3 : 29 : 34	9	9.67E-01	3.80E-02	1.70E+00	MW-12S	No	6.11E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	34 : 41 : 42	81	1.21E+00	2.90E-04	4.70E+01	AOC1CA11SB2	No	6.43E-01	Yes	Yes	>PRG
Benzo(a)anthracene	56-55-3	mg/kg	23 : 34 : 34	68	6.95E+00	8.00E-02	2.10E+02	AOC1CA12	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	23 : 34 : 34	68	6.06E+00	4.10E-02	1.80E+02	AOC1CA12	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	25 : 34 : 34	74	4.89E+00	5.20E-02	1.40E+02	AOC1CA12	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	26 : 34 : 34	76	3.88E+00	5.20E-02	1.10E+02	AOC1CA12	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	24 : 34 : 34	71	5.72E+00	4.80E-02	1.70E+02	AOC1CA12	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	24 : 34 : 34	71	1.66E+00	6.50E-01	7.30E+00	MW-11S	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phthal	117-81-7	mg/kg	6 : 6 : 34	18	6.95E-02	3.60E-02	1.50E-01	MW-12S	No	3.47E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	23 : 34 : 34	68	3.78E+00	6.10E-01	5.02E+01	MW-17S	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	34 : 34 : 34	100	8.53E+04	2.00E+03	2.17E+05	MW-11S	Yes	NA	–	No	EN
Carbazole	86-74-8	mg/kg	14 : 34 : 34	41	2.56E+00	3.90E-02	6.90E+01	AOC1CA12	No	2.43E+01	Yes	Yes	>PRG
Carbon disulfide	75-15-0	mg/kg	22 : 40 : 42	52	1.98E-02	3.00E-04	6.10E-01	AOC1CA11SB2	No	3.55E+01	No	No	</=PRG
Chlorobenzene	108-90-7	mg/kg	1 : 1 : 42	2	1.90E-03	1.90E-03	1.90E-03	AOC1CA5SB3	No	1.51E+01	No	No	</=PRG
Chloromethane	74-87-3	mg/kg	1 : 1 : 42	2	4.80E-04	4.80E-04	4.80E-04	MW-17S	No	4.69E+00	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	34 : 34 : 34	100	3.09E+01	5.60E+00	8.66E+01	AOC1CA8	No	2.20E+01	Yes	Yes	>PRG

TABLE B-2a
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Chrysene	218-01-9	mg/kg	26 : 34 : 34	76	6.71E+00	5.00E-02	2.00E+02	AOC1CA12	No	6.21E+01	Yes	Yes	>PRG
Cobalt	7440-48-4	mg/kg	19 : 34 : 34	56	6.32E+00	4.50E+00	1.45E+01	MW-16S	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	34 : 34 : 34	100	2.98E+01	5.30E+00	9.37E+01	AOC1CA8	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	18 : 34 : 34	53	2.61E+00	8.55E-01	1.12E+01	AOC1CA10	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	30 : 40 : 42	71	5.08E-03	3.30E-04	8.50E-02	AOC1CA11SB2	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	20 : 34 : 34	59	1.57E+00	5.20E-02	3.50E+01	AOC1CA12	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	19 : 34 : 34	56	4.07E+00	4.00E-02	1.20E+02	AOC1CA12	No	1.45E+01	Yes	Yes	>PRG
Di-n-butylphthalate	84-74-2	mg/kg	1 : 1 : 34	3	5.20E-02	5.20E-02	5.20E-02	MW-16S	No	6.11E+02	No	No	</=PRG
Dioxin TEQ-HH	Dioxin TEQ-	mg/kg	8 : 10 : 10	80	1.71E-06	1.44E-07	4.15E-06	AOC1CA3	No	3.90E-06	Yes	Yes	>PRG
Ethylbenzene	100-41-4	mg/kg	21 : 41 : 42	50	5.62E-02	3.10E-04	1.00E+00	AOC1CA11SB2	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	26 : 34 : 34	76	1.72E+01	4.40E-02	5.50E+02	AOC1CA12	No	2.29E+02	Yes	Yes	>PRG
Fluorene	86-73-7	mg/kg	13 : 34 : 34	38	6.18E+00	4.10E-02	1.90E+02	AOC1CA12	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	24 : 34 : 34	71	3.59E+00	4.20E-02	1.00E+02	AOC1CA12	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	34 : 34 : 34	100	7.89E+04	6.88E+03	4.28E+05	MW-17S	No	2.35E+03	Yes	Yes	>PRG
Isopropylbenzene	98-82-8	mg/kg	13 : 41 : 42	31	1.69E-01	3.70E-04	4.50E+00	AOC1CA6SB1	No	1.57E+01	No	No	</=PRG
Lead	7439-92-1	mg/kg	33 : 34 : 34	97	3.98E+02	2.80E+00	3.84E+03	AOC1CA9	No	4.00E+02	Yes	Yes	>PRG
Magnesium	7439-95-4	mg/kg	34 : 34 : 34	100	2.36E+04	2.31E+03	6.32E+04	AOC1CA4	Yes	NA	–	No	EN
Manganese	7439-96-5	mg/kg	34 : 34 : 34	100	2.03E+03	2.18E+02	5.23E+03	MW-16S	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	15 : 34 : 34	44	8.09E-02	3.00E-02	1.20E+00	AOC1CA12	No	2.30E+00	No	No	</=PRG
Methyl acetate	79-20-9	mg/kg	2 : 41 : 42	5	1.72E-02	2.20E-01	2.60E-01	AOC1CA6SB1	No	2.21E+03	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	31 : 41 : 42	74	1.48E-02	5.00E-04	2.60E-01	AOC1CA11SB2	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	13 : 13 : 42	31	8.05E-04	3.60E-04	1.30E-03	C1CA9SB1, MW-1	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	22 : 34 : 34	65	3.33E+01	4.90E-02	1.10E+03	AOC1CA12	No	5.59E+00	Yes	Yes	>PRG
Nickel	7440-02-0	mg/kg	34 : 34 : 34	100	1.90E+01	5.00E+00	3.97E+01	AOC1CA11	No	1.56E+02	No	No	</=PRG
o-Cresol (2-Methylphe	95-48-7	mg/kg	1 : 1 : 34	3	4.90E-02	4.90E-02	4.90E-02	AOC1CA10	No	3.06E+02	No	No	</=PRG
p-Cresol (4-Methylphe	106-44-5	mg/kg	3 : 3 : 34	9	1.19E-01	6.80E-02	1.70E-01	MW-12S	No	3.06E+01	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	25 : 34 : 34	74	1.92E+01	3.60E-02	6.20E+02	AOC1CA12	No	2.19E+03	No	No	</=PRG
Phenol	108-95-2	mg/kg	2 : 2 : 34	6	5.95E-02	5.20E-02	6.70E-02	AOC1CA13	No	1.83E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	34 : 34 : 34	100	1.34E+03	4.40E+02	2.47E+03	AOC1CA13	Yes	NA	–	No	EN
Pyrene	129-00-0	mg/kg	26 : 34 : 34	76	1.21E+01	5.20E-02	3.80E+02	AOC1CA12	No	2.32E+02	Yes	Yes	>PRG
Selenium	7782-49-2	mg/kg	16 : 32 : 34	47	2.68E+00	1.80E+00	6.90E+00	AOC1CA9	No	3.91E+01	No	No	</=PRG
Silver	7440-22-4	mg/kg	8 : 34 : 34	24	1.28E+00	1.50E+00	5.60E+00	AOC1CA9	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	31 : 34 : 34	91	3.48E+02	6.69E+01	1.26E+03	MW-11S	Yes	NA	–	No	EN
Styrene	100-42-5	mg/kg	1 : 41 : 42	2	4.54E-02	9.50E-01	9.50E-01	AOC1CA5SB3	No	4.40E+02	No	No	</=PRG

TABLE B-2a
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Tetrachloroethene	127-18-4	mg/kg	1 : 1 : 42	2	3.90E-04	3.90E-04	3.90E-04	MW-17S	No	4.84E-01	No	No	</=PRG
Thallium	7440-28-0	mg/kg	1 : 8 : 34	3	6.62E-01	1.30E+00	1.30E+00	AOC1CA4	No	5.16E-01	Yes	No	<5%FOD
Toluene	108-88-3	mg/kg	35 : 41 : 42	83	1.33E+00	2.70E-04	4.50E+01	AOC1CA11SB2	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	17 : 34 : 34	50	5.66E+00	7.30E-02	1.21E+02	AOC1CA9	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	20 : 42 : 42	48	4.08E+00	1.01E-03	1.01E+02	AOC1CA12SB4	No	2.71E+01	Yes	Yes	>PRG
trans-1,3-Dichloroprop	10061-02-6	mg/kg	1 : 39 : 42	2	2.98E-03	8.80E-03	8.80E-03	AOC1CA9SB1	No	7.77E-01	No	No	</=PRG
Trichloroethene	79-01-6	mg/kg	1 : 1 : 42	2	4.30E-04	4.30E-04	4.30E-04	MW-17S	No	5.30E-02	No	No	</=PRG
Trichlorofluoromethane	75-69-4	mg/kg	1 : 1 : 42	2	6.50E-04	6.50E-04	6.50E-04	MW-17S	No	3.86E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	34 : 34 : 34	100	2.91E+01	7.10E+00	5.41E+01	MW-17S	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	34 : 34 : 34	100	1.61E+03	1.37E+01	2.14E+04	AOC1CA9	No	2.35E+03	Yes	Yes	>PRG
AOC 18 and AOC 21													
2-Butanone	78-93-3	mg/kg	1 : 27 : 30	3	5.33E-03	6.00E-03	6.00E-03	AOC21SB12	No	2.23E+03	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	2 : 2 : 30	7	1.50E-01	1.40E-01	1.60E-01	AOC21SB6	No	5.59E+00	No	No	</=PRG
Acenaphthene	83-32-9	mg/kg	2 : 2 : 42	5	2.55E-02	2.20E-02	2.90E-02	AOC21SB6	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	5 : 42 : 42	12	2.83E-01	3.00E-02	2.40E+00	AOC18SB3	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	15 : 30 : 30	50	3.55E-02	3.20E-03	9.50E-02	AOC21SB12	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	42 : 42 : 42	100	1.53E+04	2.28E+03	5.01E+04	AOC18SB2	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	6 : 42 : 42	14	2.33E-01	2.10E-02	8.80E-01	AOC18SB3	No	2.19E+03	No	No	</=PRG
Antimony	7440-36-0	mg/kg	3 : 3 : 42	7	4.61E-01	3.22E-01	5.57E-01	AOC21SB1	No	3.13E+00	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	41 : 42 : 42	98	7.05E+00	6.66E-01	1.84E+01	AOC21SB1	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	42 : 42 : 42	100	9.34E+01	9.00E+00	3.99E+02	AOC18SB2	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	13 : 42 : 42	31	2.89E-03	5.80E-04	2.70E-02	AOC18SB1	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	10 : 42 : 42	24	4.06E-01	1.50E-02	7.50E+00	AOC18SB3	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	7 : 42 : 42	17	3.94E-01	4.70E-02	6.60E+00	AOC18SB3	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	8 : 42 : 42	19	4.16E-01	4.00E-02	7.40E+00	AOC18SB3	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	8 : 42 : 42	19	3.82E-01	3.70E-02	5.90E+00	AOC18SB3	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	9 : 42 : 42	21	4.10E-01	1.90E-02	7.70E+00	AOC18SB3	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	22 : 42 : 42	52	1.10E+00	4.34E-01	8.20E+00	AOC18SB4	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phthal	117-81-7	mg/kg	1 : 1 : 30	3	4.00E-02	4.00E-02	4.00E-02	AOC21SB10	No	3.47E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	12 : 42 : 42	29	3.78E-01	2.55E-01	1.70E+00	AOC18SB1	No	3.70E+00	No	No	</=PRG
Calcium	7440-70-2	mg/kg	42 : 42 : 42	100	1.07E+05	1.78E+03	1.18E+06	AOC21SB8	Yes	NA	–	No	EN
Carbazole	86-74-8	mg/kg	2 : 30 : 30	7	1.93E-01	1.90E-01	2.80E-01	AOC21SB6	No	2.43E+01	No	No	</=PRG
Carbon disulfide	75-15-0	mg/kg	8 : 8 : 30	27	1.31E-03	4.40E-04	3.40E-03	AOC21SB8	No	3.55E+01	No	No	</=PRG
Chloroform	67-66-3	mg/kg	2 : 2 : 30	7	1.25E-03	1.10E-03	1.40E-03	AOC21SB1	No	2.21E-01	No	No	</=PRG

TABLE B-2a
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Chloromethane	74-87-3	mg/kg	3 : 3 : 30	10	1.37E-03	1.10E-03	1.70E-03	MW-15S	No	4.69E+00	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	42 : 42 : 42	100	1.78E+01	3.53E+00	5.10E+01	AOC18SB5	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	11 : 42 : 42	26	4.53E-01	3.20E-02	9.10E+00	AOC18SB3	No	6.21E+01	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	30 : 42 : 42	71	6.93E+00	2.43E+00	1.52E+01	AOC21SB9	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	34 : 42 : 42	81	1.41E+01	4.10E+00	3.41E+01	AOC18SB1	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	3 : 42 : 42	7	6.50E-01	1.58E+00	6.70E+00	AOC18SB1	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	7 : 11 : 30	23	1.82E-03	4.50E-04	2.90E-03	AOC21SB11	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	5 : 42 : 42	12	2.44E-01	5.10E-02	1.90E+00	AOC18SB3	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	3 : 30 : 30	10	1.97E-01	1.90E-02	4.30E-01	AOC21SB8	No	1.45E+01	No	No	</=PRG
Dioxin TEQ-HH	Dioxin TEQ-	mg/kg	12 : 12 : 12	100	3.16E-07	4.88E-08	6.54E-07	AOC21SB4	No	3.90E-06	No	No	</=PRG
Ethylbenzene	100-41-4	mg/kg	12 : 12 : 42	29	8.59E-04	4.70E-04	1.40E-03	AOC18SB2	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	14 : 42 : 42	33	5.76E-01	3.20E-02	1.10E+01	AOC18SB3	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	4 : 41 : 42	10	2.13E-01	2.80E-02	6.70E-01	AOC21SB6	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	6 : 42 : 42	14	3.63E-01	1.30E-01	5.40E+00	AOC18SB3	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	42 : 42 : 42	100	1.94E+04	5.88E+03	4.77E+04	AOC18SB1	No	2.35E+03	Yes	Yes	>PRG
Lead	7439-92-1	mg/kg	38 : 42 : 42	90	1.20E+01	2.45E+00	9.35E+01	AOC18SB1	No	4.00E+02	No	No	</=PRG
Magnesium	7439-95-4	mg/kg	42 : 42 : 42	100	2.43E+04	1.10E+03	7.21E+04	AOC21SB12	Yes	NA	--	No	EN
Manganese	7439-96-5	mg/kg	42 : 42 : 42	100	1.31E+03	1.95E+02	7.57E+03	AOC18SB3	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	4 : 42 : 42	10	1.79E-02	2.60E-02	1.60E-01	AOC18SB1	No	2.30E+00	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	11 : 14 : 30	37	1.77E-03	3.90E-04	4.40E-03	AOC21SB11	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	6 : 6 : 30	20	6.23E-04	3.10E-04	1.00E-03	MW-15S	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	4 : 42 : 42	10	2.44E-01	6.50E-02	8.10E-01	AOC21SB2	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	40 : 42 : 42	95	1.47E+01	4.60E+00	3.65E+01	AOC21SB1	No	1.56E+02	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	12 : 42 : 42	29	4.05E-01	2.00E-02	3.50E+00	AOC18SB3	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	35 : 42 : 42	83	1.53E+03	4.89E+02	5.28E+03	AOC21SB9	Yes	NA	--	No	EN
Pyrene	129-00-0	mg/kg	14 : 42 : 42	33	6.15E-01	3.10E-02	1.40E+01	AOC18SB3	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	23 : 42 : 42	55	2.21E+00	7.91E-01	7.70E+00	AOC18SB2	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	39 : 42 : 42	93	2.88E+02	2.46E+01	1.94E+03	AOC18SB4	Yes	NA	--	No	EN
Thallium	7440-28-0	mg/kg	5 : 20 : 42	12	5.61E-01	2.58E-01	1.14E+00	AOC21SB1	No	5.16E-01	Yes	Yes	>PRG
Toluene	108-88-3	mg/kg	22 : 42 : 42	52	2.21E-03	3.60E-04	5.30E-03	AOC21SB8	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	2 : 42 : 42	5	6.94E-02	9.45E-02	1.30E+00	AOC18SB1	No	1.10E-01	Yes	No	<5%FOD
TOTAL XYLENES	TOTAL XY	mg/kg	14 : 42 : 42	33	3.58E-03	8.60E-04	7.14E-03	AOC18SB6	No	2.71E+01	No	No	</=PRG
Trichloroethene	79-01-6	mg/kg	1 : 1 : 30	3	3.60E-04	3.50E-04	3.50E-04	MW-15S	No	5.30E-02	No	No	</=PRG
Trichlorofluoromethane	75-69-4	mg/kg	3 : 3 : 30	10	7.93E-04	6.70E-04	8.90E-04	MW-15S	No	3.86E+01	No	No	</=PRG

TABLE B-2a
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Vanadium	7440-62-2	mg/kg	41 : 42 : 42	98	2.55E+01	6.49E+00	6.31E+01	AOC21SB1	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	42 : 42 : 42	100	5.27E+01	5.40E+00	3.86E+02	AOC18SB1	No	2.35E+03	No	No	</=PRG
AOC 19													
Acenaphthene	83-32-9	mg/kg	1 : 32 : 32	3	3.14E-01	1.00E+00	1.00E+00	AOC19SB1	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	8 : 28 : 32	25	1.82E-01	5.90E-02	3.70E-01	AOC19SB9	No	3.68E+02	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	32 : 32 : 32	100	8.91E+03	1.97E+03	2.26E+04	AOC19SB6	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	11 : 32 : 32	34	2.55E-01	6.70E-02	2.15E+00	AOC19SB1	No	2.19E+03	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	32 : 32 : 32	100	1.16E+01	4.30E+00	1.01E+02	AOC19SB8	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	32 : 32 : 32	100	7.27E+01	1.03E+01	2.87E+02	AOC19SB9	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	19 : 30 : 32	59	1.49E-03	3.40E-04	2.90E-03	AOC19SB11	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	10 : 32 : 32	31	4.88E-01	8.90E-02	4.25E+00	AOC19SB1	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	10 : 32 : 32	31	4.64E-01	9.20E-02	3.05E+00	AOC19SB1	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	9 : 32 : 32	28	4.47E-01	8.70E-02	2.95E+00	AOC19SB1	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	7 : 32 : 32	22	3.71E-01	7.00E-02	1.70E+00	AOC19SB9	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	10 : 32 : 32	31	4.55E-01	1.00E-01	3.00E+00	AOC19SB1	No	6.21E+00	No	No	</=PRG
Beryllium	7440-41-7	mg/kg	19 : 32 : 32	59	6.78E-01	5.70E-01	1.45E+00	AOC19SB1	No	1.54E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	7 : 32 : 32	22	6.10E-01	4.55E-01	7.40E+00	AOC19SB9	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	32 : 32 : 32	100	7.02E+04	1.57E+03	1.38E+05	AOC19SB8	Yes	NA	--	No	EN
Chromium (total)	7440-47-3	mg/kg	32 : 32 : 32	100	2.11E+01	4.50E+00	1.26E+02	AOC19SB13	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	10 : 32 : 32	31	5.06E-01	1.20E-01	4.15E+00	AOC19SB1	No	6.21E+01	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	16 : 32 : 32	50	5.63E+00	5.50E+00	1.15E+01	AOC19SB6	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	32 : 32 : 32	100	3.73E+01	6.20E+00	5.40E+02	AOC19SB9	No	3.13E+02	Yes	Yes	>PRG
CYANIDE	57-12-5	mg/kg	1 : 32 : 32	3	9.13E-01	1.12E+01	1.12E+01	AOC19SB11	No	1.22E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	4 : 31 : 32	13	2.36E-01	9.00E-02	5.70E-01	AOC19SB1	No	6.21E-02	Yes	Yes	>PRG
Dioxin TEQ-HH	Dioxin TEQ-	mg/kg	11 : 14 : 14	79	2.51E-06	5.04E-08	8.55E-06	AOC19SB1	No	3.90E-06	Yes	Yes	>PRG
Ethylbenzene	100-41-4	mg/kg	13 : 13 : 32	41	6.12E-04	3.30E-04	1.60E-03	AOC19SB11	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	19 : 32 : 32	59	8.14E-01	5.20E-02	9.10E+00	AOC19SB1	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	4 : 32 : 32	13	3.02E-01	6.50E-02	9.50E-01	AOC19SB1	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	7 : 32 : 32	22	3.56E-01	6.30E-02	1.50E+00	AOC19SB9	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	32 : 32 : 32	100	1.77E+04	6.11E+03	3.73E+04	AOC19SB13	No	2.35E+03	Yes	Yes	>PRG
Lead	7439-92-1	mg/kg	26 : 32 : 32	81	3.09E+01	5.00E+00	4.35E+02	AOC19SB9	No	4.00E+02	Yes	Yes	>PRG
Magnesium	7439-95-4	mg/kg	32 : 32 : 32	100	2.68E+04	2.00E+03	5.90E+04	AOC19SB4	Yes	NA	--	No	EN
Manganese	7439-96-5	mg/kg	32 : 32 : 32	100	6.72E+02	1.93E+02	3.68E+03	AOC19SB13	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	14 : 32 : 32	44	1.52E-01	4.00E-02	2.70E+00	AOC19SB11	No	2.30E+00	Yes	Yes	>PRG

TABLE B-2a
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Naphthalene	91-20-3	mg/kg	11 : 30 : 32	34	2.35E-01	3.60E-02	8.90E-01	AOC19SB12	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	32 : 32 : 32	100	1.41E+01	5.40E+00	2.87E+01	AOC19SB12	No	1.56E+02	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	16 : 32 : 32	50	5.95E-01	8.30E-02	8.10E+00	AOC19SB1	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	22 : 32 : 32	69	1.12E+03	4.11E+02	2.82E+03	AOC19SB1	Yes	NA	–	No	EN
Pyrene	129-00-0	mg/kg	19 : 32 : 32	59	7.33E-01	4.60E-02	8.60E+00	AOC19SB1	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	13 : 32 : 32	41	1.95E+00	1.33E+00	5.90E+00	AOC19SB6	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	28 : 32 : 32	88	1.36E+02	5.96E+01	5.06E+02	AOC19SB2	Yes	NA	–	No	EN
Thallium	7440-28-0	mg/kg	1 : 32 : 32	3	5.84E-01	1.30E+00	1.30E+00	AOC19SB6	No	5.16E-01	Yes	No	<5%FOD
Toluene	108-88-3	mg/kg	25 : 32 : 32	78	1.66E-03	4.70E-04	5.30E-03	AOC19SB11	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	3 : 32 : 32	9	5.52E-02	1.69E-01	3.15E-01	AOC19SB10	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	11 : 20 : 32	34	1.98E-03	8.20E-04	3.60E-03	AOC19SB11	No	2.71E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	32 : 32 : 32	100	2.55E+01	7.30E+00	6.70E+01	AOC19SB13	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	32 : 32 : 32	100	8.85E+01	1.55E+01	9.42E+02	AOC19SB9	No	2.35E+03	No	No	</=PRG
AOC 2 - RA													
1,1-Biphenyl	92-52-4	mg/kg	1 : 20 : 20	5	1.97E-01	2.90E-01	2.90E-01	AOC2SB2	No	3.01E+02	No	No	</=PRG
1,2-Dichlorobenzene	95-50-1	mg/kg	1 : 1 : 20	5	1.50E-03	1.50E-03	1.50E-03	AOC2SB1	No	1.10E+02	No	No	</=PRG
1,3-Dichlorobenzene	541-73-1	mg/kg	1 : 1 : 20	5	1.80E-03	1.80E-03	1.80E-03	AOC2SB1	No	5.31E+01	No	No	</=PRG
1,4-Dichlorobenzene	106-46-7	mg/kg	1 : 5 : 20	5	2.47E-03	2.50E-03	2.50E-03	AOC2SB1	No	3.45E+00	No	No	</=PRG
2-Butanone	78-93-3	mg/kg	7 : 20 : 20	35	6.77E-03	1.40E-03	3.20E-02	AOC2SB7	No	2.23E+03	No	No	</=PRG
2-Hexanone	591-78-6	mg/kg	1 : 19 : 20	5	8.67E-03	1.60E-02	1.60E-02	AOC2SB2	No	5.28E+02	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	3 : 20 : 20	15	1.95E-01	7.80E-02	3.50E-01	AOC2SB2	No	5.59E+00	No	No	</=PRG
Acenaphthene	83-32-9	mg/kg	1 : 20 : 20	5	2.08E-01	5.00E-01	5.00E-01	AOC2SB4	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	4 : 20 : 20	20	2.17E-01	3.70E-02	1.00E+00	AOC2SB1	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	15 : 18 : 20	75	2.74E-02	3.40E-03	1.50E-01	AOC2SB7	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	20 : 20 : 20	100	1.78E+04	2.16E+03	4.38E+04	AOC2SB6	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	5 : 20 : 20	25	3.02E-01	1.60E-02	1.50E+00	AOC2SB1	No	2.19E+03	No	No	</=PRG
Antimony	7440-36-0	mg/kg	4 : 5 : 20	20	1.05E+00	3.33E-01	3.61E+00	AOC2SB5	No	3.13E+00	Yes	Yes	>PRG
Arsenic	7440-38-2	mg/kg	18 : 20 : 20	90	5.09E+00	5.15E-01	2.37E+01	AOC2SB2	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	20 : 20 : 20	100	1.55E+02	1.06E+01	4.20E+02	AOC2SB6	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	6 : 18 : 20	30	2.45E-03	4.90E-04	7.10E-03	AOC2SB7	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	12 : 20 : 20	60	5.18E-01	1.90E-02	3.80E+00	AOC2SB1	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	9 : 20 : 20	45	6.59E-01	6.80E-02	5.60E+00	AOC2SB1	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	9 : 20 : 20	45	8.33E-01	2.60E-02	9.30E+00	AOC2SB1	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	10 : 20 : 20	50	4.21E-01	6.30E-02	2.80E+00	AOC2SB1	No	2.32E+02	No	No	</=PRG

TABLE B-2a
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Benzo(k)fluoranthene	207-08-9	mg/kg	12 : 20 : 20	60	3.83E-01	2.50E-02	2.40E+00	AOC2SB1	No	6.21E+00	No	No	</=PRG
Beryllium	7440-41-7	mg/kg	13 : 20 : 20	65	2.99E+00	4.33E-01	9.19E+00	AOC2SB6	No	1.54E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	6 : 20 : 20	30	5.13E-01	1.71E-01	5.64E+00	AOC2SB2	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	20 : 20 : 20	100	1.35E+05	2.09E+03	2.93E+05	AOC2SB6	Yes	NA	--	No	EN
Carbazole	86-74-8	mg/kg	4 : 20 : 20	20	1.92E-01	4.80E-02	3.60E-01	AOC2SB1	No	2.43E+01	No	No	</=PRG
Carbon disulfide	75-15-0	mg/kg	8 : 18 : 20	40	4.95E-03	7.20E-04	1.00E-02	AOC2SB5	No	3.55E+01	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	16 : 20 : 20	80	1.45E+01	1.07E+01	3.32E+01	AOC2SB2	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	11 : 20 : 20	55	6.14E-01	3.10E-02	5.40E+00	AOC2SB1	No	6.21E+01	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	20 : 20 : 20	100	3.74E+00	4.42E-01	9.17E+00	AOC2SB8	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	20 : 20 : 20	100	1.23E+01	3.92E+00	4.91E+01	AOC2SB2	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	15 : 20 : 20	75	1.20E+00	1.25E-01	9.50E+00	AOC2SB2	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	1 : 6 : 20	5	3.12E-03	4.10E-03	4.10E-03	AOC2SB4	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	7 : 20 : 20	35	2.65E-01	3.30E-02	1.40E+00	AOC2SB1	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	4 : 20 : 20	20	1.76E-01	3.10E-02	2.50E-01	AOC2SB2	No	1.45E+01	No	No	</=PRG
Dioxin TEQ-HH	Dioxin TEQ-	mg/kg	7 : 7 : 7	100	1.71E-06	1.00E-07	5.42E-06	AOC2SB2	No	3.90E-06	Yes	Yes	>PRG
Ethylbenzene	100-41-4	mg/kg	3 : 19 : 20	15	2.79E-03	2.00E-03	4.50E-03	AOC2SB7	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	10 : 20 : 20	50	6.85E-01	4.60E-02	3.70E+00	AOC2SB4	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	3 : 20 : 20	15	1.87E-01	1.30E-01	2.40E-01	AOC2SB4	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	8 : 20 : 20	40	4.16E-01	5.30E-02	2.80E+00	AOC2SB1	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	20 : 20 : 20	100	2.65E+04	4.41E+03	2.13E+05	AOC2SB2	No	2.35E+03	Yes	Yes	>PRG
Lead	7439-92-1	mg/kg	20 : 20 : 20	100	3.04E+01	3.03E-01	3.36E+02	AOC2SB2	No	4.00E+02	No	No	</=PRG
Magnesium	7439-95-4	mg/kg	20 : 20 : 20	100	4.32E+04	2.44E+03	7.79E+04	AOC2SB2	Yes	NA	--	No	EN
Manganese	7439-96-5	mg/kg	20 : 20 : 20	100	1.59E+03	2.15E+02	3.45E+03	AOC2SB6	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	10 : 20 : 20	50	2.92E-02	1.20E-02	1.17E-01	AOC2SB4	No	2.30E+00	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	2 : 7 : 20	10	3.02E-03	1.80E-03	4.70E-03	AOC2SB4	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	5 : 5 : 20	25	4.13E-04	3.00E-04	4.50E-04	AOC2SB3	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	4 : 20 : 20	20	1.92E-01	9.40E-02	4.10E-01	AOC2SB2	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	20 : 20 : 20	100	1.14E+01	3.74E+00	2.51E+01	AOC2SB2	No	1.56E+02	No	No	</=PRG
p-Cresol (4-Methylphe	106-44-5	mg/kg	1 : 1 : 20	5	3.40E-02	3.40E-02	3.40E-02	AOC2SB1	No	3.06E+01	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	7 : 20 : 20	35	4.67E-01	3.30E-02	2.40E+00	AOC2SB4	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	10 : 20 : 20	50	1.30E+03	7.14E+02	3.21E+03	AOC2SB6	Yes	NA	--	No	EN
Pyrene	129-00-0	mg/kg	11 : 20 : 20	55	6.93E-01	4.20E-02	4.00E+00	AOC2SB1	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	9 : 20 : 20	45	2.10E+00	1.19E+00	5.73E+00	AOC2SB6	No	3.91E+01	No	No	</=PRG
Silver	7440-22-4	mg/kg	1 : 20 : 20	5	1.95E-01	1.03E+00	1.03E+00	AOC2SB2	No	3.91E+01	No	No	</=PRG

TABLE B-2a
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Sodium	7440-23-5	mg/kg	13 : 20 : 20	65	9.20E+02	4.54E+01	2.59E+03	AOC2SB6	Yes	NA	--	No	EN
Thallium	7440-28-0	mg/kg	5 : 20 : 20	25	3.03E-01	3.00E-01	2.47E+00	AOC2SB2	No	5.16E-01	Yes	Yes	>PRG
Toluene	108-88-3	mg/kg	7 : 20 : 20	35	3.32E-03	9.70E-04	1.10E-02	AOC2SB7	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	6 : 20 : 20	30	1.56E-01	2.32E-02	2.70E+00	AOC2SB2	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	3 : 8 : 20	15	3.54E-03	4.10E-03	4.80E-03	OC2SB7, AOC2SE	No	2.71E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	20 : 20 : 20	100	1.94E+01	7.05E+00	4.63E+01	AOC2SB8	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	20 : 20 : 20	100	1.35E+02	1.82E+00	1.39E+03	AOC2SB2	No	2.35E+03	No	No	</=PRG
Block A													
1,2-Dichloroethane	107-06-2	mg/kg	1 : 1 : 38	3	4.60E-04	4.60E-04	4.60E-04	BACA2SB1	No	2.78E-01	No	No	</=PRG
2-Butanone	78-93-3	mg/kg	7 : 37 : 38	18	6.49E-03	3.35E-03	4.10E-02	BACA8SB2	No	2.23E+03	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	3 : 3 : 31	10	6.37E-02	4.30E-02	1.00E-01	BACA8	No	5.59E+00	No	No	</=PRG
4-Methyl-2-pentanone	108-10-1	mg/kg	1 : 1 : 38	3	1.10E-03	1.10E-03	1.10E-03	MW-18S	No	5.28E+02	No	No	</=PRG
Acenaphthene	83-32-9	mg/kg	1 : 1 : 31	3	1.40E-01	1.40E-01	1.40E-01	BACA7	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	9 : 31 : 31	29	3.35E-01	6.40E-02	3.40E+00	BACA7	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	25 : 37 : 38	66	1.73E-02	3.40E-03	8.10E-02	BACA8SB1	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	31 : 31 : 31	100	2.61E+04	3.99E+03	4.67E+04	MW-13S	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	10 : 31 : 31	32	2.59E-01	5.30E-02	2.00E+00	MW-13S	No	2.19E+03	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	25 : 31 : 31	81	3.23E+00	1.10E+00	9.40E+00	BACA10, BACA10	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	31 : 31 : 31	100	2.37E+02	1.26E+01	4.93E+02	MW-13S	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	28 : 38 : 38	74	6.60E-01	3.90E-04	2.50E+01	BACA7SB4	No	6.43E-01	Yes	Yes	>PRG
Benzo(a)anthracene	56-55-3	mg/kg	17 : 31 : 31	55	4.12E-01	4.20E-02	3.10E+00	MW-13S	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	16 : 31 : 31	52	7.37E-01	5.80E-02	9.10E+00	MW-13S	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	18 : 31 : 31	58	7.06E-01	4.30E-02	1.10E+01	MW-13S	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	16 : 31 : 31	52	6.18E-01	6.10E-02	8.60E+00	MW-13S	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	18 : 31 : 31	58	5.77E-01	4.00E-02	7.70E+00	MW-13S	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	30 : 31 : 31	97	4.20E+00	6.10E-01	8.90E+00	MW-13S	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phthal	117-81-7	mg/kg	9 : 28 : 31	29	1.58E-01	4.30E-02	2.70E-01	BACA2	No	3.47E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	15 : 31 : 31	48	1.35E+00	4.58E-01	1.19E+01	BACA13	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	31 : 31 : 31	100	1.75E+05	1.07E+04	2.93E+05	BACA2	Yes	NA	--	No	EN
Carbazole	86-74-8	mg/kg	3 : 29 : 31	10	1.90E-01	9.60E-02	3.50E-01	MW-13S	No	2.43E+01	No	No	</=PRG
Carbon disulfide	75-15-0	mg/kg	31 : 38 : 38	82	3.68E-02	4.60E-04	1.20E+00	BACA7SB4	No	3.55E+01	No	No	</=PRG
Chloromethane	74-87-3	mg/kg	5 : 5 : 38	13	9.39E-04	3.30E-04	1.30E-03	BACA12SB4	No	4.69E+00	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	31 : 31 : 31	100	2.91E+01	7.80E+00	1.70E+02	BACA5	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	20 : 31 : 31	65	5.25E-01	4.30E-02	5.10E+00	MW-13S	No	6.21E+01	No	No	</=PRG

TABLE B-2a
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
cis-1,2-Dichloroethene	156-59-2	mg/kg	2 : 37 : 38	5	3.45E-03	1.50E-03	3.38E-02	MW-18S	No	4.29E+00	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	8 : 31 : 31	26	5.33E+00	6.40E+00	3.06E+01	BACA13	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	30 : 31 : 31	97	1.32E+01	2.60E+00	4.63E+01	BACA12	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	17 : 31 : 31	55	1.45E+00	1.21E+00	4.82E+00	BACA3	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	14 : 37 : 38	37	3.11E-03	6.10E-04	1.00E-02	BACA6SB2	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	11 : 31 : 31	35	2.46E-01	4.40E-02	2.00E+00	MW-13S	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	2 : 2 : 31	6	1.03E-01	4.60E-02	1.60E-01	BACA5	No	1.45E+01	No	No	</=PRG
Dichlorodifluoromethan	75-71-8	mg/kg	1 : 1 : 38	3	6.10E-04	6.10E-04	6.10E-04	BACA3SB2	No	9.39E+00	No	No	</=PRG
Di-n-butylphthalate	84-74-2	mg/kg	1 : 1 : 31	3	9.00E-02	9.00E-02	9.00E-02	BACA6	No	6.11E+02	No	No	</=PRG
Dioxin TEQ-HH	Dioxin TEQ-	mg/kg	8 : 9 : 9	89	2.01E-06	1.12E-07	1.42E-05	MW-13S	No	3.90E-06	Yes	Yes	>PRG
Ethylbenzene	100-41-4	mg/kg	16 : 38 : 38	42	1.48E+00	3.30E-04	5.60E+01	BACA7SB4	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	20 : 31 : 31	65	5.45E-01	5.40E-02	3.50E+00	MW-13S	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	3 : 6 : 31	10	1.57E-01	4.60E-02	1.80E-01	BACA5, BACA7	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	16 : 31 : 31	52	5.13E-01	5.10E-02	6.90E+00	MW-13S	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	31 : 31 : 31	100	3.45E+04	4.73E+03	2.32E+05	BACA13	No	2.35E+03	Yes	Yes	>PRG
Isopropylbenzene	98-82-8	mg/kg	4 : 4 : 38	11	3.50E-04	2.90E-04	4.20E-04	BACA6SB2	No	1.57E+01	No	No	</=PRG
Lead	7439-92-1	mg/kg	29 : 31 : 31	94	1.24E+01	1.90E+00	3.43E+01	BACA12	No	4.00E+02	No	No	</=PRG
Magnesium	7439-95-4	mg/kg	31 : 31 : 31	100	4.16E+04	2.50E+03	6.87E+04	BACA7	Yes	NA	–	No	EN
Manganese	7439-96-5	mg/kg	31 : 31 : 31	100	3.85E+03	2.14E+02	8.69E+03	MW-13S	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	4 : 31 : 31	13	2.52E-02	4.00E-02	8.00E-02	BACA7	No	2.30E+00	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	17 : 37 : 38	45	3.63E-03	4.10E-04	1.60E-02	BACA6SB2	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	9 : 9 : 38	24	9.62E-04	3.70E-04	1.50E-03	CA9SB4, BACA9S	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	4 : 4 : 31	13	6.70E-02	4.00E-02	9.80E-02	BACA8	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	19 : 31 : 31	61	8.76E+00	4.30E+00	3.52E+01	BACA13	No	1.56E+02	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	18 : 31 : 31	58	2.49E-01	3.60E-02	1.80E+00	BACA5	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	31 : 31 : 31	100	1.94E+03	6.75E+02	3.58E+03	MW-13S	Yes	NA	–	No	EN
Pyrene	129-00-0	mg/kg	20 : 31 : 31	65	6.35E-01	5.60E-02	5.60E+00	MW-13S	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	24 : 30 : 31	77	6.13E+00	2.30E+00	1.16E+01	BACA2	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	31 : 31 : 31	100	1.11E+03	1.02E+02	2.11E+03	BACA3	Yes	NA	–	No	EN
Styrene	100-42-5	mg/kg	1 : 38 : 38	3	3.16E+00	1.20E+02	1.20E+02	BACA7SB4	No	4.40E+02	No	No	</=PRG
Tetrachloroethene	127-18-4	mg/kg	1 : 1 : 38	3	1.50E-03	1.50E-03	1.50E-03	BACA9SB4	No	4.84E-01	No	No	</=PRG
Toluene	108-88-3	mg/kg	28 : 38 : 38	74	5.00E+00	3.60E-04	1.90E+02	BACA7SB4	No	6.80E+01	Yes	Yes	>PRG
TOTAL PCBs	Total PCBs	mg/kg	3 : 31 : 31	10	4.24E-02	5.00E-02	1.40E-01	BACA12	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	13 : 38 : 38	34	1.16E+01	1.16E-03	4.40E+02	BACA7SB4	No	2.71E+01	Yes	Yes	>PRG

TABLE B-2a
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
trans-1,2-Dichloroethe	156-60-5	mg/kg	1 : 1 : 38	3	9.20E-04	9.20E-04	9.20E-04	MW-18S	No	6.95E+00	No	No	</=PRG
Trichloroethene	79-01-6	mg/kg	3 : 37 : 38	8	4.26E-03	4.50E-04	6.50E-02	BACA9SB4	No	5.30E-02	Yes	Yes	>PRG
Trichlorofluoromethane	75-69-4	mg/kg	5 : 5 : 38	13	4.22E-04	3.20E-04	4.80E-04	BACA12SB4	No	3.86E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	31 : 31 : 31	100	2.35E+01	7.90E+00	8.52E+01	BACA5	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	29 : 31 : 31	94	2.92E+01	2.65E+00	1.40E+02	BACA8	No	2.35E+03	No	No	</=PRG

Notes:
CAS - Chemical Abstracts Service.
COPC - Chemical of potential
EN - Essential nutrient.
FOD - Frequency of detection.
NA - Not available.
USEPA - United States Environmental Protection Agency.
(a) Frequency of Detection = Number of detected samples: Total number of samples.
(b) Percent of detected samples out of samples collected.
(c) Essential nutrients are not included as COPCs (calcium, magnesium, potassium, sodium).
(d) USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for residential soil. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effec
See Table B-6 for detailed references.
(e) A chemical is identified as a COPC if it is not an essential nutrient, has an FOD greater than 5% (where 20 samples are available) and if the maximum detected concentration is greater than the PRG.

TABLE B-2b
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL - AOC 13 AND SOUTHERN PARCEL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
AOC 13													
1,1-Biphenyl	92-52-4	mg/kg	9 : 79	11	1.38E+02	4.50E-02	1.20E+03	MW-20S	No	3.01E+02	Yes	Yes	>PRG
1,2,4-Trichlorobenzen	120-82-1	mg/kg	1 : 79	1	3.80E-04	3.80E-04	3.80E-04	MW-8S	No	6.22E+00	No	No	</=PRG
1,3-Dichlorobenzene	541-73-1	mg/kg	1 : 79	1	4.10E-04	4.10E-04	4.10E-04	MW-8S	No	5.31E+01	No	No	</=PRG
1,4-Dichlorobenzene	106-46-7	mg/kg	1 : 79	1	3.70E-04	3.70E-04	3.70E-04	MW-8S	No	3.45E+00	No	No	</=PRG
1-METHYLNAPHTHA	90-12-0	mg/kg	5 : 8	63	5.42E-02	3.18E-02	7.08E-02	MW-28S	No	5.59E+00	No	No	</=PRG
2,4-Dimethylphenol	105-67-9	mg/kg	2 : 77	3	2.20E+02	5.20E-02	4.40E+02	MW-20S	No	1.22E+02	Yes	No	<5%FOD
2-Butanone	78-93-3	mg/kg	16 : 79	20	6.42E-03	1.40E-03	1.80E-02	AOC13SB52	No	2.23E+03	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	32 : 79	41	1.77E+02	4.00E-02	5.50E+03	MW-20S	No	5.59E+00	Yes	Yes	>PRG
4-Methyl-2-pentanone	108-10-1	mg/kg	1 : 79	1	1.10E-03	1.10E-03	1.10E-03	AOC13SB10	No	5.28E+02	No	No	</=PRG
Acenaphthene	83-32-9	mg/kg	24 : 79	30	2.05E+01	1.17E-02	4.50E+02	MW-20S	No	3.68E+02	Yes	Yes	>PRG
Acenaphthylene	208-96-8	mg/kg	45 : 79	57	1.28E+02	1.32E-02	5.60E+03	MW-20S	No	3.68E+02	Yes	Yes	>PRG
Acetone	67-64-1	mg/kg	44 : 79	56	2.73E-02	2.60E-03	1.60E-01	AOC13SB12	No	1.41E+03	No	No	</=PRG
Acetophenone	98-86-2	mg/kg	1 : 79	1	5.00E-02	5.00E-02	5.00E-02	AOC13SB42	No	7.80E+02	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	79 : 79	100	1.29E+04	2.10E+03	5.08E+04	MW-21S	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	46 : 79	58	1.08E+02	1.36E-02	4.70E+03	MW-20S	No	2.19E+03	Yes	Yes	>PRG
Antimony	7440-36-0	mg/kg	9 : 82	11	7.77E-01	5.10E-01	1.10E+00	MW-31S	No	3.13E+00	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	78 : 79	99	7.66E+00	1.78E-01	3.87E+01	AOC13SB10	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	79 : 79	100	1.12E+02	1.10E+01	4.37E+02	MW-21S	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	60 : 79	76	3.66E+00	3.00E-04	1.50E+02	AOC13SB2	No	6.43E-01	Yes	Yes	>PRG
Benzo(a)anthracene	56-55-3	mg/kg	54 : 79	68	7.30E+01	4.90E-02	3.60E+03	MW-20S	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	55 : 79	70	5.81E+01	4.08E-02	2.90E+03	MW-20S	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	56 : 79	71	4.55E+01	7.10E-03	2.30E+03	MW-20S	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	55 : 79	70	2.90E+01	3.07E-02	1.40E+03	MW-20S	No	2.32E+02	Yes	Yes	>PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	56 : 79	71	4.79E+01	8.76E-03	2.40E+03	MW-20S	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	48 : 79	61	1.92E+00	6.92E-02	5.50E+00	AOC13SB39	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phtha	117-81-7	mg/kg	9 : 79	11	1.53E-01	5.10E-02	4.80E-01	MW-9S	No	3.47E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	29 : 79	37	1.27E+00	5.90E-02	5.60E+00	AOC13SB6	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	79 : 79	100	9.74E+04	2.74E+03	2.60E+05	MW-21S	Yes	NA	–	No	EN
Carbazole	86-74-8	mg/kg	30 : 79	38	8.31E+01	4.30E-02	2.40E+03	MW-20S	No	2.43E+01	Yes	Yes	>PRG
Carbon disulfide	75-15-0	mg/kg	54 : 79	68	2.70E-03	3.00E-04	2.70E-02	AOC13SB52	No	3.55E+01	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	78 : 79	99	1.75E+01	3.50E+00	1.26E+02	AOC13SB38	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	56 : 79	71	6.46E+01	6.75E-03	3.30E+03	MW-20S	No	6.21E+01	Yes	Yes	>PRG
Cobalt	7440-48-4	mg/kg	32 : 79	41	7.95E+00	2.17E+00	1.53E+01	AOC13SB30	No	1.40E+02	No	No	</=PRG

TABLE B-2b
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL - AOC 13 AND SOUTHERN PARCEL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Copper	7440-50-8	mg/kg	78 : 79	99	2.04E+01	1.64E+00	9.58E+01	AOC13SB2	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	24 : 70	34	8.35E+00	1.21E+00	5.59E+01	AOC13SB2	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	58 : 79	73	3.54E-03	3.20E-04	1.50E-02	AOC13SB26	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracen	53-70-3	mg/kg	41 : 79	52	1.38E+01	2.81E-02	5.10E+02	MW-20S	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	30 : 79	38	1.39E+02	4.90E-02	4.00E+03	MW-20S	No	1.45E+01	Yes	Yes	>PRG
Dichlorodifluorometha	75-71-8	mg/kg	1 : 79	1	6.00E-04	6.00E-04	6.00E-04	MW-8S	No	9.39E+00	No	No	</=PRG
Dimethylphthalate	131-11-3	mg/kg	1 : 79	1	8.40E-02	8.40E-02	8.40E-02	AOC13SB55	No	6.10E+04	No	No	</=PRG
Di-n-butylphthalate	84-74-2	mg/kg	1 : 79	1	3.20E-01	3.20E-01	3.20E-01	AOC13SB43	No	6.11E+02	No	No	</=PRG
Di-n-octylphthalate	117-84-0	mg/kg	1 : 79	1	4.80E+00	4.80E+00	4.80E+00	AOC13SB1	No	2.44E+02	No	No	</=PRG
Dioxin TEQ-HH	Dioxin TEQ	mg/kg	20 : 22	91	1.22E-06	7.11E-08	6.58E-06	AOC13SB1	No	3.90E-06	Yes	Yes	>PRG
Ethylbenzene	100-41-4	mg/kg	47 : 79	59	2.23E-01	3.50E-04	1.00E+01	AOC13SB2	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	57 : 79	72	1.86E+02	7.60E-03	9.80E+03	MW-20S	No	2.29E+02	Yes	Yes	>PRG
Fluorene	86-73-7	mg/kg	36 : 79	46	1.87E+02	2.49E-02	6.50E+03	MW-20S	No	2.75E+02	Yes	Yes	>PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	56 : 79	71	2.82E+01	2.11E-02	1.40E+03	MW-20S	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	79 : 79	100	2.30E+04	1.15E+03	1.90E+05	AOC13SB7	No	2.35E+03	Yes	Yes	>PRG
Isopropylbenzene	98-82-8	mg/kg	21 : 79	27	6.00E-02	2.80E-04	1.20E+00	AOC13SB2	No	1.57E+01	No	No	</=PRG
Lead	7439-92-1	mg/kg	61 : 79	77	5.24E+01	1.53E+00	4.64E+02	MW-25S	No	4.00E+02	Yes	Yes	>PRG
Magnesium	7439-95-4	mg/kg	79 : 79	100	3.05E+04	2.80E+03	8.70E+04	AOC13SB15	Yes	NA	–	No	EN
Manganese	7439-96-5	mg/kg	79 : 79	100	1.08E+03	2.34E+02	7.95E+03	AOC13SB10	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	42 : 79	53	1.07E+00	1.57E-02	1.81E+01	AOC13SB52	No	2.30E+00	Yes	Yes	>PRG
Methylcyclohexane	108-87-2	mg/kg	57 : 79	72	6.26E-03	3.40E-04	2.70E-02	AOC13SB26	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	31 : 79	39	6.33E-04	3.00E-04	2.00E-03	MW-8S	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	56 : 79	71	5.68E+02	5.30E-03	3.10E+04	MW-20S	No	5.59E+00	Yes	Yes	>PRG
Nickel	7440-02-0	mg/kg	75 : 79	95	1.37E+01	3.97E+00	3.76E+01	AOC13SB9	No	1.56E+02	No	No	</=PRG
o-Cresol (2-Methylphe	95-48-7	mg/kg	2 : 77	3	3.05E+02	4.30E-02	6.10E+02	MW-20S	No	3.06E+02	Yes	No	<5%FOD
p-Cresol (4-Methylphe	106-44-5	mg/kg	6 : 77	8	2.69E+02	5.10E-02	1.60E+03	MW-20S	No	3.06E+01	Yes	Yes	>PRG
Phenanthrene	85-01-8	mg/kg	57 : 79	72	2.77E+02	6.38E-03	1.50E+04	MW-20S	No	2.19E+03	Yes	Yes	>PRG
Phenol	108-95-2	mg/kg	5 : 77	6	4.44E+02	1.10E-01	2.20E+03	MW-20S	No	1.83E+03	Yes	Yes	>PRG
Potassium	7440-09-7	mg/kg	79 : 79	100	1.38E+03	2.55E+02	8.33E+03	AOC13SB38	Yes	NA	–	No	EN
Pyrene	129-00-0	mg/kg	56 : 79	71	1.45E+02	4.30E-02	7.50E+03	MW-20S	No	2.32E+02	Yes	Yes	>PRG
Selenium	7782-49-2	mg/kg	31 : 79	39	3.28E+00	1.81E-01	1.13E+01	MW-20S	No	3.91E+01	No	No	</=PRG
Silver	7440-22-4	mg/kg	19 : 79	24	1.70E+00	8.96E-02	6.00E+00	AOC13SB7	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	77 : 79	97	4.28E+02	6.69E+01	4.10E+03	AOC13SB52	Yes	NA	–	No	EN
Styrene	100-42-5	mg/kg	4 : 79	5	6.85E-03	3.80E-03	1.50E-02	AOC13SB39	No	4.40E+02	No	No	</=PRG

TABLE B-2b
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL - AOC 13 AND SOUTHERN PARCEL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Tetrachloroethene	127-18-4	mg/kg	2 : 79	3	4.15E-04	2.90E-04	5.40E-04	MW-8S	No	4.84E-01	No	No	</=PRG
Thallium	7440-28-0	mg/kg	14 : 79	18	9.89E-01	1.41E-02	6.00E+00	MW-20S	No	5.16E-01	Yes	Yes	>PRG
Toluene	108-88-3	mg/kg	59 : 79	75	4.46E+00	2.90E-04	1.90E+02	AOC13SB2	No	6.60E+01	Yes	Yes	>PRG
TOTAL PCBs	Total PCBs	mg/kg	30 : 79	38	2.19E+00	5.08E-02	3.36E+01	AOC13SB38	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	51 : 79	65	9.21E+00	5.07E-04	3.50E+02	AOC13SB2	No	2.71E+01	Yes	Yes	>PRG
Trichloroethene	79-01-6	mg/kg	5 : 79	6	6.98E-03	3.20E-04	3.20E-02	AOC13SB52	No	5.30E-02	No	No	</=PRG
Trichlorofluoromethan	75-69-4	mg/kg	7 : 79	9	1.51E-03	3.70E-04	3.80E-03	AOC13SB19	No	3.86E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	79 : 79	100	2.10E+01	1.57E+00	5.95E+01	AOC13SB9	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	78 : 79	99	7.24E+01	2.30E+00	5.08E+02	MW-25S	No	2.35E+03	No	No	</=PRG
S. Exposure Area Rev													
1,1,1-Trichloroethane	71-55-6	mg/kg	1 : 253	0	2.30E-03	2.30E-03	2.30E-03	BGSB1	No	2.00E+02	No	No	</=PRG
1,1-Biphenyl	92-52-4	mg/kg	17 : 237	7	1.38E+01	3.90E-02	2.20E+02	MW-1S	No	3.01E+02	No	No	</=PRG
1,2,4-Trichlorobenzen	120-82-1	mg/kg	3 : 252	1	1.13E-03	8.90E-04	1.50E-03	BBSB6	No	6.22E+00	No	No	</=PRG
1,2-Dichlorobenzene	95-50-1	mg/kg	2 : 252	1	4.10E-04	3.00E-04	5.20E-04	BBSB6	No	1.10E+02	No	No	</=PRG
1,3-Dichlorobenzene	541-73-1	mg/kg	3 : 252	1	1.92E-03	4.00E-04	4.90E-03	AOC14SB4	No	5.31E+01	No	No	</=PRG
1,4-Dichlorobenzene	106-46-7	mg/kg	1 : 252	0	1.00E-03	1.00E-03	1.00E-03	AOC14SB4	No	3.45E+00	No	No	</=PRG
1-METHYLNAPHTHA	90-12-0	mg/kg	9 : 14	64	1.00E-01	1.49E-02	2.58E-01	MW-23S	No	5.59E+00	No	No	</=PRG
2-Butanone	78-93-3	mg/kg	86 : 253	34	1.55E-02	1.10E-03	2.70E-01	AOC8SB10	No	2.23E+03	No	No	</=PRG
2-Hexanone	591-78-6	mg/kg	3 : 252	1	1.40E-03	1.20E-03	1.80E-03	BBSB6	No	5.28E+02	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	90 : 237	38	1.06E+01	1.78E-02	8.80E+02	MW-1S	No	5.59E+00	Yes	Yes	>PRG
4-Methyl-2-pentanone	108-10-1	mg/kg	3 : 253	1	2.70E-03	6.10E-04	6.30E-03	BCSB10	No	5.28E+02	No	No	</=PRG
Acenaphthene	83-32-9	mg/kg	46 : 238	19	3.07E+00	1.16E-02	1.00E+02	MW-1S	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	119 : 238	50	1.07E+01	6.22E-03	1.10E+03	MW-1S	No	3.68E+02	Yes	Yes	>PRG
Acetone	67-64-1	mg/kg	167 : 253	66	3.14E-02	2.90E-03	3.90E-01	BGSB2	No	1.41E+03	No	No	</=PRG
Acetophenone	98-86-2	mg/kg	2 : 237	1	1.84E-01	1.38E-01	2.30E-01	AOC9SB2	No	7.80E+02	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	240 : 240	100	1.76E+04	2.03E+03	2.49E+05	AOC20CA3	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	133 : 238	56	1.10E+01	3.57E-02	1.20E+03	MW-1S	No	2.19E+03	No	No	</=PRG
Antimony	7440-36-0	mg/kg	33 : 221	15	9.33E+00	3.93E-01	1.05E+02	BFSB4	No	3.13E+00	Yes	Yes	>PRG
Arsenic	7440-38-2	mg/kg	227 : 240	95	9.04E+00	4.74E-01	5.10E+01	BCSB12	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	240 : 240	100	1.62E+02	1.14E+01	1.44E+03	AOC20CA3	No	5.37E+02	Yes	Yes	>PRG
Benzene	71-43-2	mg/kg	179 : 254	70	1.04E-02	2.90E-04	1.30E+00	AOC12SB4	No	6.43E-01	Yes	Yes	>PRG
Benzo(a)anthracene	56-55-3	mg/kg	181 : 238	76	8.79E+00	5.90E-03	1.10E+03	MW-1S	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	181 : 238	76	7.17E+00	1.17E-02	8.50E+02	MW-1S	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	179 : 238	75	6.11E+00	9.04E-03	6.90E+02	MW-1S	No	6.21E-01	Yes	Yes	>PRG

TABLE B-2b
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL - AOC 13 AND SOUTHERN PARCEL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Benzo(g,h,i)perylene	191-24-2	mg/kg	176 : 238	74	4.14E+00	7.94E-03	4.10E+02	MW-1S	No	2.32E+02	Yes	Yes	>PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	179 : 238	75	6.81E+00	5.66E-03	8.20E+02	MW-1S	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	134 : 240	56	3.19E+00	1.14E-01	1.35E+01	BCSB5	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phtha	117-81-7	mg/kg	23 : 237	10	3.77E-01	3.70E-02	5.30E+00	BDSB8	No	3.47E+01	No	No	</=PRG
Butylbenzylphthalate	85-68-7	mg/kg	1 : 237	0	1.50E+00	1.50E+00	1.50E+00	BDSB8	No	1.22E+03	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	132 : 240	55	2.08E+00	1.35E-01	1.09E+01	BCSB13	No	3.70E+00	Yes	Yes	>PRG
Calcium	7440-70-2	mg/kg	240 : 240	100	1.08E+05	2.42E+03	2.77E+05	AOC14SB3	Yes	NA	–	No	EN
Carbazole	86-74-8	mg/kg	69 : 237	29	9.89E+00	4.20E-02	6.00E+02	MW-1S	No	2.43E+01	Yes	Yes	>PRG
Carbon disulfide	75-15-0	mg/kg	181 : 253	72	3.30E-03	2.80E-04	5.90E-02	BBSB8	No	3.55E+01	No	No	</=PRG
Chlorobenzene	108-90-7	mg/kg	3 : 252	1	1.82E-02	4.60E-04	3.10E-02	AOC14SB4	No	1.51E+01	No	No	</=PRG
Chloroform	67-66-3	mg/kg	13 : 253	5	3.95E-04	3.20E-04	5.60E-04	BDSB5	No	2.21E-01	No	No	</=PRG
Chloromethane	74-87-3	mg/kg	23 : 253	9	3.52E-03	3.20E-04	6.10E-02	AOC8SB11	No	4.69E+00	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	240 : 240	100	4.62E+01	3.10E+00	3.73E+03	BFSB4	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	183 : 238	77	6.22E+00	9.36E-03	1.00E+03	MW-1S	No	6.21E+01	Yes	Yes	>PRG
cis-1,2-Dichloroethene	156-59-2	mg/kg	1 : 253	0	3.70E-04	3.70E-04	3.70E-04	AOC14SB4	No	4.29E+00	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	99 : 240	41	8.52E+00	8.45E-01	1.57E+01	BGSB16	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	239 : 240	100	4.46E+01	2.59E+00	1.36E+03	AOC15SB1	No	3.13E+02	Yes	Yes	>PRG
CYANIDE	57-12-5	mg/kg	83 : 225	37	2.99E+00	1.12E+00	1.48E+01	BCSB9	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	165 : 253	65	5.49E-03	3.80E-04	1.60E-01	AOC20CA9SB2	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracen	53-70-3	mg/kg	124 : 238	52	1.74E+00	2.63E-02	1.30E+02	MW-1S	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	76 : 237	32	1.34E+01	3.70E-02	9.20E+02	MW-1S	No	1.45E+01	Yes	Yes	>PRG
Dichlorodifluorometha	75-71-8	mg/kg	2 : 253	1	5.00E-04	4.20E-04	5.80E-04	MW-1S	No	9.39E+00	No	No	</=PRG
Di-n-butylphthalate	84-74-2	mg/kg	6 : 237	3	5.45E-02	3.80E-02	7.60E-02	AOC8SB1	No	6.11E+02	No	No	</=PRG
Di-n-octylphthalate	117-84-0	mg/kg	1 : 237	0	1.10E-01	1.10E-01	1.10E-01	BGSB2	No	2.44E+02	No	No	</=PRG
Dioxin TEQ-HH	Dioxin TEQ	mg/kg	70 : 74	95	7.15E-08	6.39E-08	1.50E-04	AOC9SB3	No	3.90E-08	Yes	Yes	>PRG
Ethylbenzene	100-41-4	mg/kg	103 : 254	41	5.98E-03	3.00E-04	2.30E-01	AOC20CA9SB2	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	191 : 238	80	2.07E+01	1.17E-02	2.90E+03	MW-1S	No	2.29E+02	Yes	Yes	>PRG
Fluorene	86-73-7	mg/kg	72 : 238	30	2.44E+01	1.35E-02	1.60E+03	MW-1S	No	2.75E+02	Yes	Yes	>PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	169 : 238	71	3.92E+00	4.10E-02	3.90E+02	MW-1S	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	240 : 240	100	3.92E+04	4.25E+03	3.97E+05	BCSB13	No	2.35E+03	Yes	Yes	>PRG
Isopropylbenzene	98-82-8	mg/kg	33 : 252	13	3.81E-02	3.00E-04	6.70E-01	BDSB6	No	1.57E+01	No	No	</=PRG
Lead	7439-92-1	mg/kg	228 : 240	95	5.61E+01	1.86E+00	1.33E+03	AOC15SB2	No	4.00E+02	Yes	Yes	>PRG
Magnesium	7439-95-4	mg/kg	240 : 240	100	2.98E+04	1.08E+03	8.87E+04	BDSB2	Yes	NA	–	No	EN
Manganese	7439-96-5	mg/kg	240 : 240	100	2.26E+03	8.40E+01	2.07E+04	BCSB13	No	1.76E+02	Yes	Yes	>PRG

TABLE B-2b
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL - AOC 13 AND SOUTHERN PARCEL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Mercury	7439-97-6	mg/kg	113 : 235	48	4.38E-01	2.71E-02	1.44E+01	BBSB4	No	2.30E+00	Yes	Yes	>PRG
Methyl acetate	79-20-9	mg/kg	8 : 253	3	7.93E-02	1.30E-03	2.00E-01	BDSB6	No	2.21E+03	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	189 : 253	75	2.07E-02	3.60E-04	2.00E+00	AOC20CA9SB2	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	72 : 253	28	2.54E-03	2.90E-04	8.70E-02	AOC20CA9SB2	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	107 : 238	45	4.83E+01	1.62E-02	5.00E+03	MW-1S	No	5.59E+00	Yes	Yes	>PRG
Nickel	7440-02-0	mg/kg	220 : 240	92	1.64E+01	4.80E+00	7.27E+01	MW-6S	No	1.56E+02	No	No	</=PRG
o-Cresol (2-Methylphe	95-48-7	mg/kg	2 : 235	1	8.55E-02	7.80E-02	9.30E-02	AOC11TP1BS	No	3.06E+02	No	No	</=PRG
p-Cresol (4-Methylphe	106-44-5	mg/kg	3 : 235	1	5.34E-01	9.30E-02	9.90E-01	AOC11TP1BS	No	3.06E+01	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	181 : 238	76	2.79E+01	3.01E-02	4.20E+03	MW-1S	No	2.19E+03	Yes	Yes	>PRG
Phenol	108-95-2	mg/kg	8 : 235	3	1.20E+00	4.00E-02	8.10E+00	AOC11TP1BS	No	1.83E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	231 : 240	96	1.81E+03	2.57E+02	5.85E+04	AOC20CA3	Yes	NA	--	No	EN
Pyrene	129-00-0	mg/kg	192 : 238	81	1.68E+01	1.63E-02	2.40E+03	MW-1S	No	2.32E+02	Yes	Yes	>PRG
Selenium	7782-49-2	mg/kg	109 : 240	45	4.40E+00	8.20E-01	3.89E+01	BFSB4	No	3.91E+01	No	No	</=PRG
Silver	7440-22-4	mg/kg	23 : 240	10	3.53E+00	2.89E-01	3.58E+01	AOC15SB1	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	222 : 240	93	5.65E+02	5.69E+01	6.06E+03	MW-26S	Yes	NA	--	No	EN
Styrene	100-42-5	mg/kg	1 : 252	0	1.10E-03	1.10E-03	1.10E-03	BGSB14	No	4.40E+02	No	No	</=PRG
Tetrachloroethene	127-18-4	mg/kg	11 : 252	4	1.38E-03	3.30E-04	4.20E-03	AOC20CA8SB1	No	4.84E-01	No	No	</=PRG
Thallium	7440-28-0	mg/kg	11 : 240	5	1.86E-01	6.47E-02	3.98E-01	MW-24S	No	5.16E-01	No	No	</=PRG
Toluene	108-88-3	mg/kg	180 : 254	71	1.33E-02	2.70E-04	1.50E+00	AOC12SB4	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	112 : 237	47	5.60E-01	4.88E-02	7.28E+00	BBSB1	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	116 : 254	46	1.88E-02	5.58E-04	8.60E-01	AOC20CA9SB2	No	2.71E+01	No	No	</=PRG
Trichloroethene	79-01-6	mg/kg	12 : 253	5	4.56E-03	3.40E-04	4.70E-02	AOC8SB7	No	5.30E-02	No	No	</=PRG
Trichlorofluoromethan	75-69-4	mg/kg	19 : 253	8	1.04E-03	3.80E-04	3.50E-03	BGSB1	No	3.86E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	239 : 240	100	2.80E+01	6.70E+00	4.85E+02	BFSB4	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	237 : 239	99	2.15E+02	4.90E+00	7.24E+03	AOC15SB1	No	2.35E+03	Yes	Yes	>PRG

TABLE B-2b
COPC SCREENING - COMBINED SURFACE AND SUBSURFACE SOIL - AOC 13 AND SOUTHERN PARCEL
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason

Notes:
CAS - Chemical Abstracts Service.
COPC - Chemical of potential
EN - Essential nutrient.
FOD - Frequency of detection.
NA - Not available.
USEPA - United States Environmental Protection Agency.
(a) Frequency of Detection = Number of detected samples: Total number of samples.
(b) Percent of detected samples out of samples collected.
(c) Essential nutrients are not included as COPCs (calcium, magnesium, potassium, sodium).
(d) USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for residential soil. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects. See Table B-6 for detailed references.
(e) A chemical is identified as a COPC if it is not an essential nutrient, has an FOD greater than 5% (where 20 samples are available) and if the maximum detected concentration is greater than the PRG.

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 1	MW-11S	Barium	7440-39-3	1 : 1	60.8	2.55E+02	No	NA	No
AOC 1	MW-11S	Calcium	7440-70-2	1 : 1	156000	NA	No	NA	No
AOC 1	MW-11S	CYANIDE	57-12-5	2 : 2	34	7.30E+01	No	NA	No
AOC 1	MW-11S	Iron	7439-89-6	1 : 1	135	1.09E+03	No	NA	No
AOC 1	MW-11S	Magnesium	7439-95-4	1 : 1	55200	NA	No	NA	No
AOC 1	MW-11S	Manganese	7439-96-5	1 : 1	77.5	8.76E+01	No	NA	No
AOC 1	MW-11S	Potassium	7440-09-7	1 : 1	31100	NA	No	NA	No
AOC 1	MW-11S	Selenium	7782-49-2	1 : 1	7.2	1.82E+01	No	NA	No
AOC 1	MW-11S	Sodium	7440-23-5	1 : 1	35400	NA	No	NA	No
AOC 1	MW-11S	Fluoranthene	206-44-0	1 : 2	0.07	1.46E+02	No	NA	No
AOC 1	MW-11S	Toluene	108-88-3	1 : 2	0.5	7.23E+01	No	150	No
AOC 1	MW-12S	Aluminum	7429-90-5	1 : 1	13600	3.65E+03	Yes	NA	No
AOC 1	MW-12S	Barium	7440-39-3	1 : 1	153	2.55E+02	No	NA	No
AOC 1	MW-12S	Calcium	7440-70-2	1 : 1	220000	NA	No	NA	No
AOC 1	MW-12S	Chromium (total)	7440-47-3	1 : 1	22.6	1.10E+01	Yes	NA	No
AOC 1	MW-12S	CYANIDE	57-12-5	1 : 2	9.31	7.30E+01	No	NA	No
AOC 1	MW-12S	Iron	7439-89-6	1 : 1	19100	1.09E+03	Yes	NA	No
AOC 1	MW-12S	Lead	7439-92-1	1 : 1	12.7	1.50E+01	No	NA	No
AOC 1	MW-12S	Magnesium	7439-95-4	1 : 1	75400	NA	No	NA	No
AOC 1	MW-12S	Manganese	7439-96-5	1 : 1	793	8.76E+01	Yes	NA	No
AOC 1	MW-12S	Mercury	7439-97-6	1 : 1	0.02	1.10E+00	No	NA	No
AOC 1	MW-12S	Potassium	7440-09-7	1 : 1	14500	NA	No	NA	No
AOC 1	MW-12S	Selenium	7782-49-2	1 : 1	6.8	1.82E+01	No	NA	No
AOC 1	MW-12S	Sodium	7440-23-5	1 : 1	30400	NA	No	NA	No
AOC 1	MW-12S	Vanadium	7440-62-2	1 : 1	27.5	3.65E+00	Yes	NA	No
AOC 1	MW-12S	Zinc	7440-66-6	1 : 1	63.4	1.09E+03	No	NA	No
AOC 1	MW-12S	Caprolactam	105-60-2	1 : 2	48	1.82E+03	No	NA	No
AOC 1	MW-12S	Fluoranthene	206-44-0	1 : 2	0.05	1.46E+02	No	NA	No
AOC 1	MW-12S	Phenanthrene	85-01-8	1 : 2	0.11	1.80E+02	No	NA	No
AOC 1	MW-12S	Pyrene	129-00-0	1 : 2	0.06	1.83E+01	No	NA	No
AOC 1	MW-12S	Methylcyclohexane	108-87-2	1 : 2	0.973	5.22E+02	No	71	No
AOC 1	MW-12S	Toluene	108-88-3	2 : 2	0.36	7.23E+01	No	150	No
AOC 1	MW-16S	Barium	7440-39-3	1 : 1	53.9	2.55E+02	No	NA	No
AOC 1	MW-16S	Calcium	7440-70-2	1 : 1	94200	NA	No	NA	No
AOC 1	MW-16S	Iron	7439-89-6	1 : 1	49.3	1.09E+03	No	NA	No
AOC 1	MW-16S	Magnesium	7439-95-4	1 : 1	32700	NA	No	NA	No
AOC 1	MW-16S	Manganese	7439-96-5	1 : 1	49.4	8.76E+01	No	NA	No
AOC 1	MW-16S	Potassium	7440-09-7	1 : 1	3560	NA	No	NA	No
AOC 1	MW-16S	Sodium	7440-23-5	1 : 1	19600	NA	No	NA	No
AOC 1	MW-16S	Toluene	108-88-3	1 : 2	0.41	7.23E+01	No	150	No
AOC 1	MW-17M	CYANIDE	57-12-5	1 : 1	12.7	7.30E+01	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 1	MW-17M	1-METHYLNAPHTHALENE	90-12-0	1 : 1	0.0711	6.20E-01	No	330	No
AOC 1	MW-17M	2-Methylnaphthalene	91-57-6	1 : 1	0.108	6.20E-01	No	330	No
AOC 1	MW-17M	Bis(2-Ethylhexyl)phthalate	117-81-7	1 : 1	9.65	4.80E+00	Yes	NA	No
AOC 1	MW-17M	Di-n-butylphthalate	84-74-2	1 : 1	3.61	3.65E+02	No	NA	No
AOC 1	MW-17M	Phenanthrene	85-01-8	1 : 1	0.0743	1.80E+02	No	NA	No
AOC 1	MW-17S	Arsenic	7440-38-2	1 : 2	0.462	4.48E-02	Yes	NA	No
AOC 1	MW-17S	Barium	7440-39-3	2 : 2	80.6	2.55E+02	No	NA	No
AOC 1	MW-17S	Calcium	7440-70-2	2 : 2	207000	NA	No	NA	No
AOC 1	MW-17S	Cobalt	7440-48-4	1 : 2	1.49	7.30E+01	No	NA	No
AOC 1	MW-17S	CYANIDE	57-12-5	2 : 2	130	7.30E+01	Yes	NA	No
AOC 1	MW-17S	Iron	7439-89-6	2 : 2	172	1.09E+03	No	NA	No
AOC 1	MW-17S	Magnesium	7439-95-4	2 : 2	89200	NA	No	NA	No
AOC 1	MW-17S	Manganese	7439-96-5	2 : 2	675	8.76E+01	Yes	NA	No
AOC 1	MW-17S	Nickel	7440-02-0	1 : 2	11.1	7.30E+01	No	NA	No
AOC 1	MW-17S	Potassium	7440-09-7	2 : 2	20500	NA	No	NA	No
AOC 1	MW-17S	Selenium	7782-49-2	2 : 2	8	1.82E+01	No	NA	No
AOC 1	MW-17S	Sodium	7440-23-5	2 : 2	25400	NA	No	NA	No
AOC 1	MW-17S	Thallium	7440-28-0	1 : 2	0.0565	2.41E-01	No	NA	No
AOC 1	MW-17S	Anthracene	120-12-7	1 : 2	0.062	1.83E+02	No	NA	No
AOC 1	MW-17S	Di-n-butylphthalate	84-74-2	1 : 2	3.4	3.65E+02	No	NA	No
AOC 1	MW-17S	Phenanthrene	85-01-8	1 : 2	0.1	1.80E+02	No	NA	No
AOC 1	MW-17S	Acetone	67-64-1	1 : 2	4.6	5.48E+02	No	22000	No
AOC 1	MW-17S	Chloromethane	74-87-3	1 : 2	0.289	1.58E+01	No	6.7	No
AOC 1	MW-17S	Toluene	108-88-3	1 : 2	0.48	7.23E+01	No	150	No
AOC 13	MW-20M	Aluminum	7429-90-5	1 : 2	41.7	3.65E+03	No	NA	No
AOC 13	MW-20M	Arsenic	7440-38-2	1 : 2	2.62	4.48E-02	Yes	NA	No
AOC 13	MW-20M	Barium	7440-39-3	2 : 2	110	2.55E+02	No	NA	No
AOC 13	MW-20M	Calcium	7440-70-2	2 : 2	73600	NA	No	NA	No
AOC 13	MW-20M	Chromium (total)	7440-47-3	1 : 2	2.41	1.10E+01	No	NA	No
AOC 13	MW-20M	Copper	7440-50-8	1 : 2	2.09	1.46E+02	No	NA	No
AOC 13	MW-20M	CYANIDE	57-12-5	1 : 2	6.37	7.30E+01	No	NA	No
AOC 13	MW-20M	Iron	7439-89-6	2 : 2	1810	1.09E+03	Yes	NA	No
AOC 13	MW-20M	Magnesium	7439-95-4	2 : 2	31900	NA	No	NA	No
AOC 13	MW-20M	Manganese	7439-96-5	2 : 2	119	8.76E+01	Yes	NA	No
AOC 13	MW-20M	Mercury	7439-97-6	1 : 2	0.1	1.10E+00	No	NA	No
AOC 13	MW-20M	Nickel	7440-02-0	1 : 2	2.44	7.30E+01	No	NA	No
AOC 13	MW-20M	Potassium	7440-09-7	2 : 2	3340	NA	No	NA	No
AOC 13	MW-20M	Sodium	7440-23-5	2 : 2	12000	NA	No	NA	No
AOC 13	MW-20M	Naphthalene	91-20-3	1 : 2	0.091	6.20E-01	No	15	No
AOC 13	MW-20M	Acetone	67-64-1	1 : 2	3.7	5.48E+02	No	22000	No
AOC 13	MW-20S	Calcium	7440-70-2	1 : 1	477000	NA	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 13	MW-20S	CYANIDE	57-12-5	2 : 2	121	7.30E+01	Yes	NA	No
AOC 13	MW-20S	Iron	7439-89-6	1 : 1	174	1.09E+03	No	NA	No
AOC 13	MW-20S	Magnesium	7439-95-4	1 : 1	91600	NA	No	NA	No
AOC 13	MW-20S	Manganese	7439-96-5	1 : 1	408	8.76E+01	Yes	NA	No
AOC 13	MW-20S	Potassium	7440-09-7	1 : 1	5360	NA	No	NA	No
AOC 13	MW-20S	Selenium	7782-49-2	1 : 1	14.2	1.82E+01	No	NA	No
AOC 13	MW-20S	Sodium	7440-23-5	1 : 1	57400	NA	No	NA	No
AOC 13	MW-20S	2,4-Dimethylphenol	105-67-9	1 : 2	2.4	7.30E+01	No	NA	No
AOC 13	MW-20S	2-Methylnaphthalene	91-57-6	1 : 2	1	6.20E-01	Yes	330	No
AOC 13	MW-20S	Acenaphthene	83-32-9	1 : 2	0.48	3.65E+01	No	NA	No
AOC 13	MW-20S	Acenaphthylene	208-96-8	2 : 2	3.2	3.65E+01	No	NA	No
AOC 13	MW-20S	Anthracene	120-12-7	2 : 2	0.58	1.83E+02	No	NA	No
AOC 13	MW-20S	Benzo(a)anthracene	56-55-3	2 : 2	0.133	9.21E-02	Yes	NA	No
AOC 13	MW-20S	Benzo(a)pyrene	50-32-8	2 : 2	0.18	9.21E-03	Yes	NA	No
AOC 13	MW-20S	Benzo(b)fluoranthene	205-99-2	1 : 2	0.074	9.21E-02	No	NA	No
AOC 13	MW-20S	Benzo(k)fluoranthene	207-08-9	1 : 2	0.0875	9.21E-01	No	NA	No
AOC 13	MW-20S	Carbazole	86-74-8	1 : 2	5.2	3.36E+00	Yes	NA	No
AOC 13	MW-20S	Chrysene	218-01-9	2 : 2	0.1045	9.21E+00	No	NA	No
AOC 13	MW-20S	Dibenzofuran	132-64-9	1 : 2	2.6	1.22E+00	Yes	NA	No
AOC 13	MW-20S	Fluoranthene	206-44-0	2 : 2	0.62	1.46E+02	No	NA	No
AOC 13	MW-20S	Fluorene	86-73-7	2 : 2	3.8	2.43E+01	No	NA	No
AOC 13	MW-20S	Naphthalene	91-20-3	1 : 2	1.4	6.20E-01	Yes	15	No
AOC 13	MW-20S	o-Cresol (2-Methylphenol)	95-48-7	1 : 2	8.8	1.82E+02	No	NA	No
AOC 13	MW-20S	p-Cresol (4-Methylphenol)	106-44-5	1 : 2	2.5	1.82E+01	No	NA	No
AOC 13	MW-20S	Phenanthrene	85-01-8	2 : 2	2.9	1.80E+02	No	NA	No
AOC 13	MW-20S	Pyrene	129-00-0	2 : 2	0.38	1.83E+01	No	NA	No
AOC 13	MW-20S	Benzene	71-43-2	1 : 2	9.7	3.54E-01	Yes	5	Yes
AOC 13	MW-20S	Styrene	100-42-5	1 : 2	0.48	1.00E+02	No	890	No
AOC 13	MW-20S	Toluene	108-88-3	1 : 2	5.3	7.23E+01	No	150	No
AOC 13	MW-20S	TOTAL XYLENES	TOTAL XYLENES	1 : 2	4.4	2.06E+01	No	2200	No
AOC 13	MW-21M	Aluminum	7429-90-5	1 : 2	160	3.65E+03	No	NA	No
AOC 13	MW-21M	Arsenic	7440-38-2	1 : 2	1.46	4.48E-02	Yes	NA	No
AOC 13	MW-21M	Barium	7440-39-3	2 : 2	299	2.55E+02	Yes	NA	No
AOC 13	MW-21M	Beryllium	7440-41-7	1 : 2	0.601	4.00E+00	No	NA	No
AOC 13	MW-21M	Calcium	7440-70-2	2 : 2	269000	NA	No	NA	No
AOC 13	MW-21M	Cobalt	7440-48-4	1 : 2	2.04	7.30E+01	No	NA	No
AOC 13	MW-21M	Copper	7440-50-8	1 : 2	3.56	1.46E+02	No	NA	No
AOC 13	MW-21M	CYANIDE	57-12-5	2 : 2	9920	7.30E+01	Yes	NA	No
AOC 13	MW-21M	Iron	7439-89-6	2 : 2	3390	1.09E+03	Yes	NA	No
AOC 13	MW-21M	Magnesium	7439-95-4	2 : 2	75600	NA	No	NA	No
AOC 13	MW-21M	Manganese	7439-96-5	2 : 2	465	8.76E+01	Yes	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 13	MW-21M	Nickel	7440-02-0	1 : 2	11.5	7.30E+01	No	NA	No
AOC 13	MW-21M	Potassium	7440-09-7	2 : 2	8610	NA	No	NA	No
AOC 13	MW-21M	Selenium	7782-49-2	1 : 2	13.6	1.82E+01	No	NA	No
AOC 13	MW-21M	Sodium	7440-23-5	2 : 2	16000	NA	No	NA	No
AOC 13	MW-21M	Zinc	7440-66-6	2 : 2	5.73	1.09E+03	No	NA	No
AOC 13	MW-21M	Acenaphthylene	208-96-8	1 : 2	0.111	3.65E+01	No	NA	No
AOC 13	MW-21M	Anthracene	120-12-7	1 : 2	0.0658	1.83E+02	No	NA	No
AOC 13	MW-21M	Fluoranthene	206-44-0	1 : 2	0.102	1.46E+02	No	NA	No
AOC 13	MW-21M	Fluorene	86-73-7	1 : 2	0.0696	2.43E+01	No	NA	No
AOC 13	MW-21M	Naphthalene	91-20-3	1 : 2	0.491	6.20E-01	No	15	No
AOC 13	MW-21M	Phenanthrene	85-01-8	1 : 2	0.066	1.80E+02	No	NA	No
AOC 13	MW-21M	Pyrene	129-00-0	1 : 2	0.0754	1.83E+01	No	NA	No
AOC 13	MW-21M	Acetone	67-64-1	1 : 2	2.9	5.48E+02	No	22000	No
AOC 13	MW-21M	Benzene	71-43-2	2 : 2	4.68	3.54E-01	Yes	5	No
AOC 13	MW-21M	cis-1,2-Dichloroethene	156-59-2	1 : 2	0.39	6.08E+00	No	21	No
AOC 13	MW-21S	Aluminum	7429-90-5	1 : 2	6330	3.65E+03	Yes	NA	No
AOC 13	MW-21S	Antimony	7440-36-0	1 : 2	3.19	1.46E+00	Yes	NA	No
AOC 13	MW-21S	Arsenic	7440-38-2	1 : 2	85.4	4.48E-02	Yes	NA	No
AOC 13	MW-21S	Barium	7440-39-3	1 : 2	365	2.55E+02	Yes	NA	No
AOC 13	MW-21S	Beryllium	7440-41-7	1 : 2	0.506	4.00E+00	No	NA	No
AOC 13	MW-21S	Cadmium	7440-43-9	1 : 2	0.387	1.82E+00	No	NA	No
AOC 13	MW-21S	Calcium	7440-70-2	2 : 2	301000	NA	No	NA	No
AOC 13	MW-21S	Chromium (total)	7440-47-3	1 : 2	15.2	1.10E+01	Yes	NA	No
AOC 13	MW-21S	Cobalt	7440-48-4	1 : 2	4.45	7.30E+01	No	NA	No
AOC 13	MW-21S	Copper	7440-50-8	1 : 2	15.3	1.46E+02	No	NA	No
AOC 13	MW-21S	CYANIDE	57-12-5	2 : 2	8130	7.30E+01	Yes	NA	No
AOC 13	MW-21S	Iron	7439-89-6	2 : 2	10300	1.09E+03	Yes	NA	No
AOC 13	MW-21S	Lead	7439-92-1	1 : 2	17.3	1.50E+01	Yes	NA	No
AOC 13	MW-21S	Magnesium	7439-95-4	2 : 2	113000	NA	No	NA	No
AOC 13	MW-21S	Manganese	7439-96-5	2 : 2	248	8.76E+01	Yes	NA	No
AOC 13	MW-21S	Nickel	7440-02-0	1 : 2	15.9	7.30E+01	No	NA	No
AOC 13	MW-21S	Potassium	7440-09-7	2 : 2	5130	NA	No	NA	No
AOC 13	MW-21S	Selenium	7782-49-2	2 : 2	14.6	1.82E+01	No	NA	No
AOC 13	MW-21S	Silver	7440-22-4	1 : 2	0.273	1.82E+01	No	NA	No
AOC 13	MW-21S	Sodium	7440-23-5	2 : 2	15100	NA	No	NA	No
AOC 13	MW-21S	Thallium	7440-28-0	1 : 2	0.119	2.41E-01	No	NA	No
AOC 13	MW-21S	Zinc	7440-66-6	1 : 2	338	1.09E+03	No	NA	No
AOC 13	MW-21S	1,1-Biphenyl	92-52-4	1 : 2	2.4	3.04E+01	No	NA	No
AOC 13	MW-21S	2,4-Dimethylphenol	105-67-9	1 : 2	6	7.30E+01	No	NA	No
AOC 13	MW-21S	2-Methylnaphthalene	91-57-6	1 : 2	15	6.20E-01	Yes	330	No
AOC 13	MW-21S	Acenaphthene	83-32-9	1 : 2	0.66	3.65E+01	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 13	MW-21S	Acenaphthylene	208-96-8	1 : 2	2.9	3.65E+01	No	NA	No
AOC 13	MW-21S	Acetophenone	98-86-2	1 : 2	2	6.10E+01	No	80000	No
AOC 13	MW-21S	Anthracene	120-12-7	1 : 2	0.39	1.83E+02	No	NA	No
AOC 13	MW-21S	Dibenzofuran	132-64-9	1 : 2	2.4	1.22E+00	Yes	NA	No
AOC 13	MW-21S	Fluoranthene	206-44-0	2 : 2	0.19	1.46E+02	No	NA	No
AOC 13	MW-21S	Fluorene	86-73-7	1 : 2	0.97	2.43E+01	No	NA	No
AOC 13	MW-21S	Naphthalene	91-20-3	1 : 2	210	6.20E-01	Yes	15	Yes
AOC 13	MW-21S	o-Cresol (2-Methylphenol)	95-48-7	1 : 2	3.2	1.82E+02	No	NA	No
AOC 13	MW-21S	p-Cresol (4-Methylphenol)	106-44-5	1 : 2	9	1.82E+01	No	NA	No
AOC 13	MW-21S	Phenanthrene	85-01-8	1 : 2	1.1	1.80E+02	No	NA	No
AOC 13	MW-21S	Phenol	108-95-2	1 : 2	13	1.09E+03	No	NA	No
AOC 13	MW-21S	Pyrene	129-00-0	2 : 2	0.12	1.83E+01	No	NA	No
AOC 13	MW-21S	Benzene	71-43-2	1 : 2	150	3.54E-01	Yes	5	Yes
AOC 13	MW-21S	Carbon disulfide	75-15-0	1 : 2	10	1.04E+02	No	56	No
AOC 13	MW-21S	cis-1,2-Dichloroethene	156-59-2	1 : 2	0.261	6.08E+00	No	21	No
AOC 13	MW-21S	Ethylbenzene	100-41-4	1 : 2	7.7	1.34E+02	No	700	No
AOC 13	MW-21S	Isopropylbenzene	98-82-8	1 : 2	9	6.58E+01	No	0.84	Yes
AOC 13	MW-21S	Styrene	100-42-5	1 : 2	5	1.00E+02	No	890	No
AOC 13	MW-21S	Toluene	108-88-3	1 : 2	86	7.23E+01	Yes	150	No
AOC 13	MW-21S	Vinyl chloride	75-01-4	1 : 2	0.839	1.98E-02	Yes	2	No
AOC 13	MW-21S	TOTAL XYLENES	TOTAL XYLENES	1 : 2	237	2.06E+01	Yes	2200	No
AOC 13	MW-25S	1-METHYLNAPHTHALENE	90-12-0	1 : 1	0.067	6.20E-01	No	330	No
AOC 13	MW-25S	Acenaphthene	83-32-9	1 : 1	10.3	3.65E+01	No	NA	No
AOC 13	MW-25S	Acenaphthylene	208-96-8	1 : 1	0.197	3.65E+01	No	NA	No
AOC 13	MW-25S	Anthracene	120-12-7	1 : 1	0.0692	1.83E+02	No	NA	No
AOC 13	MW-25S	Fluoranthene	206-44-0	1 : 1	0.14	1.46E+02	No	NA	No
AOC 13	MW-25S	Fluorene	86-73-7	1 : 1	1.28	2.43E+01	No	NA	No
AOC 13	MW-25S	Naphthalene	91-20-3	1 : 1	0.0975	6.20E-01	No	15	No
AOC 13	MW-25S	Pyrene	129-00-0	1 : 1	0.147	1.83E+01	No	NA	No
AOC 13	MW-27M	CYANIDE	57-12-5	1 : 1	3820	7.30E+01	Yes	NA	No
AOC 13	MW-27M	1,1-Biphenyl	92-52-4	1 : 1	35.2	3.04E+01	Yes	NA	No
AOC 13	MW-27M	1-METHYLNAPHTHALENE	90-12-0	1 : 1	158.5	6.20E-01	Yes	330	No
AOC 13	MW-27M	2-Methylnaphthalene	91-57-6	1 : 1	342	6.20E-01	Yes	330	Yes
AOC 13	MW-27M	Acenaphthene	83-32-9	1 : 1	11.15	3.65E+01	No	NA	No
AOC 13	MW-27M	Acenaphthylene	208-96-8	1 : 1	50.35	3.65E+01	Yes	NA	No
AOC 13	MW-27M	Anthracene	120-12-7	1 : 1	8.235	1.83E+02	No	NA	No
AOC 13	MW-27M	Benzo(a)anthracene	56-55-3	1 : 1	1.545	9.21E-02	Yes	NA	No
AOC 13	MW-27M	Benzo(a)pyrene	50-32-8	1 : 1	1.0065	9.21E-03	Yes	NA	No
AOC 13	MW-27M	Benzo(b)fluoranthene	205-99-2	1 : 1	3.36	9.21E-02	Yes	NA	No
AOC 13	MW-27M	Benzo(g,h,i)perylene	191-24-2	1 : 1	0.596	1.83E+01	No	NA	No
AOC 13	MW-27M	Benzo(k)fluoranthene	207-08-9	1 : 1	0.9815	9.21E-01	Yes	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 13	MW-27M	Bis(2-Ethylhexyl)phthalate	117-81-7	1 : 1	4.955	4.80E+00	Yes	NA	No
AOC 13	MW-27M	Carbazole	86-74-8	1 : 1	3.36	3.36E+00	Yes	NA	No
AOC 13	MW-27M	Chrysene	218-01-9	1 : 1	1.3705	9.21E+00	No	NA	No
AOC 13	MW-27M	Dibenz(a,h)anthracene	53-70-3	1 : 1	0.215	9.21E-03	Yes	NA	No
AOC 13	MW-27M	Dibenzofuran	132-64-9	1 : 1	52.95	1.22E+00	Yes	NA	No
AOC 13	MW-27M	Fluoranthene	206-44-0	1 : 1	7.75	1.46E+02	No	NA	No
AOC 13	MW-27M	Fluorene	86-73-7	1 : 1	57.5	2.43E+01	Yes	NA	No
AOC 13	MW-27M	Indeno(1,2,3-cd)pyrene	193-39-5	1 : 1	0.529	9.21E-02	Yes	NA	No
AOC 13	MW-27M	Naphthalene	91-20-3	1 : 1	983.5	6.20E-01	Yes	15	Yes
AOC 13	MW-27M	Phenanthrene	85-01-8	1 : 1	51.25	1.80E+02	No	NA	No
AOC 13	MW-27M	Phenol	108-95-2	1 : 1	11.35	1.09E+03	No	NA	No
AOC 13	MW-27M	Pyrene	129-00-0	1 : 1	4.695	1.83E+01	No	NA	No
AOC 13	MW-27M	Benzene	71-43-2	1 : 1	12.25	3.54E-01	Yes	5	Yes
AOC 13	MW-27M	Ethylbenzene	100-41-4	1 : 1	0.808	1.34E+02	No	700	No
AOC 13	MW-27M	Styrene	100-42-5	1 : 1	0.808	1.00E+02	No	890	No
AOC 13	MW-27M	Toluene	108-88-3	1 : 1	7.455	7.23E+01	No	150	No
AOC 13	MW-27M	TOTAL XYLENES	TOTAL XYLENES	1 : 1	12.25	2.06E+01	No	2200	No
AOC 13	MW-27S	CYANIDE	57-12-5	1 : 1	23.4	7.30E+01	No	NA	No
AOC 13	MW-27S	1,1-Biphenyl	92-52-4	1 : 1	161	3.04E+01	Yes	NA	No
AOC 13	MW-27S	1-METHYLNAPHTHALENE	90-12-0	1 : 1	938	6.20E-01	Yes	330	Yes
AOC 13	MW-27S	2-Methylnaphthalene	91-57-6	1 : 1	1930	6.20E-01	Yes	330	Yes
AOC 13	MW-27S	Acenaphthene	83-32-9	1 : 1	40.3	3.65E+01	Yes	NA	No
AOC 13	MW-27S	Acenaphthylene	208-96-8	1 : 1	215	3.65E+01	Yes	NA	No
AOC 13	MW-27S	Anthracene	120-12-7	1 : 1	11.1	1.83E+02	No	NA	No
AOC 13	MW-27S	Benzo(a)anthracene	56-55-3	1 : 1	0.346	9.21E-02	Yes	NA	No
AOC 13	MW-27S	Benzo(a)pyrene	50-32-8	1 : 1	0.223	9.21E-03	Yes	NA	No
AOC 13	MW-27S	Benzo(b)fluoranthene	205-99-2	1 : 1	0.186	9.21E-02	Yes	NA	No
AOC 13	MW-27S	Benzo(k)fluoranthene	207-08-9	1 : 1	0.437	9.21E-01	No	NA	No
AOC 13	MW-27S	Chrysene	218-01-9	1 : 1	0.299	9.21E+00	No	NA	No
AOC 13	MW-27S	Dibenzofuran	132-64-9	1 : 1	169	1.22E+00	Yes	NA	No
AOC 13	MW-27S	Fluoranthene	206-44-0	1 : 1	2.39	1.46E+02	No	NA	No
AOC 13	MW-27S	Fluorene	86-73-7	1 : 1	86.6	2.43E+01	Yes	NA	No
AOC 13	MW-27S	Naphthalene	91-20-3	1 : 1	12600	6.20E-01	Yes	15	Yes
AOC 13	MW-27S	o-Cresol (2-Methylphenol)	95-48-7	1 : 1	18.9	1.82E+02	No	NA	No
AOC 13	MW-27S	p-Cresol (4-Methylphenol)	106-44-5	1 : 1	35.5	1.82E+01	Yes	NA	No
AOC 13	MW-27S	Phenanthrene	85-01-8	1 : 1	29.5	1.80E+02	No	NA	No
AOC 13	MW-27S	Phenol	108-95-2	1 : 1	53.8	1.09E+03	No	NA	No
AOC 13	MW-27S	Pyrene	129-00-0	1 : 1	1.45	1.83E+01	No	NA	No
AOC 13	MW-27S	1,2,4-Trichlorobenzene	120-82-1	1 : 1	29.3	7.16E-01	Yes	340	No
AOC 13	MW-27S	Benzene	71-43-2	1 : 1	610	3.54E-01	Yes	5	Yes
AOC 13	MW-27S	Ethylbenzene	100-41-4	1 : 1	42.3	1.34E+02	No	700	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 13	MW-27S	Styrene	100-42-5	1 : 1	19.5	1.00E+02	No	890	No
AOC 13	MW-27S	Toluene	108-88-3	1 : 1	336	7.23E+01	Yes	150	Yes
AOC 13	MW-27S	TOTAL XYLENES	TOTAL XYLENES	1 : 1	440	2.06E+01	Yes	2200	No
AOC 13	MW-28S	CYANIDE	57-12-5	1 : 1	7280	7.30E+01	Yes	NA	No
AOC 13	MW-28S	1-METHYLNAPHTHALENE	90-12-0	1 : 1	38.7	6.20E-01	Yes	330	No
AOC 13	MW-28S	2-Methylnaphthalene	91-57-6	1 : 1	16.3	6.20E-01	Yes	330	No
AOC 13	MW-28S	Acenaphthene	83-32-9	1 : 1	11.2	3.65E+01	No	NA	No
AOC 13	MW-28S	Acenaphthylene	208-96-8	1 : 1	14.1	3.65E+01	No	NA	No
AOC 13	MW-28S	Benzo(a)anthracene	56-55-3	1 : 1	0.286	9.21E-02	Yes	NA	No
AOC 13	MW-28S	Chrysene	218-01-9	1 : 1	0.308	9.21E+00	No	NA	No
AOC 13	MW-28S	Fluoranthene	206-44-0	1 : 1	1.9	1.46E+02	No	NA	No
AOC 13	MW-28S	Fluorene	86-73-7	1 : 1	1.47	2.43E+01	No	NA	No
AOC 13	MW-28S	Naphthalene	91-20-3	1 : 1	1040	6.20E-01	Yes	15	Yes
AOC 13	MW-28S	Phenanthrene	85-01-8	1 : 1	11.6	1.80E+02	No	NA	No
AOC 13	MW-28S	Phenol	108-95-2	1 : 1	5.73	1.09E+03	No	NA	No
AOC 13	MW-28S	Pyrene	129-00-0	1 : 1	0.958	1.83E+01	No	NA	No
AOC 13	MW-28S	Benzene	71-43-2	1 : 1	469	3.54E-01	Yes	5	Yes
AOC 13	MW-28S	Carbon disulfide	75-15-0	1 : 1	3.37	1.04E+02	No	56	No
AOC 13	MW-28S	Ethylbenzene	100-41-4	1 : 1	149	1.34E+02	Yes	700	No
AOC 13	MW-28S	Isopropylbenzene	98-82-8	1 : 1	31.5	6.58E+01	No	0.84	Yes
AOC 13	MW-28S	Toluene	108-88-3	1 : 1	141	7.23E+01	Yes	150	No
AOC 13	MW-28S	TOTAL XYLENES	TOTAL XYLENES	1 : 1	462	2.06E+01	Yes	2200	No
AOC 13	MW-29S	Arsenic	7440-38-2	1 : 1	0.836	4.48E-02	Yes	NA	No
AOC 13	MW-29S	Barium	7440-39-3	1 : 1	82.2	2.55E+02	No	NA	No
AOC 13	MW-29S	Calcium	7440-70-2	1 : 1	219000	NA	No	NA	No
AOC 13	MW-29S	Cobalt	7440-48-4	1 : 1	1.48	7.30E+01	No	NA	No
AOC 13	MW-29S	CYANIDE	57-12-5	1 : 1	1280	7.30E+01	Yes	NA	No
AOC 13	MW-29S	Iron	7439-89-6	1 : 1	1890	1.09E+03	Yes	NA	No
AOC 13	MW-29S	Magnesium	7439-95-4	1 : 1	52300	NA	No	NA	No
AOC 13	MW-29S	Manganese	7439-96-5	1 : 1	500	8.76E+01	Yes	NA	No
AOC 13	MW-29S	Nickel	7440-02-0	1 : 1	8.21	7.30E+01	No	NA	No
AOC 13	MW-29S	Potassium	7440-09-7	1 : 1	4570	NA	No	NA	No
AOC 13	MW-29S	Selenium	7782-49-2	1 : 1	1.32	1.82E+01	No	NA	No
AOC 13	MW-29S	Silver	7440-22-4	1 : 1	0.951	1.82E+01	No	NA	No
AOC 13	MW-29S	Sodium	7440-23-5	1 : 1	37900	NA	No	NA	No
AOC 13	MW-29S	1-METHYLNAPHTHALENE	90-12-0	1 : 1	0.296	6.20E-01	No	330	No
AOC 13	MW-29S	Acenaphthene	83-32-9	1 : 1	6.21	3.65E+01	No	NA	No
AOC 13	MW-29S	Acenaphthylene	208-96-8	1 : 1	0.362	3.65E+01	No	NA	No
AOC 13	MW-29S	Anthracene	120-12-7	1 : 1	0.109	1.83E+02	No	NA	No
AOC 13	MW-29S	Fluoranthene	206-44-0	1 : 1	0.177	1.46E+02	No	NA	No
AOC 13	MW-29S	Fluorene	86-73-7	1 : 1	0.236	2.43E+01	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 13	MW-29S	Naphthalene	91-20-3	1 : 1	0.0709	6.20E-01	No	15	No
AOC 13	MW-29S	Pyrene	129-00-0	1 : 1	0.171	1.83E+01	No	NA	No
AOC 13	MW-29S	Benzene	71-43-2	1 : 1	0.638	3.54E-01	Yes	5	No
AOC 13	MW-29S	Isopropylbenzene	98-82-8	1 : 1	2.61	6.58E+01	No	0.84	Yes
AOC 13	MW-31S	Acetone	67-64-1	1 : 1	5.11	5.48E+02	No	22000	No
AOC 13	MW-31S	Carbon disulfide	75-15-0	1 : 1	2.74	1.04E+02	No	56	No
AOC 13	MW-31S	Tetrachloroethene	127-18-4	1 : 1	19.7	1.04E-01	Yes	5	Yes
AOC 13	MW-31S	Trichloroethene	79-01-6	1 : 1	3.58	2.80E-02	Yes	5	No
AOC 13	MW-8M	Aluminum	7429-90-5	2 : 2	52.6	3.65E+03	No	NA	No
AOC 13	MW-8M	Barium	7440-39-3	2 : 2	109	2.55E+02	No	NA	No
AOC 13	MW-8M	Calcium	7440-70-2	2 : 2	117000	NA	No	NA	No
AOC 13	MW-8M	Chromium (total)	7440-47-3	1 : 2	2.25	1.10E+01	No	NA	No
AOC 13	MW-8M	Cobalt	7440-48-4	1 : 2	0.414	7.30E+01	No	NA	No
AOC 13	MW-8M	CYANIDE	57-12-5	2 : 2	67.8	7.30E+01	No	NA	No
AOC 13	MW-8M	Iron	7439-89-6	2 : 2	2090	1.09E+03	Yes	NA	No
AOC 13	MW-8M	Magnesium	7439-95-4	2 : 2	53800	NA	No	NA	No
AOC 13	MW-8M	Manganese	7439-96-5	2 : 2	35.5	8.76E+01	No	NA	No
AOC 13	MW-8M	Nickel	7440-02-0	1 : 2	2.98	7.30E+01	No	NA	No
AOC 13	MW-8M	Potassium	7440-09-7	2 : 2	2710	NA	No	NA	No
AOC 13	MW-8M	Selenium	7782-49-2	1 : 2	0.616	1.82E+01	No	NA	No
AOC 13	MW-8M	Sodium	7440-23-5	2 : 2	14700	NA	No	NA	No
AOC 13	MW-8M	Thallium	7440-28-0	1 : 2	0.0798	2.41E-01	No	NA	No
AOC 13	MW-8M	2-Methylnaphthalene	91-57-6	1 : 2	1.5	6.20E-01	Yes	330	No
AOC 13	MW-8M	Acenaphthene	83-32-9	1 : 2	0.78	3.65E+01	No	NA	No
AOC 13	MW-8M	Anthracene	120-12-7	1 : 2	0.22	1.83E+02	No	NA	No
AOC 13	MW-8M	Benzo(a)pyrene	50-32-8	1 : 2	0.16	9.21E-03	Yes	NA	No
AOC 13	MW-8M	Fluoranthene	206-44-0	2 : 2	0.34	1.46E+02	No	NA	No
AOC 13	MW-8M	Fluorene	86-73-7	1 : 2	0.66	2.43E+01	No	NA	No
AOC 13	MW-8M	Naphthalene	91-20-3	1 : 2	10	6.20E-01	Yes	15	No
AOC 13	MW-8M	Phenanthrene	85-01-8	2 : 2	0.99	1.80E+02	No	NA	No
AOC 13	MW-8M	Pyrene	129-00-0	2 : 2	0.22	1.83E+01	No	NA	No
AOC 13	MW-8M	Acetone	67-64-1	1 : 2	3.1	5.48E+02	No	22000	No
AOC 13	MW-8M	Benzene	71-43-2	1 : 2	0.33	3.54E-01	No	5	No
AOC 13	MW-8S	Aluminum	7429-90-5	1 : 1	3620	3.65E+03	No	NA	No
AOC 13	MW-8S	Barium	7440-39-3	1 : 1	444	2.55E+02	Yes	NA	No
AOC 13	MW-8S	Calcium	7440-70-2	1 : 1	165000	NA	No	NA	No
AOC 13	MW-8S	Chromium (total)	7440-47-3	1 : 1	6.8	1.10E+01	No	NA	No
AOC 13	MW-8S	CYANIDE	57-12-5	2 : 2	525	7.30E+01	Yes	NA	No
AOC 13	MW-8S	Iron	7439-89-6	1 : 1	4460	1.09E+03	Yes	NA	No
AOC 13	MW-8S	Magnesium	7439-95-4	1 : 1	45700	NA	No	NA	No
AOC 13	MW-8S	Manganese	7439-96-5	1 : 1	152	8.76E+01	Yes	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 13	MW-8S	Potassium	7440-09-7	1 : 1	20500	NA	No	NA	No
AOC 13	MW-8S	Sodium	7440-23-5	1 : 1	113000	NA	No	NA	No
AOC 13	MW-8S	1,1-Biphenyl	92-52-4	2 : 2	145	3.04E+01	Yes	NA	No
AOC 13	MW-8S	1-METHYLNAPHTHALENE	90-12-0	1 : 1	750	6.20E-01	Yes	330	Yes
AOC 13	MW-8S	2,4-Dimethylphenol	105-67-9	2 : 2	3000	7.30E+01	Yes	NA	No
AOC 13	MW-8S	2-Methylnaphthalene	91-57-6	2 : 2	760	6.20E-01	Yes	330	Yes
AOC 13	MW-8S	Acenaphthene	83-32-9	2 : 2	977	3.65E+01	Yes	NA	No
AOC 13	MW-8S	Acenaphthylene	208-96-8	2 : 2	181	3.65E+01	Yes	NA	No
AOC 13	MW-8S	Acetophenone	98-86-2	1 : 2	50	6.10E+01	No	80000	No
AOC 13	MW-8S	Anthracene	120-12-7	2 : 2	763	1.83E+02	Yes	NA	No
AOC 13	MW-8S	Benzo(a)anthracene	56-55-3	2 : 2	498	9.21E-02	Yes	NA	No
AOC 13	MW-8S	Benzo(a)pyrene	50-32-8	2 : 2	306	9.21E-03	Yes	NA	No
AOC 13	MW-8S	Benzo(b)fluoranthene	205-99-2	2 : 2	253	9.21E-02	Yes	NA	No
AOC 13	MW-8S	Benzo(g,h,i)perylene	191-24-2	2 : 2	120	1.83E+01	Yes	NA	No
AOC 13	MW-8S	Benzo(k)fluoranthene	207-08-9	2 : 2	189	9.21E-01	Yes	NA	No
AOC 13	MW-8S	Carbazole	86-74-8	2 : 2	300	3.36E+00	Yes	NA	No
AOC 13	MW-8S	Chrysene	218-01-9	2 : 2	456	9.21E+00	Yes	NA	No
AOC 13	MW-8S	Dibenz(a,h)anthracene	53-70-3	2 : 2	49.3	9.21E-03	Yes	NA	No
AOC 13	MW-8S	Dibenzofuran	132-64-9	2 : 2	471	1.22E+00	Yes	NA	No
AOC 13	MW-8S	Fluoranthene	206-44-0	2 : 2	1760	1.46E+02	Yes	NA	No
AOC 13	MW-8S	Fluorene	86-73-7	2 : 2	1190	2.43E+01	Yes	NA	No
AOC 13	MW-8S	Indeno(1,2,3-cd)pyrene	193-39-5	2 : 2	118	9.21E-02	Yes	NA	No
AOC 13	MW-8S	Naphthalene	91-20-3	2 : 2	13000	6.20E-01	Yes	15	Yes
AOC 13	MW-8S	o-Cresol (2-Methylphenol)	95-48-7	2 : 2	470	1.82E+02	Yes	NA	No
AOC 13	MW-8S	p-Cresol (4-Methylphenol)	106-44-5	2 : 2	120	1.82E+01	Yes	NA	No
AOC 13	MW-8S	Phenanthrene	85-01-8	2 : 2	3300	1.80E+02	Yes	NA	No
AOC 13	MW-8S	Phenol	108-95-2	1 : 2	45	1.09E+03	No	NA	No
AOC 13	MW-8S	Pyrene	129-00-0	2 : 2	1280	1.83E+01	Yes	NA	No
AOC 13	MW-8S	Acetone	67-64-1	1 : 2	21	5.48E+02	No	22000	No
AOC 13	MW-8S	Benzene	71-43-2	2 : 2	2800	3.54E-01	Yes	5	Yes
AOC 13	MW-8S	Ethylbenzene	100-41-4	2 : 2	630	1.34E+02	Yes	700	No
AOC 13	MW-8S	Isopropylbenzene	98-82-8	2 : 2	22	6.58E+01	No	0.84	Yes
AOC 13	MW-8S	Toluene	108-88-3	2 : 2	890	7.23E+01	Yes	150	Yes
AOC 13	MW-8S	TOTAL XYLENES	TOTAL XYLENES	2 : 2	1720	2.06E+01	Yes	2200	No
AOC 13	MW-9M	Aluminum	7429-90-5	1 : 1	149	3.65E+03	No	NA	No
AOC 13	MW-9M	Barium	7440-39-3	1 : 1	99.1	2.55E+02	No	NA	No
AOC 13	MW-9M	Calcium	7440-70-2	1 : 1	75600	NA	No	NA	No
AOC 13	MW-9M	Chromium (total)	7440-47-3	1 : 1	0.8	1.10E+01	No	NA	No
AOC 13	MW-9M	CYANIDE	57-12-5	1 : 2	44.3	7.30E+01	No	NA	No
AOC 13	MW-9M	Iron	7439-89-6	1 : 1	2460	1.09E+03	Yes	NA	No
AOC 13	MW-9M	Magnesium	7439-95-4	1 : 1	42400	NA	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 13	MW-9M	Manganese	7439-96-5	1 : 1	35	8.76E+01	No	NA	No
AOC 13	MW-9M	Potassium	7440-09-7	1 : 1	6460	NA	No	NA	No
AOC 13	MW-9M	Sodium	7440-23-5	1 : 1	53000	NA	No	NA	No
AOC 13	MW-9M	1-METHYLNAPHTHALENE	90-12-0	1 : 1	0.0503	6.20E-01	No	330	No
AOC 13	MW-9M	Naphthalene	91-20-3	2 : 2	0.449	6.20E-01	No	15	No
AOC 13	MW-9M	Phenanthrene	85-01-8	1 : 2	0.0902	1.80E+02	No	NA	No
AOC 13	MW-9M	Acetone	67-64-1	1 : 2	30	5.48E+02	No	22000	No
AOC 13	MW-9M	Benzene	71-43-2	1 : 2	6.7	3.54E-01	Yes	5	Yes
AOC 13	MW-9M	Ethylbenzene	100-41-4	1 : 2	0.38	1.34E+02	No	700	No
AOC 13	MW-9M	Toluene	108-88-3	2 : 2	0.47	7.23E+01	No	150	No
AOC 13	MW-9M	TOTAL XYLENES	TOTAL XYLENES	1 : 2	0.37	2.06E+01	No	2200	No
AOC 13	MW-9S	Aluminum	7429-90-5	1 : 1	3140	3.65E+03	No	NA	No
AOC 13	MW-9S	Arsenic	7440-38-2	1 : 1	6.7	4.48E-02	Yes	NA	No
AOC 13	MW-9S	Barium	7440-39-3	1 : 1	91.9	2.55E+02	No	NA	No
AOC 13	MW-9S	Calcium	7440-70-2	1 : 1	242000	NA	No	NA	No
AOC 13	MW-9S	CYANIDE	57-12-5	2 : 2	22600	7.30E+01	Yes	NA	No
AOC 13	MW-9S	Iron	7439-89-6	1 : 1	11600	1.09E+03	Yes	NA	No
AOC 13	MW-9S	Magnesium	7439-95-4	1 : 1	21700	NA	No	NA	No
AOC 13	MW-9S	Manganese	7439-96-5	1 : 1	241	8.76E+01	Yes	NA	No
AOC 13	MW-9S	Mercury	7439-97-6	1 : 1	0.04	1.10E+00	No	NA	No
AOC 13	MW-9S	Potassium	7440-09-7	1 : 1	10600	NA	No	NA	No
AOC 13	MW-9S	Selenium	7782-49-2	1 : 1	15.7	1.82E+01	No	NA	No
AOC 13	MW-9S	Sodium	7440-23-5	1 : 1	10000	NA	No	NA	No
AOC 13	MW-9S	1-METHYLNAPHTHALENE	90-12-0	1 : 1	19.35	6.20E-01	Yes	330	No
AOC 13	MW-9S	2-Methylnaphthalene	91-57-6	2 : 2	40	6.20E-01	Yes	330	No
AOC 13	MW-9S	Acenaphthene	83-32-9	2 : 2	19.7	3.65E+01	No	NA	No
AOC 13	MW-9S	Acenaphthylene	208-96-8	2 : 2	9.4	3.65E+01	No	NA	No
AOC 13	MW-9S	Anthracene	120-12-7	1 : 2	2.56	1.83E+02	No	NA	No
AOC 13	MW-9S	Benzo(a)anthracene	56-55-3	1 : 2	0.6295	9.21E-02	Yes	NA	No
AOC 13	MW-9S	Benzo(a)pyrene	50-32-8	1 : 2	0.41	9.21E-03	Yes	NA	No
AOC 13	MW-9S	Benzo(b)fluoranthene	205-99-2	1 : 2	0.305	9.21E-02	Yes	NA	No
AOC 13	MW-9S	Benzo(k)fluoranthene	207-08-9	1 : 2	0.273	9.21E-01	No	NA	No
AOC 13	MW-9S	Chrysene	218-01-9	1 : 2	0.673	9.21E+00	No	NA	No
AOC 13	MW-9S	Fluoranthene	206-44-0	1 : 2	3.63	1.46E+02	No	NA	No
AOC 13	MW-9S	Fluorene	86-73-7	2 : 2	2.3	2.43E+01	No	NA	No
AOC 13	MW-9S	Naphthalene	91-20-3	2 : 2	2800	6.20E-01	Yes	15	Yes
AOC 13	MW-9S	o-Cresol (2-Methylphenol)	95-48-7	1 : 2	27	1.82E+02	No	NA	No
AOC 13	MW-9S	p-Cresol (4-Methylphenol)	106-44-5	1 : 2	26	1.82E+01	Yes	NA	No
AOC 13	MW-9S	Phenanthrene	85-01-8	1 : 2	13.2	1.80E+02	No	NA	No
AOC 13	MW-9S	Phenol	108-95-2	1 : 2	38	1.09E+03	No	NA	No
AOC 13	MW-9S	Pyrene	129-00-0	1 : 2	1.745	1.83E+01	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
AOC 13	MW-9S	Benzene	71-43-2	2 : 2	11000	3.54E-01	Yes	5	Yes
AOC 13	MW-9S	Chlorobenzene	108-90-7	1 : 2	0.299	1.06E+01	No	39	No
AOC 13	MW-9S	Cyclohexane	110-82-7	1 : 2	2.03	1.03E+03	No	71	No
AOC 13	MW-9S	Ethylbenzene	100-41-4	2 : 2	470	1.34E+02	Yes	700	No
AOC 13	MW-9S	Isopropylbenzene	98-82-8	2 : 2	94	6.58E+01	Yes	0.84	Yes
AOC 13	MW-9S	Methylcyclohexane	108-87-2	1 : 2	1.73	5.22E+02	No	71	No
AOC 13	MW-9S	Styrene	100-42-5	2 : 2	280	1.00E+02	Yes	890	No
AOC 13	MW-9S	Toluene	108-88-3	2 : 2	21000	7.23E+01	Yes	150	Yes
AOC 13	MW-9S	TOTAL XYLENES	TOTAL XYLENES	2 : 2	7700	2.06E+01	Yes	2200	Yes
AOC 18 and AOC 21	MW-15S	Aluminum	7429-90-5	1 : 1	1160	3.65E+03	No	NA	No
AOC 18 and AOC 21	MW-15S	Barium	7440-39-3	1 : 1	72.1	2.55E+02	No	NA	No
AOC 18 and AOC 21	MW-15S	Calcium	7440-70-2	1 : 1	91200	NA	No	NA	No
AOC 18 and AOC 21	MW-15S	CYANIDE	57-12-5	1 : 2	33.3	7.30E+01	No	NA	No
AOC 18 and AOC 21	MW-15S	Iron	7439-89-6	1 : 1	1110	1.09E+03	Yes	NA	No
AOC 18 and AOC 21	MW-15S	Magnesium	7439-95-4	1 : 1	29600	NA	No	NA	No
AOC 18 and AOC 21	MW-15S	Manganese	7439-96-5	1 : 1	81.2	8.76E+01	No	NA	No
AOC 18 and AOC 21	MW-15S	Potassium	7440-09-7	1 : 1	3150	NA	No	NA	No
AOC 18 and AOC 21	MW-15S	Sodium	7440-23-5	1 : 1	15800	NA	No	NA	No
AOC 18 and AOC 21	MW-15S	Anthracene	120-12-7	1 : 2	0.05	1.83E+02	No	NA	No
AOC 18 and AOC 21	MW-15S	Phenanthrene	85-01-8	1 : 2	0.061	1.80E+02	No	NA	No
AOC 18 and AOC 21	MW-15S	Toluene	108-88-3	1 : 2	0.44	7.23E+01	No	150	No
Block A	MW-13M	Aluminum	7429-90-5	1 : 1	46.2	3.65E+03	No	NA	No
Block A	MW-13M	Barium	7440-39-3	1 : 1	63.2	2.55E+02	No	NA	No
Block A	MW-13M	Calcium	7440-70-2	1 : 1	302000	NA	No	NA	No
Block A	MW-13M	Chromium (total)	7440-47-3	1 : 1	2.6	1.10E+01	No	NA	No
Block A	MW-13M	CYANIDE	57-12-5	2 : 2	151	7.30E+01	Yes	NA	No
Block A	MW-13M	Iron	7439-89-6	1 : 1	142	1.09E+03	No	NA	No
Block A	MW-13M	Magnesium	7439-95-4	1 : 1	21300	NA	No	NA	No
Block A	MW-13M	Manganese	7439-96-5	1 : 1	16.9	8.76E+01	No	NA	No
Block A	MW-13M	Potassium	7440-09-7	1 : 1	59400	NA	No	NA	No
Block A	MW-13M	Selenium	7782-49-2	1 : 1	20.8	1.82E+01	Yes	NA	No
Block A	MW-13M	Sodium	7440-23-5	1 : 1	13700	NA	No	NA	No
Block A	MW-13M	Naphthalene	91-20-3	1 : 2	0.12	6.20E-01	No	15	No
Block A	MW-13M	Methylcyclohexane	108-87-2	1 : 2	0.947	5.22E+02	No	71	No
Block A	MW-13M	Toluene	108-88-3	1 : 2	0.283	7.23E+01	No	150	No
Block A	MW-13S	Aluminum	7429-90-5	1 : 1	83.8	3.65E+03	No	NA	No
Block A	MW-13S	Barium	7440-39-3	1 : 1	51.3	2.55E+02	No	NA	No
Block A	MW-13S	Calcium	7440-70-2	1 : 1	295000	NA	No	NA	No
Block A	MW-13S	Chromium (total)	7440-47-3	1 : 1	0.72	1.10E+01	No	NA	No
Block A	MW-13S	Iron	7439-89-6	1 : 1	74.9	1.09E+03	No	NA	No
Block A	MW-13S	Magnesium	7439-95-4	1 : 1	105000	NA	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
Block A	MW-13S	Manganese	7439-96-5	1 : 1	456	8.76E+01	Yes	NA	No
Block A	MW-13S	Potassium	7440-09-7	1 : 1	21100	NA	No	NA	No
Block A	MW-13S	Selenium	7782-49-2	1 : 1	4.9	1.82E+01	No	NA	No
Block A	MW-13S	Sodium	7440-23-5	1 : 1	52600	NA	No	NA	No
Block A	MW-13S	Zinc	7440-66-6	1 : 1	7.4	1.09E+03	No	NA	No
Block A	MW-13S	Anthracene	120-12-7	1 : 2	0.078	1.83E+02	No	NA	No
Block A	MW-13S	Caprolactam	105-60-2	1 : 2	75	1.82E+03	No	NA	No
Block A	MW-13S	Phenanthrene	85-01-8	1 : 2	0.098	1.80E+02	No	NA	No
Block A	MW-13S	Acetone	67-64-1	1 : 1	2.3	5.48E+02	No	22000	No
Block A	MW-18S	Calcium	7440-70-2	1 : 1	149000	NA	No	NA	No
Block A	MW-18S	CYANIDE	57-12-5	1 : 2	6.665	7.30E+01	No	NA	No
Block A	MW-18S	Iron	7439-89-6	1 : 1	132	1.09E+03	No	NA	No
Block A	MW-18S	Magnesium	7439-95-4	1 : 1	40200	NA	No	NA	No
Block A	MW-18S	Potassium	7440-09-7	1 : 1	15000	NA	No	NA	No
Block A	MW-18S	Selenium	7782-49-2	1 : 1	7.4	1.82E+01	No	NA	No
Block A	MW-18S	Sodium	7440-23-5	1 : 1	23100	NA	No	NA	No
Block A	MW-18S	Naphthalene	91-20-3	1 : 2	0.88	6.20E-01	Yes	15	No
Block A	MW-18S	Phenanthrene	85-01-8	1 : 2	0.059	1.80E+02	No	NA	No
Block A	MW-18S	Pyrene	129-00-0	1 : 2	0.059	1.83E+01	No	NA	No
Block A	MW-18S	Toluene	108-88-3	1 : 2	0.32	7.23E+01	No	150	No
Southern Parcel	MW-19S	Arsenic	7440-38-2	1 : 1	6.5	4.48E-02	Yes	NA	No
Southern Parcel	MW-19S	Barium	7440-39-3	1 : 1	50.2	2.55E+02	No	NA	No
Southern Parcel	MW-19S	Calcium	7440-70-2	1 : 1	173000	NA	No	NA	No
Southern Parcel	MW-19S	CYANIDE	57-12-5	2 : 2	38	7.30E+01	No	NA	No
Southern Parcel	MW-19S	Magnesium	7439-95-4	1 : 1	64300	NA	No	NA	No
Southern Parcel	MW-19S	Manganese	7439-96-5	1 : 1	150	8.76E+01	Yes	NA	No
Southern Parcel	MW-19S	Potassium	7440-09-7	1 : 1	27600	NA	No	NA	No
Southern Parcel	MW-19S	Selenium	7782-49-2	1 : 1	11.9	1.82E+01	No	NA	No
Southern Parcel	MW-19S	Sodium	7440-23-5	1 : 1	33100	NA	No	NA	No
Southern Parcel	MW-19S	Fluoranthene	206-44-0	1 : 2	0.0945	1.46E+02	No	NA	No
Southern Parcel	MW-19S	Naphthalene	91-20-3	1 : 2	0.19	6.20E-01	No	15	No
Southern Parcel	MW-19S	Phenanthrene	85-01-8	1 : 2	0.0575	1.80E+02	No	NA	No
Southern Parcel	MW-19S	Pyrene	129-00-0	1 : 2	0.0576	1.83E+01	No	NA	No
Southern Parcel	MW-1D	Aluminum	7429-90-5	1 : 2	185	3.65E+03	No	NA	No
Southern Parcel	MW-1D	Barium	7440-39-3	2 : 2	78.7	2.55E+02	No	NA	No
Southern Parcel	MW-1D	Cadmium	7440-43-9	1 : 2	0.55	1.82E+00	No	NA	No
Southern Parcel	MW-1D	Calcium	7440-70-2	2 : 2	121000	NA	No	NA	No
Southern Parcel	MW-1D	Chromium (total)	7440-47-3	1 : 2	3.07	1.10E+01	No	NA	No
Southern Parcel	MW-1D	Iron	7439-89-6	2 : 2	1310	1.09E+03	Yes	NA	No
Southern Parcel	MW-1D	Magnesium	7439-95-4	2 : 2	41200	NA	No	NA	No
Southern Parcel	MW-1D	Manganese	7439-96-5	2 : 2	292	8.76E+01	Yes	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
Southern Parcel	MW-1D	Potassium	7440-09-7	2 : 2	13500	NA	No	NA	No
Southern Parcel	MW-1D	Sodium	7440-23-5	2 : 2	38200	NA	No	NA	No
Southern Parcel	MW-1D	Thallium	7440-28-0	1 : 2	0.0658	2.41E-01	No	NA	No
Southern Parcel	MW-1D	Acetone	67-64-1	1 : 2	8.5	5.48E+02	No	22000	No
Southern Parcel	MW-1S	Aluminum	7429-90-5	1 : 1	40.7	3.65E+03	No	NA	No
Southern Parcel	MW-1S	Arsenic	7440-38-2	1 : 1	5.7	4.48E-02	Yes	NA	No
Southern Parcel	MW-1S	Barium	7440-39-3	1 : 1	61.7	2.55E+02	No	NA	No
Southern Parcel	MW-1S	Calcium	7440-70-2	1 : 1	234000	NA	No	NA	No
Southern Parcel	MW-1S	CYANIDE	57-12-5	2 : 2	93.4	7.30E+01	Yes	NA	No
Southern Parcel	MW-1S	Iron	7439-89-6	1 : 1	80.7	1.09E+03	No	NA	No
Southern Parcel	MW-1S	Magnesium	7439-95-4	1 : 1	78500	NA	No	NA	No
Southern Parcel	MW-1S	Manganese	7439-96-5	1 : 1	1730	8.76E+01	Yes	NA	No
Southern Parcel	MW-1S	Potassium	7440-09-7	1 : 1	17100	NA	No	NA	No
Southern Parcel	MW-1S	Selenium	7782-49-2	1 : 1	10.5	1.82E+01	No	NA	No
Southern Parcel	MW-1S	Sodium	7440-23-5	1 : 1	28400	NA	No	NA	No
Southern Parcel	MW-1S	2-Methylnaphthalene	91-57-6	1 : 2	7.3	6.20E-01	Yes	330	No
Southern Parcel	MW-1S	Acenaphthene	83-32-9	1 : 2	0.69	3.65E+01	No	NA	No
Southern Parcel	MW-1S	Acenaphthylene	208-96-8	1 : 2	5.7	3.65E+01	No	NA	No
Southern Parcel	MW-1S	Anthracene	120-12-7	2 : 2	2.5	1.83E+02	No	NA	No
Southern Parcel	MW-1S	Benzo(a)anthracene	56-55-3	2 : 2	0.12	9.21E-02	Yes	NA	No
Southern Parcel	MW-1S	Benzo(a)pyrene	50-32-8	2 : 2	0.17	9.21E-03	Yes	NA	No
Southern Parcel	MW-1S	Benzo(b)fluoranthene	205-99-2	1 : 2	0.066	9.21E-02	No	NA	No
Southern Parcel	MW-1S	Benzo(k)fluoranthene	207-08-9	1 : 2	0.0902	9.21E-01	No	NA	No
Southern Parcel	MW-1S	Caprolactam	105-60-2	1 : 2	18	1.82E+03	No	NA	No
Southern Parcel	MW-1S	Carbazole	86-74-8	1 : 2	7	3.36E+00	Yes	NA	No
Southern Parcel	MW-1S	Chrysene	218-01-9	2 : 2	0.11	9.21E+00	No	NA	No
Southern Parcel	MW-1S	Dibenzofuran	132-64-9	1 : 2	5.8	1.22E+00	Yes	NA	No
Southern Parcel	MW-1S	Fluoranthene	206-44-0	2 : 2	2.6	1.46E+02	No	NA	No
Southern Parcel	MW-1S	Fluorene	86-73-7	1 : 2	7.8	2.43E+01	No	NA	No
Southern Parcel	MW-1S	Naphthalene	91-20-3	1 : 2	120	6.20E-01	Yes	15	Yes
Southern Parcel	MW-1S	Phenanthrene	85-01-8	2 : 2	11	1.80E+02	No	NA	No
Southern Parcel	MW-1S	Pyrene	129-00-0	2 : 2	1.5	1.83E+01	No	NA	No
Southern Parcel	MW-1S	Benzene	71-43-2	1 : 2	0.93	3.54E-01	Yes	5	No
Southern Parcel	MW-1S	TOTAL XYLENES	TOTAL XYLENES	1 : 2	4.1	2.06E+01	No	2200	No
Southern Parcel	MW-22S	Aluminum	7429-90-5	1 : 1	163	3.65E+03	No	NA	No
Southern Parcel	MW-22S	Barium	7440-39-3	1 : 1	62.6	2.55E+02	No	NA	No
Southern Parcel	MW-22S	Calcium	7440-70-2	1 : 1	294000	NA	No	NA	No
Southern Parcel	MW-22S	CYANIDE	57-12-5	2 : 2	69.9	7.30E+01	No	NA	No
Southern Parcel	MW-22S	Iron	7439-89-6	1 : 1	257	1.09E+03	No	NA	No
Southern Parcel	MW-22S	Magnesium	7439-95-4	1 : 1	94900	NA	No	NA	No
Southern Parcel	MW-22S	Manganese	7439-96-5	1 : 1	90.8	8.76E+01	Yes	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
Southern Parcel	MW-22S	Potassium	7440-09-7	1 : 1	37800	NA	No	NA	No
Southern Parcel	MW-22S	Selenium	7782-49-2	1 : 1	10.9	1.82E+01	No	NA	No
Southern Parcel	MW-22S	Sodium	7440-23-5	1 : 1	38100	NA	No	NA	No
Southern Parcel	MW-22S	Vanadium	7440-62-2	1 : 1	10.7	3.65E+00	Yes	NA	No
Southern Parcel	MW-22S	Zinc	7440-66-6	1 : 1	7.9	1.09E+03	No	NA	No
Southern Parcel	MW-22S	Acetone	67-64-1	1 : 2	3.1	5.48E+02	No	22000	No
Southern Parcel	MW-23S	CYANIDE	57-12-5	1 : 1	17.3	7.30E+01	No	NA	No
Southern Parcel	MW-23S	Benzo(a)pyrene	50-32-8	1 : 1	0.106	9.21E-03	Yes	NA	No
Southern Parcel	MW-23S	Pyrene	129-00-0	1 : 1	0.146	1.83E+01	No	NA	No
Southern Parcel	MW-24S	CYANIDE	57-12-5	1 : 1	15.4	7.30E+01	No	NA	No
Southern Parcel	MW-26S	1-METHYLNAPHTHALENE	90-12-0	1 : 1	0.709	6.20E-01	Yes	330	No
Southern Parcel	MW-26S	Acenaphthene	83-32-9	1 : 1	33.6	3.65E+01	No	NA	No
Southern Parcel	MW-26S	Acenaphthylene	208-96-8	1 : 1	0.177	3.65E+01	No	NA	No
Southern Parcel	MW-26S	Anthracene	120-12-7	1 : 1	1.04	1.83E+02	No	NA	No
Southern Parcel	MW-26S	Carbazole	86-74-8	1 : 1	12.2	3.36E+00	Yes	NA	No
Southern Parcel	MW-26S	Dibenzofuran	132-64-9	1 : 1	6.41	1.22E+00	Yes	NA	No
Southern Parcel	MW-26S	Fluoranthene	206-44-0	1 : 1	0.137	1.46E+02	No	NA	No
Southern Parcel	MW-26S	Fluorene	86-73-7	1 : 1	21.5	2.43E+01	No	NA	No
Southern Parcel	MW-26S	Pyrene	129-00-0	1 : 1	0.183	1.83E+01	No	NA	No
Southern Parcel	MW-26S	Benzene	71-43-2	1 : 1	0.512	3.54E-01	Yes	5	No
Southern Parcel	MW-26S	Isopropylbenzene	98-82-8	1 : 1	2.87	6.58E+01	No	0.84	Yes
Southern Parcel	MW-2D	Aluminum	7429-90-5	1 : 1	161	3.65E+03	No	NA	No
Southern Parcel	MW-2D	Barium	7440-39-3	1 : 1	84.1	2.55E+02	No	NA	No
Southern Parcel	MW-2D	Calcium	7440-70-2	1 : 1	130000	NA	No	NA	No
Southern Parcel	MW-2D	Iron	7439-89-6	1 : 1	283	1.09E+03	No	NA	No
Southern Parcel	MW-2D	Magnesium	7439-95-4	1 : 1	45100	NA	No	NA	No
Southern Parcel	MW-2D	Manganese	7439-96-5	1 : 1	299	8.76E+01	Yes	NA	No
Southern Parcel	MW-2D	Potassium	7440-09-7	1 : 1	10800	NA	No	NA	No
Southern Parcel	MW-2D	Sodium	7440-23-5	1 : 1	21900	NA	No	NA	No
Southern Parcel	MW-2D	Zinc	7440-66-6	1 : 1	6.7	1.09E+03	No	NA	No
Southern Parcel	MW-2D	Phenol	108-95-2	1 : 2	5.1	1.09E+03	No	NA	No
Southern Parcel	MW-2D	Acetone	67-64-1	1 : 1	2.8	5.48E+02	No	22000	No
Southern Parcel	MW-2S	Antimony	7440-36-0	1 : 2	0.479	1.46E+00	No	NA	No
Southern Parcel	MW-2S	Arsenic	7440-38-2	1 : 2	0.92	4.48E-02	Yes	NA	No
Southern Parcel	MW-2S	Barium	7440-39-3	1 : 2	64	2.55E+02	No	NA	No
Southern Parcel	MW-2S	Calcium	7440-70-2	2 : 2	211000	NA	No	NA	No
Southern Parcel	MW-2S	Cobalt	7440-48-4	1 : 2	0.44	7.30E+01	No	NA	No
Southern Parcel	MW-2S	CYANIDE	57-12-5	2 : 2	17.4	7.30E+01	No	NA	No
Southern Parcel	MW-2S	Iron	7439-89-6	1 : 2	217	1.09E+03	No	NA	No
Southern Parcel	MW-2S	Magnesium	7439-95-4	2 : 2	72200	NA	No	NA	No
Southern Parcel	MW-2S	Manganese	7439-96-5	2 : 2	27.5	8.76E+01	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
Southern Parcel	MW-2S	Nickel	7440-02-0	1 : 2	8	7.30E+01	No	NA	No
Southern Parcel	MW-2S	Potassium	7440-09-7	2 : 2	23900	NA	No	NA	No
Southern Parcel	MW-2S	Selenium	7782-49-2	2 : 2	21.2	1.82E+01	Yes	NA	No
Southern Parcel	MW-2S	Sodium	7440-23-5	2 : 2	13900	NA	No	NA	No
Southern Parcel	MW-2S	Thallium	7440-28-0	1 : 2	1.67	2.41E-01	Yes	NA	No
Southern Parcel	MW-2S	Zinc	7440-66-6	2 : 2	466	1.09E+03	No	NA	No
Southern Parcel	MW-2S	Caprolactam	105-60-2	1 : 2	7.2	1.82E+03	No	NA	No
Southern Parcel	MW-30S	1-METHYLNAPHTHALENE	90-12-0	1 : 1	114	6.20E-01	Yes	330	No
Southern Parcel	MW-30S	2-Methylnaphthalene	91-57-6	1 : 1	5.29	6.20E-01	Yes	330	No
Southern Parcel	MW-30S	Acenaphthene	83-32-9	1 : 1	16.3	3.65E+01	No	NA	No
Southern Parcel	MW-30S	Anthracene	120-12-7	1 : 1	0.469	1.83E+02	No	NA	No
Southern Parcel	MW-30S	Fluorene	86-73-7	1 : 1	13.2	2.43E+01	No	NA	No
Southern Parcel	MW-30S	Phenanthrene	85-01-8	1 : 1	9.77	1.80E+02	No	NA	No
Southern Parcel	MW-30S	Pyrene	129-00-0	1 : 1	0.102	1.83E+01	No	NA	No
Southern Parcel	MW-30S	Benzene	71-43-2	1 : 1	0.343	3.54E-01	No	5	No
Southern Parcel	MW-30S	Isopropylbenzene	98-82-8	1 : 1	4.39	6.58E+01	No	0.84	Yes
Southern Parcel	MW-32S	CYANIDE	57-12-5	1 : 1	76.9	7.30E+01	Yes	NA	No
Southern Parcel	MW-32S	Naphthalene	91-20-3	1 : 1	0.0849	6.20E-01	No	15	No
Southern Parcel	MW-3D	Aluminum	7429-90-5	1 : 2	211	3.65E+03	No	NA	No
Southern Parcel	MW-3D	Arsenic	7440-38-2	1 : 2	0.302	4.48E-02	Yes	NA	No
Southern Parcel	MW-3D	Barium	7440-39-3	2 : 2	81.7	2.55E+02	No	NA	No
Southern Parcel	MW-3D	Calcium	7440-70-2	2 : 2	109000	NA	No	NA	No
Southern Parcel	MW-3D	Cobalt	7440-48-4	1 : 2	1.48	7.30E+01	No	NA	No
Southern Parcel	MW-3D	Iron	7439-89-6	2 : 2	218	1.09E+03	No	NA	No
Southern Parcel	MW-3D	Magnesium	7439-95-4	2 : 2	39000	NA	No	NA	No
Southern Parcel	MW-3D	Manganese	7439-96-5	2 : 2	150	8.76E+01	Yes	NA	No
Southern Parcel	MW-3D	Nickel	7440-02-0	1 : 2	6.23	7.30E+01	No	NA	No
Southern Parcel	MW-3D	Potassium	7440-09-7	2 : 2	8190	NA	No	NA	No
Southern Parcel	MW-3D	Selenium	7782-49-2	1 : 2	1.14	1.82E+01	No	NA	No
Southern Parcel	MW-3D	Sodium	7440-23-5	2 : 2	27100	NA	No	NA	No
Southern Parcel	MW-3D	Zinc	7440-66-6	2 : 2	10.7	1.09E+03	No	NA	No
Southern Parcel	MW-3D	Acetone	67-64-1	1 : 2	2.9	5.48E+02	No	22000	No
Southern Parcel	MW-3S	Aluminum	7429-90-5	2 : 2	403	3.65E+03	No	NA	No
Southern Parcel	MW-3S	Antimony	7440-36-0	1 : 2	1.55	1.46E+00	Yes	NA	No
Southern Parcel	MW-3S	Arsenic	7440-38-2	2 : 2	5.2	4.48E-02	Yes	NA	No
Southern Parcel	MW-3S	Barium	7440-39-3	1 : 2	45.9	2.55E+02	No	NA	No
Southern Parcel	MW-3S	Calcium	7440-70-2	2 : 2	268000	NA	No	NA	No
Southern Parcel	MW-3S	Cobalt	7440-48-4	1 : 2	0.986	7.30E+01	No	NA	No
Southern Parcel	MW-3S	CYANIDE	57-12-5	2 : 2	108	7.30E+01	Yes	NA	No
Southern Parcel	MW-3S	Iron	7439-89-6	2 : 2	3270	1.09E+03	Yes	NA	No
Southern Parcel	MW-3S	Lead	7439-92-1	1 : 2	0.54	1.50E+01	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
Southern Parcel	MW-3S	Magnesium	7439-95-4	2 : 2	114000	NA	No	NA	No
Southern Parcel	MW-3S	Manganese	7439-96-5	2 : 2	888	8.76E+01	Yes	NA	No
Southern Parcel	MW-3S	Nickel	7440-02-0	1 : 2	9.32	7.30E+01	No	NA	No
Southern Parcel	MW-3S	Potassium	7440-09-7	2 : 2	26400	NA	No	NA	No
Southern Parcel	MW-3S	Selenium	7782-49-2	1 : 2	8.66	1.82E+01	No	NA	No
Southern Parcel	MW-3S	Sodium	7440-23-5	2 : 2	31500	NA	No	NA	No
Southern Parcel	MW-3S	Thallium	7440-28-0	1 : 2	4.94	2.41E-01	Yes	NA	No
Southern Parcel	MW-3S	Zinc	7440-66-6	1 : 2	61.1	1.09E+03	No	NA	No
Southern Parcel	MW-3S	Acenaphthylene	208-96-8	1 : 2	0.069	3.65E+01	No	NA	No
Southern Parcel	MW-3S	Anthracene	120-12-7	1 : 2	0.098	1.83E+02	No	NA	No
Southern Parcel	MW-3S	Caprolactam	105-60-2	1 : 2	59	1.82E+03	No	NA	No
Southern Parcel	MW-3S	Phenanthrene	85-01-8	1 : 2	0.059	1.80E+02	No	NA	No
Southern Parcel	MW-3S	Pyrene	129-00-0	1 : 2	0.059	1.83E+01	No	NA	No
Southern Parcel	MW-4M	Aluminum	7429-90-5	2 : 2	155	3.65E+03	No	NA	No
Southern Parcel	MW-4M	Arsenic	7440-38-2	1 : 2	1.48	4.48E-02	Yes	NA	No
Southern Parcel	MW-4M	Barium	7440-39-3	2 : 2	68.9	2.55E+02	No	NA	No
Southern Parcel	MW-4M	Calcium	7440-70-2	2 : 2	130000	NA	No	NA	No
Southern Parcel	MW-4M	Iron	7439-89-6	2 : 2	4320	1.09E+03	Yes	NA	No
Southern Parcel	MW-4M	Lead	7439-92-1	1 : 2	0.525	1.50E+01	No	NA	No
Southern Parcel	MW-4M	Magnesium	7439-95-4	2 : 2	44800	NA	No	NA	No
Southern Parcel	MW-4M	Manganese	7439-96-5	2 : 2	134	8.76E+01	Yes	NA	No
Southern Parcel	MW-4M	Potassium	7440-09-7	2 : 2	16100	NA	No	NA	No
Southern Parcel	MW-4M	Sodium	7440-23-5	2 : 2	42700	NA	No	NA	No
Southern Parcel	MW-4M	Thallium	7440-28-0	1 : 2	0.065	2.41E-01	No	NA	No
Southern Parcel	MW-4M	Zinc	7440-66-6	1 : 2	3.9	1.09E+03	No	NA	No
Southern Parcel	MW-4M	Anthracene	120-12-7	1 : 2	0.069	1.83E+02	No	NA	No
Southern Parcel	MW-4M	Phenanthrene	85-01-8	1 : 2	0.079	1.80E+02	No	NA	No
Southern Parcel	MW-4S	Aluminum	7429-90-5	1 : 1	7120	3.65E+03	Yes	NA	No
Southern Parcel	MW-4S	Arsenic	7440-38-2	1 : 1	6.8	4.48E-02	Yes	NA	No
Southern Parcel	MW-4S	Barium	7440-39-3	1 : 1	93.55	2.55E+02	No	NA	No
Southern Parcel	MW-4S	Calcium	7440-70-2	1 : 1	193500	NA	No	NA	No
Southern Parcel	MW-4S	Chromium (total)	7440-47-3	1 : 1	16.75	1.10E+01	Yes	NA	No
Southern Parcel	MW-4S	CYANIDE	57-12-5	2 : 2	33.9	7.30E+01	No	NA	No
Southern Parcel	MW-4S	Iron	7439-89-6	1 : 1	7060	1.09E+03	Yes	NA	No
Southern Parcel	MW-4S	Lead	7439-92-1	1 : 1	4	1.50E+01	No	NA	No
Southern Parcel	MW-4S	Magnesium	7439-95-4	1 : 1	69350	NA	No	NA	No
Southern Parcel	MW-4S	Manganese	7439-96-5	1 : 1	361.5	8.76E+01	Yes	NA	No
Southern Parcel	MW-4S	Potassium	7440-09-7	1 : 1	25500	NA	No	NA	No
Southern Parcel	MW-4S	Sodium	7440-23-5	1 : 1	26450	NA	No	NA	No
Southern Parcel	MW-4S	Vanadium	7440-62-2	1 : 1	18.2	3.65E+00	Yes	NA	No
Southern Parcel	MW-4S	Zinc	7440-66-6	1 : 1	27.1	1.09E+03	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
Southern Parcel	MW-4S	Acenaphthene	83-32-9	1 : 2	0.0605	3.65E+01	No	NA	No
Southern Parcel	MW-4S	Acenaphthylene	208-96-8	1 : 2	0.065	3.65E+01	No	NA	No
Southern Parcel	MW-4S	Benzo(a)anthracene	56-55-3	1 : 2	0.0593	9.21E-02	No	NA	No
Southern Parcel	MW-4S	Caprolactam	105-60-2	1 : 2	17.5	1.82E+03	No	NA	No
Southern Parcel	MW-4S	Chrysene	218-01-9	1 : 2	0.0538	9.21E+00	No	NA	No
Southern Parcel	MW-4S	Fluoranthene	206-44-0	2 : 2	0.141	1.46E+02	No	NA	No
Southern Parcel	MW-4S	Naphthalene	91-20-3	1 : 2	1.2	6.20E-01	Yes	15	No
Southern Parcel	MW-4S	Phenanthrene	85-01-8	2 : 2	0.071	1.80E+02	No	NA	No
Southern Parcel	MW-4S	Pyrene	129-00-0	2 : 2	0.103	1.83E+01	No	NA	No
Southern Parcel	MW-5S	Barium	7440-39-3	1 : 1	60.7	2.55E+02	No	NA	No
Southern Parcel	MW-5S	Calcium	7440-70-2	1 : 1	152000	NA	No	NA	No
Southern Parcel	MW-5S	CYANIDE	57-12-5	2 : 2	34.3	7.30E+01	No	NA	No
Southern Parcel	MW-5S	Magnesium	7439-95-4	1 : 1	47300	NA	No	NA	No
Southern Parcel	MW-5S	Manganese	7439-96-5	1 : 1	38.5	8.76E+01	No	NA	No
Southern Parcel	MW-5S	Potassium	7440-09-7	1 : 1	22300	NA	No	NA	No
Southern Parcel	MW-5S	Selenium	7782-49-2	1 : 1	12.2	1.82E+01	No	NA	No
Southern Parcel	MW-5S	Sodium	7440-23-5	1 : 1	21500	NA	No	NA	No
Southern Parcel	MW-5S	Naphthalene	91-20-3	1 : 2	0.2	6.20E-01	No	15	No
Southern Parcel	MW-7M	Aluminum	7429-90-5	1 : 2	83.9	3.65E+03	No	NA	No
Southern Parcel	MW-7M	Arsenic	7440-38-2	1 : 2	3.5	4.48E-02	Yes	NA	No
Southern Parcel	MW-7M	Barium	7440-39-3	2 : 2	89	2.55E+02	No	NA	No
Southern Parcel	MW-7M	Calcium	7440-70-2	2 : 2	110000	NA	No	NA	No
Southern Parcel	MW-7M	CYANIDE	57-12-5	2 : 2	20.8	7.30E+01	No	NA	No
Southern Parcel	MW-7M	Iron	7439-89-6	2 : 2	3350	1.09E+03	Yes	NA	No
Southern Parcel	MW-7M	Magnesium	7439-95-4	2 : 2	40500	NA	No	NA	No
Southern Parcel	MW-7M	Manganese	7439-96-5	2 : 2	161	8.76E+01	Yes	NA	No
Southern Parcel	MW-7M	Potassium	7440-09-7	2 : 2	4490	NA	No	NA	No
Southern Parcel	MW-7M	Selenium	7782-49-2	1 : 2	1.19	1.82E+01	No	NA	No
Southern Parcel	MW-7M	Sodium	7440-23-5	2 : 2	22900	NA	No	NA	No
Southern Parcel	MW-7M	Zinc	7440-66-6	1 : 2	4.8	1.09E+03	No	NA	No
Southern Parcel	MW-7M	Acetone	67-64-1	1 : 1	14	5.48E+02	No	22000	No
Southern Parcel	MW-7S	Aluminum	7429-90-5	1 : 1	98.1	3.65E+03	No	NA	No
Southern Parcel	MW-7S	Barium	7440-39-3	1 : 1	79.8	2.55E+02	No	NA	No
Southern Parcel	MW-7S	Calcium	7440-70-2	1 : 1	121000	NA	No	NA	No
Southern Parcel	MW-7S	CYANIDE	57-12-5	2 : 2	168	7.30E+01	Yes	NA	No
Southern Parcel	MW-7S	Iron	7439-89-6	1 : 1	1080	1.09E+03	No	NA	No
Southern Parcel	MW-7S	Magnesium	7439-95-4	1 : 1	50900	NA	No	NA	No
Southern Parcel	MW-7S	Manganese	7439-96-5	1 : 1	221	8.76E+01	Yes	NA	No
Southern Parcel	MW-7S	Potassium	7440-09-7	1 : 1	9450	NA	No	NA	No
Southern Parcel	MW-7S	Sodium	7440-23-5	1 : 1	43800	NA	No	NA	No
Southern Parcel	MW-7S	Acenaphthene	83-32-9	1 : 2	4.2	3.65E+01	No	NA	No

TABLE B-3a
COPC SCREENING - GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Area	Well	Chemical	CAS	FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Groundwater COPC? (b)	Vapor Intrustion Screening Level (ug/L) (c)	Vapor Intrusion COPC (d)
Southern Parcel	MW-7S	Anthracene	120-12-7	1 : 2	0.16	1.83E+02	No	NA	No
Southern Parcel	MW-7S	Caprolactam	105-60-2	1 : 2	36	1.82E+03	No	NA	No
Southern Parcel	MW-7S	Phenanthrene	85-01-8	1 : 2	0.068	1.80E+02	No	NA	No

Notes:
CAS - Chemical Abstracts Service.
COPC - Chemical of potential
EN - Essential nutrient. Essential nutrients are not included as COPCs (calcium, magnesium, potassium, sodium).
FOD - Frequency of Detection.
NA - Not applicable. Chemical not evaluated for vapor intrusion. See Table B-7.
(a) Groundwater screening levels are the lower of (See Table B-7 for detailed references):
USEPA, 2004b. 2004 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-02-038. Maximum Contaminant Levels (MCL). Winter 2004.
USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for Tap Water. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects.
(b) COPC if maximum detected concentration is greater than screening level.
(c) USEPA Draft Guidance for Evaluating the Vapor Intrusion To Indoor Air Pathway from Groundwater and Soils. November 29, 2002. See Table B-7 for specific references.

TABLE B-3b
COPC SCREENING - OFF-SITE GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	FOD	%FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Off-Site Groundwater COPC? (b)	Reason
1,1-Biphenyl	92-52-4	1 : 22	4.5	35.2	3.04E+01	No	<5%FOD (c)
1-METHYLNAPHTHALENE	90-12-0	3 : 12	25.0	158.5	6.20E-01	Yes	>Screening Level
2-Methylnaphthalene	91-57-6	3 : 22	13.6	342	6.20E-01	Yes	>Screening Level
Acenaphthene	83-32-9	2 : 22	9.1	11.15	3.65E+01	No	</=Screening Level
Acenaphthylene	208-96-8	2 : 22	9.1	50.35	3.65E+01	Yes	>Screening Level
Acetone	67-64-1	8 : 19	42.1	30	5.48E+02	No	</=Screening Level
Aluminum	7429-90-5	12 : 17	70.6	211	3.65E+03	No	</=Screening Level
Anthracene	120-12-7	4 : 22	18.2	8.235	1.83E+02	No	</=Screening Level
Arsenic	7440-38-2	5 : 17	29.4	3.5	4.48E-02	Yes	>Screening Level
Barium	7440-39-3	17 : 17	100.0	299	2.55E+02	Yes	>Screening Level
Benzene	71-43-2	5 : 22	22.7	12.25	3.54E-01	Yes	>Screening Level
Benzo(a)anthracene	56-55-3	1 : 22	4.5	1.545	9.21E-02	No	<5%FOD (c)
Benzo(a)pyrene	50-32-8	2 : 22	9.1	1.0065	9.21E-03	Yes	>Screening Level
Benzo(b)fluoranthene	205-99-2	1 : 22	4.5	3.36	9.21E-02	No	<5%FOD (c)
Benzo(g,h,i)perylene	191-24-2	1 : 22	4.5	0.596	1.83E+01	No	</=Screening Level
Benzo(k)fluoranthene	207-08-9	1 : 22	4.5	0.9815	9.21E-01	No	<5%FOD (c)
Beryllium	7440-41-7	1 : 17	5.9	0.601	4.00E+00	No	</=Screening Level
Bis(2-Ethylhexyl)phthalate	117-81-7	2 : 22	9.1	9.65	4.80E+00	Yes	>Screening Level
Cadmium	7440-43-9	1 : 17	5.9	0.55	1.82E+00	No	</=Screening Level
Calcium	7440-70-2	17 : 17	100.0	302000	EN	No	EN
Carbazole	86-74-8	1 : 22	4.5	3.36	3.36E+00	No	<5%FOD (c)
Chromium (total)	7440-47-3	4 : 17	23.5	3.07	1.10E+01	No	</=Screening Level
Chrysene	218-01-9	1 : 22	4.5	1.3705	9.21E+00	No	</=Screening Level
cis-1,2-Dichloroethene	156-59-2	1 : 22	4.5	0.39	6.08E+00	No	</=Screening Level
Cobalt	7440-48-4	3 : 17	17.6	2.04	7.30E+01	No	</=Screening Level
Copper	7440-50-8	1 : 17	5.9	3.56	1.46E+02	No	</=Screening Level
CYANIDE	57-12-5	12 : 22	54.5	9920	7.30E+01	Yes	>Screening Level
Dibenz(a,h)anthracene	53-70-3	1 : 22	4.5	0.215	9.21E-03	No	<5%FOD (c)
Dibenzofuran	132-64-9	1 : 22	4.5	52.95	1.22E+00	No	<5%FOD (c)
Di-n-butylphthalate	84-74-2	1 : 22	4.5	3.61	3.65E+02	No	</=Screening Level
Ethylbenzene	100-41-4	2 : 22	9.1	0.808	1.34E+02	No	</=Screening Level
Fluoranthene	206-44-0	4 : 22	18.2	7.75	1.46E+02	No	</=Screening Level
Fluorene	86-73-7	3 : 22	13.6	57.5	2.43E+01	Yes	>Screening Level
Indeno(1,2,3-cd)pyrene	193-39-5	1 : 21	4.8	0.529	9.21E-02	No	<5%FOD (c)
Iron	7439-89-6	17 : 17	100.0	4320	1.09E+03	Yes	>Screening Level
Lead	7439-92-1	1 : 17	5.9	0.525	1.50E+01	No	</=Screening Level
Magnesium	7439-95-4	17 : 17	100.0	75600	EN	No	EN
Manganese	7439-96-5	17 : 17	100.0	465	8.76E+01	Yes	>Screening Level
Mercury	7439-97-6	1 : 17	5.9	0.1	1.10E+00	No	</=Screening Level
Methylcyclohexane	108-87-2	1 : 22	4.5	0.947	5.22E+02	No	</=Screening Level
Naphthalene	91-20-3	7 : 22	31.8	983.5	6.20E-01	Yes	>Screening Level

TABLE B-3b
COPC SCREENING - OFF-SITE GROUNDWATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	FOD	%FOD	Maximum Detect (ug/L)	Groundwater Screening Level (ug/L) (a)	Off-Site Groundwater COPC? (b)	Reason
Nickel	7440-02-0	4 : 17	23.5	11.5	7.30E+01	No	</=Screening Level
Phenanthrene	85-01-8	7 : 22	31.8	51.25	1.80E+02	No	</=Screening Level
Phenol	108-95-2	2 : 22	9.1	11.35	1.09E+03	No	</=Screening Level
Potassium	7440-09-7	17 : 17	100.0	59400	EN	No	EN
Pyrene	129-00-0	4 : 22	18.2	4.695	1.83E+01	No	</=Screening Level
Selenium	7782-49-2	5 : 17	29.4	20.8	1.82E+01	Yes	>Screening Level
Sodium	7440-23-5	17 : 17	100.0	53000	EN	No	EN
Styrene	100-42-5	1 : 22	4.5	0.808	1.00E+02	No	</=Screening Level
Thallium	7440-28-0	3 : 17	17.6	0.0798	2.41E-01	No	</=Screening Level
Toluene	108-88-3	4 : 22	18.2	7.455	7.23E+01	No	</=Screening Level
TOTAL XYLENES	TOTAL XYLENES	2 : 22	9.1	12.25	2.06E+01	No	</=Screening Level
Zinc	7440-66-6	7 : 17	41.2	10.7	1.09E+03	No	</=Screening Level

Notes:
CAS - Chemical Abstracts Service.
COPC - Chemical of potential
EN - Essential nutrient. Essential nutrients are not included as COPCs (calcium, magnesium, potassium, sodium).
FOD - Frequency of Detection.
(a) Groundwater screening levels are the lower of (See Table B-7 for detailed references):
USEPA, 2004b. 2004 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-02-038. Maximum Contaminant Levels (MCL). Winter 2004.
USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for Tap Water. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects.
(b) COPC if maximum detected concentration is greater than screening level and passes FOD screen.
(c) Not included as a COPC where FOD is less than 5%, provided 20 samples are available.

TABLE B-4a
COPC SCREENING - AOC 19 AND AOC 7 SEDIMENT
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
AOC 19													
Acetone	67-64-1	mg/kg	1 : 1 : 3	33	9.00E-03	9.00E-03	9.00E-03	GMRSD18	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	3 : 3 : 3	100	3.97E+03	2.50E+03	5.23E+03	GMRSD18	No	7.61E+03	No	No	</=PRG
Anthracene	120-12-7	mg/kg	2 : 3 : 3	67	8.37E-02	2.12E-02	1.40E-01	GMRSD18	No	2.19E+03	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	3 : 3 : 3	100	3.10E+00	2.60E+00	3.50E+00	GMRSD17	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	3 : 3 : 3	100	4.52E+01	2.01E+01	7.07E+01	GMRSD18	No	5.37E+02	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	3 : 3 : 3	100	2.40E-01	3.95E-02	5.20E-01	GMRSD18	No	6.21E-01	No	No	</=PRG
Benzo(a)pyrene	50-32-8	mg/kg	3 : 3 : 3	100	4.01E-01	7.20E-02	8.50E-01	GMRSD18	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	3 : 3 : 3	100	3.63E-01	6.95E-02	7.70E-01	GMRSD18	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	3 : 3 : 3	100	2.25E-01	4.35E-02	4.60E-01	GMRSD18	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	3 : 3 : 3	100	2.62E-01	3.55E-02	5.60E-01	GMRSD18	No	6.21E+00	No	No	</=PRG
Calcium	7440-70-2	mg/kg	3 : 3 : 3	100	1.07E+05	8.67E+04	1.34E+05	GMRSD17	Yes	NA	–	No	NA
Chromium (total)	7440-47-3	mg/kg	3 : 3 : 3	100	8.90E+00	5.70E+00	1.21E+01	GMRSD18	No	2.20E+01	No	No	</=PRG
Chrysene	218-01-9	mg/kg	3 : 3 : 3	100	3.15E-01	5.50E-02	6.60E-01	GMRSD18	No	6.21E+01	No	No	</=PRG
Copper	7440-50-8	mg/kg	3 : 3 : 3	100	1.28E+01	5.35E+00	2.18E+01	GMRSD18	No	3.13E+02	No	No	</=PRG
Dibenz(a,h)anthracen	53-70-3	mg/kg	1 : 1 : 3	33	1.20E-02	1.20E-02	1.20E-02	GMRSD16	No	6.21E-02	No	No	</=PRG
Di-n-butylphthalate	84-74-2	mg/kg	1 : 1 : 3	33	6.30E-02	6.30E-02	6.30E-02	GMRSD16	No	6.11E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	3 : 3 : 3	100	6.46E-01	1.10E-01	1.40E+00	GMRSD18	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	1 : 1 : 3	33	1.90E-02	1.90E-02	1.90E-02	GMRSD16	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	3 : 3 : 3	100	1.96E-01	3.60E-02	4.00E-01	GMRSD18	No	6.21E-01	No	No	</=PRG
Iron	7439-89-6	mg/kg	3 : 3 : 3	100	1.03E+04	7.44E+03	1.27E+04	GMRSD18	No	2.35E+03	Yes	Yes	>PRG
Lead	7439-92-1	mg/kg	3 : 3 : 3	100	9.73E+00	5.00E+00	1.51E+01	GMRSD18	No	4.00E+02	No	No	</=PRG
Magnesium	7439-95-4	mg/kg	3 : 3 : 3	100	3.56E+04	2.59E+04	4.60E+04	GMRSD17	Yes	NA	–	No	NA
Manganese	7439-96-5	mg/kg	3 : 3 : 3	100	3.65E+02	2.79E+02	4.81E+02	GMRSD17	No	1.76E+02	Yes	Yes	>PRG
Methylene chloride	75-09-2	mg/kg	3 : 3 : 3	100	2.76E-03	5.70E-04	5.10E-03	GMRSD17	No	9.11E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	2 : 3 : 3	67	7.16E+00	9.20E+00	9.90E+00	GMRSD18	No	1.56E+02	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	3 : 3 : 3	100	2.68E-01	3.48E-02	5.60E-01	GMRSD18	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	3 : 3 : 3	100	7.14E+02	5.74E+02	9.04E+02	GMRSD18	Yes	NA	–	No	NA
Pyrene	129-00-0	mg/kg	3 : 3 : 3	100	5.15E-01	8.85E-02	1.10E+00	GMRSD18	No	2.32E+02	No	No	</=PRG
Sodium	7440-23-5	mg/kg	3 : 3 : 3	100	1.56E+02	1.39E+02	1.66E+02	GMRSD17	Yes	NA	–	No	NA
Toluene	108-88-3	mg/kg	3 : 3 : 3	100	5.87E-04	4.70E-04	7.20E-04	GMRSD18	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	2 : 3 : 3	67	1.30E-01	1.30E-01	2.40E-01	GMRSD18	No	1.10E-01	Yes	Yes	>PRG
Vanadium	7440-62-2	mg/kg	3 : 3 : 3	100	1.20E+01	1.02E+01	1.55E+01	GMRSD18	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	3 : 3 : 3	100	3.89E+01	1.75E+01	5.93E+01	GMRSD18	No	2.35E+03	No	No	</=PRG

TABLE B-4a
COPC SCREENING - AOC 19 AND AOC 7 SEDIMENT
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
AOC 7													
2-Methylnaphthalene	91-57-6	mg/kg	1 : 3 : 4	25	2.43E-01	3.10E-01	3.10E-01	AOC7SD13	No	5.59E+00	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	4 : 4 : 4	100	1.15E+00	2.10E-02	4.50E+00	AOC7SD13	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	2 : 4 : 4	50	1.36E-02	1.00E-02	2.05E-02	AOC7SD13	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	4 : 4 : 4	100	1.05E+04	6.03E+03	1.75E+04	AOC7SD10	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	4 : 4 : 4	100	3.78E+00	2.50E-02	1.50E+01	AOC7SD13	No	2.19E+03	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	4 : 4 : 4	100	6.82E+00	6.10E+00	7.30E+00	AOC7SD10	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	4 : 4 : 4	100	1.09E+02	6.38E+01	1.94E+02	AOC7SD10	No	5.37E+02	No	No	</=PRG
Benzaldehyde	100-52-7	mg/kg	1 : 1 : 4	25	6.00E-02	6.00E-02	6.00E-02	AOC7SD10	No	6.11E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	2 : 2 : 4	50	7.60E-04	5.20E-04	1.00E-03	AOC7SD13	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	4 : 4 : 4	100	4.36E+00	1.10E-01	1.70E+01	AOC7SD13	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	4 : 4 : 4	100	3.63E+00	1.20E-01	1.40E+01	AOC7SD13	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	4 : 4 : 4	100	3.13E+00	1.30E-01	1.20E+01	AOC7SD13	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	4 : 4 : 4	100	2.34E+00	6.50E-02	9.00E+00	AOC7SD13	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	4 : 4 : 4	100	3.37E+00	1.10E-01	1.30E+01	AOC7SD13	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	1 : 4 : 4	25	5.00E-01	1.05E+00	1.05E+00	AOC7SD10	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phtha	117-81-7	mg/kg	1 : 1 : 4	25	1.70E-01	1.70E-01	1.70E-01	AOC7SD11	No	3.47E+01	No	No	</=PRG
Calcium	7440-70-2	mg/kg	4 : 4 : 4	100	3.06E+04	1.65E+04	5.67E+04	AOC7SD10	Yes	NA	–	No	NA
Carbazole	86-74-8	mg/kg	1 : 4 : 4	25	1.03E+00	3.10E+00	3.10E+00	AOC7SD13	No	2.43E+01	No	No	</=PRG
Carbon disulfide	75-15-0	mg/kg	2 : 2 : 4	50	7.30E-04	7.00E-04	7.60E-04	AOC7SD10	No	3.55E+01	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	4 : 4 : 4	100	1.65E+01	1.40E+01	2.24E+01	AOC7SD10	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	4 : 4 : 4	100	4.40E+00	1.40E-01	1.70E+01	AOC7SD13	No	6.21E+01	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	2 : 4 : 4	50	4.43E+00	5.03E+00	6.20E+00	AOC7SD12	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	4 : 4 : 4	100	1.68E+01	1.29E+01	2.18E+01	AOC7SD10	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	1 : 4 : 4	25	7.83E-01	1.20E+00	1.20E+00	AOC7SD10	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	4 : 4 : 4	100	2.85E-03	1.20E-03	4.65E-03	AOC7SD13	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracen	53-70-3	mg/kg	4 : 4 : 4	100	6.73E-01	1.80E-02	2.60E+00	AOC7SD13	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	1 : 4 : 4	25	6.29E-01	1.50E+00	1.50E+00	AOC7SD13	No	1.45E+01	No	No	</=PRG
Ethylbenzene	100-41-4	mg/kg	2 : 2 : 4	50	5.60E-04	4.60E-04	6.60E-04	AOC7SD13	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	4 : 4 : 4	100	9.78E+00	2.30E-01	3.80E+01	AOC7SD13	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	1 : 4 : 4	25	1.31E+00	5.00E+00	5.00E+00	AOC7SD13	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	4 : 4 : 4	100	2.15E+00	5.40E-02	8.30E+00	AOC7SD13	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	4 : 4 : 4	100	1.63E+04	1.22E+04	1.92E+04	AOC7SD13	No	2.35E+03	Yes	Yes	>PRG
Lead	7439-92-1	mg/kg	4 : 4 : 4	100	2.34E+01	1.62E+01	3.33E+01	AOC7SD10	No	4.00E+02	No	No	</=PRG

TABLE B-4a
COPC SCREENING - AOC 19 AND AOC 7 SEDIMENT
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Magnesium	7439-95-4	mg/kg	4 : 4 : 4	100	1.05E+04	7.04E+03	1.66E+04	AOC7SD10	Yes	NA	--	No	NA
Manganese	7439-96-5	mg/kg	4 : 4 : 4	100	1.14E+03	5.41E+02	2.57E+03	AOC7SD10	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	2 : 4 : 4	50	5.00E-02	4.00E-02	1.15E-01	AOC7SD10	No	2.30E+00	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	4 : 4 : 4	100	2.62E-03	1.30E-03	4.15E-03	AOC7SD13	No	2.59E+02	No	No	</=PRG
Methylene chloride	75-09-2	mg/kg	1 : 1 : 4	25	4.20E-04	4.20E-04	4.20E-04	AOC7SD10	No	9.11E+00	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	3 : 4 : 4	75	1.89E-01	2.40E-02	5.80E-01	AOC7SD13	No	5.59E+00	No	No	</=PRG
Nickel	7440-02-0	mg/kg	4 : 4 : 4	100	1.46E+01	1.37E+01	1.54E+01	AOC7SD13	No	1.56E+02	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	4 : 4 : 4	100	7.43E+00	1.10E-01	2.90E+01	AOC7SD13	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	4 : 4 : 4	100	1.26E+03	8.37E+02	1.82E+03	AOC7SD10	Yes	NA	--	No	NA
Pyrene	129-00-0	mg/kg	4 : 4 : 4	100	7.97E+00	1.70E-01	3.10E+01	AOC7SD13	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	1 : 4 : 4	25	8.25E-01	1.40E+00	1.40E+00	AOC7SD10	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	4 : 4 : 4	100	1.24E+02	7.04E+01	2.14E+02	AOC7SD10	Yes	NA	--	No	NA
Toluene	108-88-3	mg/kg	3 : 3 : 4	75	1.21E-03	5.20E-04	1.90E-03	AOC7SD13	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	1 : 4 : 4	25	2.24E-02	2.60E-02	2.60E-02	AOC7SD10	No	1.10E-01	No	No	</=PRG
TOTAL XYLENES	TOTAL XY	mg/kg	2 : 2 : 4	50	8.70E-04	3.90E-04	1.35E-03	AOC7SD13	No	2.71E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	4 : 4 : 4	100	2.28E+01	1.84E+01	2.78E+01	AOC7SD10	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	4 : 4 : 4	100	8.31E+01	6.64E+01	9.55E+01	AOC7SD10	No	2.35E+03	No	No	</=PRG

Notes:
CAS - Chemical Abstracts Service.
COPC - Chemical of potential
EN - Essential nutrient.
FOD - Frequency of detection.
NA - Not available.
USEPA - United States Environmental Protection Agency.
(a) Frequency of Detection = Number of detected samples: Total number of samples.
(b) Percent of detected samples out of samples collected.
(c) Essential nutrients are not included as COPCs (calcium, magnesium, potassium, sodium).
(d) USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for residential soil. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects. See Table B-6 for detailed references.
(e) A chemical is identified as a COPC if it is not an essential nutrient, has an FOD greater than 5% (where 20 samples are available) and if the maximum detected concentration is greater than the PRG.

TABLE B-4b
COPC SCREENING - GREAT MIAMI RIVER SEDIMENT
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean (f)	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Great Miami River													
2-Butanone	78-93-3	mg/kg	4 : 10	40	1.95E-02	1.30E-02	3.30E-02	GMRSD8	No	2.23E+03	No	No	</=PRG
Acenaphthene	83-32-9	mg/kg	7 : 20	35	2.54E+00	2.60E-02	1.30E+01	GMRSD6	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	12 : 20	60	6.42E+00	3.60E-02	7.40E+01	GMRSD8	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	6 : 10	60	7.32E-02	6.40E-03	1.70E-01	GMRSD8	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	20 : 20	100	6.65E+03	2.46E+03	1.81E+04	GMRSD9	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	16 : 20	80	8.59E+00	1.90E-02	1.30E+02	GMRSD6	No	2.19E+03	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	20 : 20	100	4.18E+00	1.30E+00	1.06E+01	GMRSD9	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	20 : 20	100	9.55E+01	1.35E+01	5.23E+02	GMRSD5	No	5.37E+02	No	No	</=PRG
Benzene	71-43-2	mg/kg	8 : 10	80	2.30E-03	4.70E-04	9.70E-03	GMRSD6	No	6.43E-01	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	19 : 20	95	1.03E+01	7.60E-02	1.80E+02	GMRSD6	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	20 : 20	100	9.36E+00	3.60E-02	1.70E+02	GMRSD6	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	19 : 20	95	7.63E+00	1.10E-01	1.30E+02	GMRSD6	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	18 : 20	90	6.73E+00	7.30E-02	1.10E+02	GMRSD6	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	19 : 20	95	7.50E+00	4.50E-02	1.30E+02	GMRSD6	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	5 : 20	25	1.35E+00	6.80E-01	3.00E+00	GMRSD32	No	1.54E+01	No	No	</=PRG
Bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg	1 : 10	10	7.20E-02	7.20E-02	7.20E-02	GMRSD4	No	3.47E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	4 : 20	20	1.21E+00	7.60E-01	1.80E+00	GMRSD5	No	3.70E+00	No	No	</=PRG
Calcium	7440-70-2	mg/kg	20 : 20	100	1.20E+05	6.31E+04	2.07E+05	GMRSD32	Yes	NA	–	No	NA
Carbazole	86-74-8	mg/kg	3 : 10	30	5.72E+00	8.40E-02	1.70E+01	GMRSD6	No	2.43E+01	No	No	</=PRG
Carbon disulfide	75-15-0	mg/kg	5 : 10	50	3.05E-03	9.70E-04	5.00E-03	GMRSD2	No	3.55E+01	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	20 : 20	100	1.69E+01	4.30E+00	6.33E+01	GMRSD9	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	20 : 20	100	9.27E+00	1.50E-02	1.70E+02	GMRSD6	No	6.21E+01	Yes	Yes	>PRG
Cobalt	7440-48-4	mg/kg	2 : 20	10	9.90E+00	9.20E+00	1.06E+01	GMRSD14	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	20 : 20	100	2.93E+01	4.70E+00	1.63E+02	GMRSD5	No	3.13E+02	No	No	</=PRG
CYANIDE	57-12-5	mg/kg	1 : 10	10	8.86E+00	8.86E+00	8.86E+00	GMRSD1	No	1.22E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	10 : 10	100	2.74E-03	6.40E-04	8.70E-03	GMRSD2	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracene	53-70-3	mg/kg	15 : 20	75	1.91E+00	1.60E-02	2.60E+01	GMRSD6	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	1 : 10	10	1.10E+01	1.10E+01	1.10E+01	GMRSD6	No	1.45E+01	No	No	</=PRG
Ethylbenzene	100-41-4	mg/kg	3 : 10	30	1.10E-03	5.00E-04	2.00E-03	GMRSD2	No	1.90E+02	No	No	</=PRG
Fluoranthene	206-44-0	mg/kg	20 : 20	100	2.34E+01	6.90E-02	4.30E+02	GMRSD6	No	2.29E+02	Yes	Yes	>PRG
Fluorene	86-73-7	mg/kg	8 : 20	40	5.03E+00	1.90E-02	3.60E+01	GMRSD6	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	19 : 20	95	5.36E+00	6.50E-02	9.20E+01	GMRSD6	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	20 : 20	100	1.56E+04	6.80E+03	3.79E+04	GMRSD26	No	2.35E+03	Yes	Yes	>PRG

TABLE B-4b
COPC SCREENING - GREAT MIAMI RIVER SEDIMENT
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean (f)	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Lead	7439-92-1	mg/kg	20 : 20	100	1.91E+02	3.30E+00	2.98E+03	GMRSD28	No	4.00E+02	Yes	Yes	>PRG
Magnesium	7439-95-4	mg/kg	20 : 20	100	3.13E+04	1.61E+04	5.43E+04	GMRSD32	Yes	NA	--	No	NA
Manganese	7439-96-5	mg/kg	20 : 20	100	4.63E+02	1.91E+02	2.37E+03	GMRSD32	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	8 : 20	40	1.05E-01	4.00E-02	1.90E-01	GMRSD6	No	2.30E+00	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	10 : 10	100	3.76E-03	1.00E-03	1.30E-02	GMRSD2	No	2.59E+02	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	7 : 20	35	2.24E+00	4.20E-02	1.40E+01	GMRSD6	No	5.59E+00	Yes	Yes	>PRG
Nickel	7440-02-0	mg/kg	19 : 20	95	1.21E+01	5.00E+00	3.15E+01	GMRSD9	No	1.56E+02	No	No	</=PRG
p-Cresol (4-Methylphenol)	106-44-5	mg/kg	1 : 10	10	2.90E-01	2.90E-01	2.90E-01	GMRSD4	No	3.06E+01	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	19 : 20	95	2.12E+01	3.60E-02	3.80E+02	GMRSD6	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	20 : 20	100	1.08E+03	3.32E+02	2.82E+03	GMRSD9	Yes	NA	--	No	NA
Pyrene	129-00-0	mg/kg	20 : 20	100	2.05E+01	6.60E-02	3.80E+02	GMRSD6	No	2.32E+02	Yes	Yes	>PRG
Selenium	7782-49-2	mg/kg	9 : 20	45	1.87E+00	1.30E+00	3.00E+00	GMRSD25	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	20 : 20	100	2.78E+02	1.66E+02	8.49E+02	GMRSD32	Yes	NA	--	No	NA
Thallium	7440-28-0	mg/kg	7 : 20	35	3.64E+00	1.90E+00	7.80E+00	GMRSD32	No	5.16E-01	Yes	Yes	>PRG
Toluene	108-88-3	mg/kg	8 : 10	80	2.51E-03	8.40E-04	6.60E-03	GMRSD2	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	19 : 20	95	4.47E-01	1.31E-01	2.70E+00	GMRSD6	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	5 : 10	50	6.32E-03	1.91E-03	9.20E-03	GMRSD6	No	2.71E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	20 : 20	100	1.48E+01	7.30E+00	3.94E+01	GMRSD9	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	20 : 20	100	9.34E+01	1.56E+01	6.81E+02	GMRSD5	No	2.35E+03	No	No	</=PRG

Notes:
CAS - Chemical Abstracts Service.
COPC - Chemical of potential
EN - Essential nutrient.
FOD - Frequency of detection.
NA - Not available.
USEPA - United States Environmental Protection Agency.
(a) Frequency of Detection = Number of detected samples: Total number of samples.
(b) Percent of detected samples out of samples collected.
(c) Essential nutrients are not included as COPCs (calcium, magnesium, potassium, sodium).
(d) USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for residential soil. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects. See Table B-6 for detailed references.
(e) A chemical is identified as a COPC if it is not an essential nutrient, has an FOD greater than 5% (where 20 samples are available) and if the maximum detected concentration is greater than the PRG.
(f) Mean of detected results only.

TABLE B-4c
COPC SCREENING - HYDRIC SOIL AOC 22
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
AOC 22													
1,1-Biphenyl	92-52-4	mg/kg	2 : 18	11	2.90E+00	1.25E+00	4.56E+00	AOC22RA2	No	3.01E+02	No	No	</=PRG
1-METHYLNAPHTHA	90-12-0	mg/kg	14 : 17	82	4.95E-01	1.68E-02	4.71E+00	AOC22RA2	No	5.59E+00	No	No	</=PRG
2-Methylnaphthalene	91-57-6	mg/kg	17 : 18	94	1.36E+00	1.88E-02	1.52E+01	AOC22RA2	No	5.59E+00	Yes	Yes	>PRG
Acenaphthene	83-32-9	mg/kg	12 : 18	67	3.28E-01	1.50E-02	2.26E+00	AOC22RA2	No	3.68E+02	No	No	</=PRG
Acenaphthylene	208-96-8	mg/kg	18 : 18	100	3.44E+00	4.14E-02	2.35E+01	AOC22RA2	No	3.68E+02	No	No	</=PRG
Acetone	67-64-1	mg/kg	2 : 18	11	2.19E-02	7.54E-03	3.63E-02	AOC22RA1	No	1.41E+03	No	No	</=PRG
Aluminum	7429-90-5	mg/kg	18 : 18	100	9.54E+03	3.02E+03	1.92E+04	AOC22RA14	No	7.61E+03	Yes	Yes	>PRG
Anthracene	120-12-7	mg/kg	18 : 18	100	4.56E+00	3.96E-02	3.32E+01	AOC22RA2	No	2.19E+03	No	No	</=PRG
Antimony	7440-36-0	mg/kg	17 : 18	94	1.35E+00	6.28E-01	2.49E+00	AOC22RA8	No	3.13E+00	No	No	</=PRG
Arsenic	7440-38-2	mg/kg	18 : 18	100	8.05E+00	3.26E+00	1.43E+01	AOC22RA4	No	3.90E-01	Yes	Yes	>PRG
Barium	7440-39-3	mg/kg	18 : 18	100	1.07E+02	3.56E+01	2.25E+02	AOC22RA14	No	5.37E+02	No	No	</=PRG
Benzo(a)anthracene	56-55-3	mg/kg	18 : 18	100	8.16E+00	2.77E-01	5.01E+01	AOC22RA11	No	6.21E-01	Yes	Yes	>PRG
Benzo(a)pyrene	50-32-8	mg/kg	18 : 18	100	6.00E+00	2.92E-01	3.76E+01	AOC22RA11	No	6.21E-02	Yes	Yes	>PRG
Benzo(b)fluoranthene	205-99-2	mg/kg	18 : 18	100	6.39E+00	2.83E-01	4.08E+01	AOC22RA2	No	6.21E-01	Yes	Yes	>PRG
Benzo(g,h,i)perylene	191-24-2	mg/kg	18 : 18	100	2.80E+00	1.58E-01	1.81E+01	AOC22RA11	No	2.32E+02	No	No	</=PRG
Benzo(k)fluoranthene	207-08-9	mg/kg	18 : 18	100	5.58E+00	2.35E-01	3.81E+01	AOC22RA11	No	6.21E+00	Yes	Yes	>PRG
Beryllium	7440-41-7	mg/kg	18 : 18	100	1.15E+00	1.38E-01	3.48E+00	AOC22RA14	No	1.54E+01	No	No	</=PRG
Cadmium	7440-43-9	mg/kg	18 : 18	100	1.23E+00	2.16E-01	3.31E+00	AOC22RA8	No	3.70E+00	No	No	</=PRG
Calcium	7440-70-2	mg/kg	18 : 18	100	8.37E+04	5.38E+04	1.40E+05	AOC22RA9	Yes	NA	--	No	EN
Carbazole	86-74-8	mg/kg	7 : 18	39	4.82E+00	1.06E-01	1.55E+01	AOC22RA2	No	2.43E+01	No	No	</=PRG
Chromium (total)	7440-47-3	mg/kg	18 : 18	100	3.30E+01	7.42E+00	9.20E+01	AOC22RA16	No	2.20E+01	Yes	Yes	>PRG
Chrysene	218-01-9	mg/kg	18 : 18	100	7.40E+00	2.91E-01	4.48E+01	AOC22RA11	No	6.21E+01	No	No	</=PRG
Cobalt	7440-48-4	mg/kg	18 : 18	100	5.71E+00	2.44E+00	1.03E+01	AOC22RA8	No	1.40E+02	No	No	</=PRG
Copper	7440-50-8	mg/kg	18 : 18	100	3.01E+01	1.16E+01	6.55E+01	AOC22RA8	No	3.13E+02	No	No	</=PRG
Cyclohexane	110-82-7	mg/kg	1 : 18	6	7.34E-02	7.34E-02	7.34E-02	AOC22RA18	No	1.40E+02	No	No	</=PRG
Dibenz(a,h)anthracen	53-70-3	mg/kg	18 : 18	100	9.86E-01	4.89E-02	5.63E+00	AOC22RA11	No	6.21E-02	Yes	Yes	>PRG
Dibenzofuran	132-64-9	mg/kg	4 : 18	22	9.85E+00	1.59E-01	2.13E+01	AOC22RA2	No	1.45E+01	Yes	Yes	>PRG
Fluoranthene	206-44-0	mg/kg	18 : 18	100	2.34E+01	5.73E-01	1.44E+02	AOC22RA2	No	2.29E+02	No	No	</=PRG
Fluorene	86-73-7	mg/kg	17 : 18	94	3.92E+00	1.86E-02	3.31E+01	AOC22RA2	No	2.75E+02	No	No	</=PRG
Indeno(1,2,3-cd)pyren	193-39-5	mg/kg	18 : 18	100	2.73E+00	1.49E-01	1.71E+01	AOC22RA11	No	6.21E-01	Yes	Yes	>PRG
Iron	7439-89-6	mg/kg	18 : 18	100	3.10E+04	8.94E+03	6.92E+04	AOC22RA4	No	2.35E+03	Yes	Yes	>PRG
Lead	7439-92-1	mg/kg	17 : 17	100	1.07E+02	1.02E+01	3.41E+02	AOC22RA5	No	4.00E+02	No	No	</=PRG
Magnesium	7439-95-4	mg/kg	18 : 18	100	2.18E+04	1.84E+04	2.63E+04	AOC22RA15	Yes	NA	--	No	EN

TABLE B-4c
COPC SCREENING - HYDRIC SOIL AOC 22
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	% FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	PRG (d)	Is Max > PRG?	COPC? (e)	Reason
Manganese	7439-96-5	mg/kg	18 : 18	100	1.12E+03	2.36E+02	3.18E+03	AOC22RA10	No	1.76E+02	Yes	Yes	>PRG
Mercury	7439-97-6	mg/kg	17 : 18	94	1.82E-01	2.37E-02	5.78E-01	AOC22RA8	No	2.30E+00	No	No	</=PRG
Methyl acetate	79-20-9	mg/kg	2 : 18	11	7.86E-01	3.83E-01	1.19E+00	AOC22RA18	No	2.21E+03	No	No	</=PRG
Methylcyclohexane	108-87-2	mg/kg	1 : 18	6	2.66E-01	2.66E-01	2.66E-01	AOC22RA18	No	2.59E+02	No	No	</=PRG
Naphthalene	91-20-3	mg/kg	18 : 18	100	4.18E+00	2.94E-02	5.10E+01	AOC22RA2	No	5.59E+00	Yes	Yes	>PRG
Nickel	7440-02-0	mg/kg	18 : 18	100	1.74E+01	9.20E+00	3.35E+01	AOC22RA8	No	1.56E+02	No	No	</=PRG
Phenanthrene	85-01-8	mg/kg	18 : 18	100	1.95E+01	1.94E-01	1.37E+02	AOC22RA2	No	2.19E+03	No	No	</=PRG
Potassium	7440-09-7	mg/kg	18 : 18	100	1.24E+03	5.38E+02	1.73E+03	AOC22RA18	Yes	NA	–	No	EN
Pyrene	129-00-0	mg/kg	18 : 18	100	1.54E+01	4.24E-01	9.71E+01	AOC22RA11	No	2.32E+02	No	No	</=PRG
Selenium	7782-49-2	mg/kg	14 : 18	78	9.92E-01	5.42E-01	2.11E+00	AOC22RA9	No	3.91E+01	No	No	</=PRG
Silver	7440-22-4	mg/kg	12 : 18	67	5.14E-01	1.66E-01	1.06E+00	AOC22RA8	No	3.91E+01	No	No	</=PRG
Sodium	7440-23-5	mg/kg	18 : 18	100	2.57E+02	1.09E+02	9.75E+02	AOC22RA18	Yes	NA	–	No	EN
Thallium	7440-28-0	mg/kg	18 : 18	100	2.49E-01	5.97E-02	6.11E-01	AOC22RA2	No	5.16E-01	Yes	Yes	>PRG
Toluene	108-88-3	mg/kg	1 : 18	6	1.03E-01	1.03E-01	1.03E-01	AOC22RA18	No	6.60E+01	No	No	</=PRG
TOTAL PCBs	Total PCBs	mg/kg	18 : 18	100	5.96E-01	6.79E-02	2.37E+00	AOC22RA8	No	1.10E-01	Yes	Yes	>PRG
TOTAL XYLENES	TOTAL XY	mg/kg	1 : 18	6	2.65E-01	2.65E-01	2.65E-01	AOC22RA18	No	2.71E+01	No	No	</=PRG
Vanadium	7440-62-2	mg/kg	18 : 18	100	1.67E+01	7.55E+00	3.05E+01	AOC22RA4	No	7.82E+00	Yes	Yes	>PRG
Zinc	7440-66-6	mg/kg	17 : 17	100	3.33E+02	3.55E+01	1.36E+03	AOC22RA5	No	2.35E+03	No	No	</=PRG

Notes:
CAS - Chemical Abstracts Service.
COPC - Chemical of potential
EN - Essential nutrient.
FOD - Frequency of detection.
NA - Not available.
USEPA - United States Environmental Protection Agency.
(a) Frequency of Detection = Number of detected samples: Total number of samples.
(b) Percent of detected samples out of samples collected.
(c) Essential nutrients are not included as COPCs (calcium, magnesium, potassium, sodium).
(d) USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for residential soil. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects. See Table B-6 for detailed references.
(e) A chemical is identified as a COPC if it is not an essential nutrient, has an FOD greater than 5% (where 20 samples are available) and if the maximum detected concentration is greater than the PRG.

TABLE B-5
COPC SCREENING - SURFACE WATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	%FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	Surface WaterScreening Level (d)	Is Max > Screening Value?	COPC In Surface Water? (e)	Reason
AOC 19													
Aluminum	7429-90-5	ug/l	1 : 1 : 1	100	3.41E+03	3.41E+03	3.41E+03	GMRSW10	No	3.65E+03	No	No	</=Screening Level
Barium	7440-39-3	ug/l	1 : 1 : 1	100	9.55E+01	9.55E+01	9.55E+01	GMRSW10	No	2.00E+03	No	No	</=Screening Level
Calcium	7440-70-2	ug/l	1 : 1 : 1	100	6.75E+04	6.75E+04	6.75E+04	GMRSW10	Yes	NA	–	no	EN
Chromium (total)	7440-47-3	ug/l	1 : 1 : 1	100	4.70E+00	4.70E+00	4.70E+00	GMRSW10	No	1.00E+02	No	No	</=Screening Level
Iron	7439-89-6	ug/l	1 : 1 : 1	100	2.78E+03	2.78E+03	2.78E+03	GMRSW10	No	3.00E+02	Yes	Yes	>Screening Level
Lead	7439-92-1	ug/l	1 : 1 : 1	100	3.80E+00	3.80E+00	3.80E+00	GMRSW10	No	1.50E+01	No	No	</=Screening Level
Magnesium	7439-95-4	ug/l	1 : 1 : 1	100	2.70E+04	2.70E+04	2.70E+04	GMRSW10	Yes	NA	–	no	EN
Manganese	7439-96-5	ug/l	1 : 1 : 1	100	5.36E+01	5.36E+01	5.36E+01	GMRSW10	No	8.76E+01	No	No	</=Screening Level
Mercury	7439-97-6	ug/l	1 : 1 : 1	100	3.00E-02	3.00E-02	3.00E-02	GMRSW10	No	1.20E-02	Yes	Yes	>Screening Level
Nickel	7440-02-0	ug/l	1 : 1 : 1	100	4.10E+00	4.10E+00	4.10E+00	GMRSW10	No	6.10E+02	No	No	</=Screening Level
Potassium	7440-09-7	ug/l	1 : 1 : 1	100	5.76E+03	5.76E+03	5.76E+03	GMRSW10	Yes	NA	–	no	EN
Sodium	7440-23-5	ug/l	1 : 1 : 1	100	1.90E+04	1.90E+04	1.90E+04	GMRSW10	Yes	NA	–	no	EN
Vanadium	7440-62-2	ug/l	1 : 1 : 1	100	8.60E+00	8.60E+00	8.60E+00	GMRSW10	No	3.65E+00	Yes	Yes	>Screening Level
AOC 7													
Acetone	67-64-1	ug/l	1 : 1 : 4	25	2.40E+00	2.40E+00	2.40E+00	AOC7SW8	No	5.48E+02	No	No	</=Screening Level
Aluminum	7429-90-5	ug/l	4 : 4 : 4	100	1.93E+03	8.66E+02	3.79E+03	AOC7SW7	No	3.65E+03	Yes	Yes	>Screening Level
Barium	7440-39-3	ug/l	1 : 4 : 4	25	4.57E+01	1.02E+02	1.02E+02	AOC7SW8	No	2.00E+03	No	No	</=Screening Level
Calcium	7440-70-2	ug/l	4 : 4 : 4	100	6.78E+04	5.49E+04	7.74E+04	AOC7SW8	Yes	NA	–	no	EN
Cobalt	7440-48-4	ug/l	1 : 1 : 4	25	1.50E+00	1.50E+00	1.50E+00	AOC7SW8	No	7.30E+01	No	No	</=Screening Level
CYANIDE	57-12-5	ug/L	1 : 4 : 4	25	6.35E+00	1.04E+01	1.04E+01	AOC7SW7	No	2.00E+02	No	No	</=Screening Level
Fluoranthene	206-44-0	ug/l	1 : 1 : 4	25	5.60E-02	5.60E-02	5.60E-02	AOC7SW8	No	3.00E+02	No	No	</=Screening Level
Iron	7439-89-6	ug/l	4 : 4 : 4	100	1.48E+03	6.16E+02	2.65E+03	AOC7SW7	No	3.00E+02	Yes	Yes	>Screening Level
Lead	7439-92-1	ug/l	2 : 4 : 4	50	2.02E+00	2.40E+00	3.30E+00	AOC7SW8	No	1.50E+01	No	No	</=Screening Level
Magnesium	7439-95-4	ug/l	4 : 4 : 4	100	2.31E+04	1.74E+04	3.05E+04	AOC7SW8	Yes	NA	–	no	EN
Manganese	7439-96-5	ug/l	4 : 4 : 4	100	2.94E+01	1.71E+01	4.95E+01	AOC7SW8	No	8.76E+01	No	No	</=Screening Level
Naphthalene	91-20-3	ug/l	1 : 4 : 4	25	2.60E-01	7.50E-01	7.50E-01	AOC7SW9	No	6.20E-01	Yes	Yes	>Screening Level

TABLE B-5
COPC SCREENING - SURFACE WATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	%FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	Surface WaterScreening Level (d)	Is Max > Screening Value?	COPC in Surface Water? (e)	Reason
Nickel	7440-02-0	ug/l	1 : 4 : 4	25	2.17E+00	3.70E+00	3.70E+00	AOC7SW8	No	6.10E+02	No	No	</=Screening Level
Potassium	7440-09-7	ug/l	4 : 4 : 4	100	2.46E+03	1.32E+03	4.88E+03	AOC7SW8	Yes	NA	–	no	EN
Sodium	7440-23-5	ug/l	4 : 4 : 4	100	1.77E+04	1.26E+04	2.54E+04	AOC7SW8	Yes	NA	–	no	EN
Vanadium	7440-62-2	ug/l	1 : 4 : 4	25	2.79E+00	4.70E+00	4.70E+00	AOC7SW8	No	3.65E+00	Yes	Yes	>Screening Level
Zinc	7440-66-6	ug/l	4 : 4 : 4	100	1.04E+01	5.80E+00	1.41E+01	AOC7SW7	No	9.10E+03	No	No	</=Screening Level
Great Miami River													
4-Methyl-2-pentanone	108-10-1	ug/l	1 : 1 : 5	20	1.80E+00	1.80E+00	1.80E+00	GMRSD2	No	1.99E+02	No	No	</=Screening Level
Acetone	67-64-1	ug/l	1 : 1 : 5	20	4.20E+00	4.20E+00	4.20E+00	GMRSD2	No	5.48E+02	No	No	</=Screening Level
Aluminum	7429-90-5	ug/l	5 : 5 : 5	100	6.80E+02	6.16E+02	7.14E+02	GMRSD1	No	3.65E+03	No	No	</=Screening Level
Barium	7440-39-3	ug/l	5 : 5 : 5	100	9.69E+01	9.34E+01	1.01E+02	GMRSD1	No	2.00E+03	No	No	</=Screening Level
Calcium	7440-70-2	ug/l	5 : 5 : 5	100	8.19E+04	7.98E+04	8.36E+04	GMRSD2	Yes	NA	–	no	EN
Fluoranthene	206-44-0	ug/l	1 : 1 : 5	20	5.00E-02	5.00E-02	5.00E-02	GMRSD1	No	3.00E+02	No	No	</=Screening Level
Iron	7439-89-6	ug/l	5 : 5 : 5	100	7.28E+02	6.86E+02	7.73E+02	GMRSD3	No	3.00E+02	Yes	Yes	>Screening Level
Lead	7439-92-1	ug/l	5 : 5 : 5	100	2.54E+00	2.30E+00	2.80E+00	MRSD1, GMRSI	No	1.50E+01	No	No	</=Screening Level
Magnesium	7439-95-4	ug/l	5 : 5 : 5	100	3.27E+04	3.10E+04	3.44E+04	GMRSD8	Yes	NA	–	no	EN
Manganese	7439-96-5	ug/l	5 : 5 : 5	100	2.51E+01	2.36E+01	2.72E+01	GMRSD1	No	8.76E+01	No	No	</=Screening Level
Mercury	7439-97-6	ug/l	2 : 5 : 5	40	6.20E-02	9.00E-02	1.90E-01	GMRSD8	No	1.20E-02	Yes	Yes	>Screening Level
Methylene chloride	75-09-2	ug/l	2 : 5 : 5	40	4.92E-01	3.00E-01	6.60E-01	GMRSD2	No	5.00E+00	No	No	</=Screening Level
Nickel	7440-02-0	ug/l	5 : 5 : 5	100	2.18E+00	1.70E+00	2.50E+00	GMRSD8	No	6.10E+02	No	No	</=Screening Level
Potassium	7440-09-7	ug/l	5 : 5 : 5	100	4.12E+03	3.88E+03	4.37E+03	GMRSD4	Yes	NA	–	no	EN
Sodium	7440-23-5	ug/l	5 : 5 : 5	100	2.87E+04	2.85E+04	2.90E+04	GMRSD8	Yes	NA	–	no	EN
Vanadium	7440-62-2	ug/l	5 : 5 : 5	100	2.60E+00	2.40E+00	2.70E+00	MRSD4, GMRSI	No	3.65E+00	No	No	</=Screening Level

TABLE B-5
COPC SCREENING - SURFACE WATER
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
HUMAN HEALTH RISK ASSESSMENT

ENSR | AECOM

Chemical	CAS	Units	FOD (a)	%FOD (b)	Mean	Minimum Detect	Maximum Detect	Location of Maximum Detect	Essential Nutrient? (c)	Surface WaterScreening Level (d)	Is Max > Screening Value?	COPC in Surface Water? (e)	Reason

Notes:
CAS - Chemical Abstracts Service.
COPC - Chemical of potential
EN - Essential nutrient.
FOD - Frequency of detection.
NA - Not available.
(a) Frequency of Detection = Number of detected samples: Total number of samples.
(b) Percent of detected samples out of samples collected.
(c) Essential nutrients are not included as COPCs (calcium, magnesium, potassium, sodium).
(d) Surface water screening levels were used according to the following hierarchy. See Table B-8 for detailed references:
1. OAC. 3745-1-34. Water Quality Criteria for the Ohio River Drainage Basin. Drinking water values.
2. USEPA. 2006. National Recommended Water Quality Criteria. Ambient Water Quality Criteria (AWQC) for human health consumption of water and organism. In the absence of an AWQC, the screening level was the lower of:
USEPA, 2004. 2004 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-02-038. Maximum Contaminant Levels (MCL). Winter 2004.
USEPA, 2004. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for Tap Water.PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects.
(e) A chemical is identified as a COPC if it is not an essential nutrient, has an FOD greater than 5% (where 20 samples are available) and if the maximum detected concentration is greater than the surface water screening level.

TABLE B-6
SOIL AND SEDIMENT SCREENING VALUES
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

Chemical	CAS	PRG (a) (mg/kg)	
1,1,1-Trichloroethane	71-55-6	2.00E+02	(b)
1,1-Biphenyl	92-52-4	3.01E+02	(c)
1,2,4-Trichlorobenzene	120-82-1	6.22E+00	(c)
1,2-Dichlorobenzene	95-50-1	1.10E+02	(c)
1,2-Dichloroethane	107-06-2	2.78E-01	(d)
1,3-Dichlorobenzene	541-73-1	5.31E+01	(c)
1,4-Dichlorobenzene	106-46-7	3.45E+00	(d)
2,4-Dimethylphenol	105-67-9	1.22E+02	(c)
2-Butanone	78-93-3	2.23E+03	(c)
2-Hexanone	591-78-6	5.28E+02	(c,h)
1-Methylnaphthalene	90-12-0	5.59E+00	(c,i)
2-Methylnaphthalene	91-57-6	5.59E+00	(c,i)
4-Methyl-2-pentanone	108-10-1	5.28E+02	(c)
Acenaphthene	83-32-9	3.68E+02	(c)
Acenaphthylene	208-96-8	3.68E+02	(c,j)
Acetone	67-64-1	1.41E+03	(c)
Acetophenone	98-86-2	7.80E+02	(c,o)
Aluminum	7429-90-5	7.61E+03	(c)
Anthracene	120-12-7	2.19E+03	(c)
Antimony	7440-36-0	3.13E+00	(c)
Arsenic	7440-38-2	3.90E-01	(d)
Barium	7440-39-3	5.37E+02	(c)
Benzaldehyde	100-52-7	6.11E+02	(c)
Benzene	71-43-2	6.43E-01	(d)
Benzo(a)anthracene	56-55-3	6.21E-01	(d)
Benzo(a)pyrene	50-32-8	6.21E-02	(d)
Benzo(b)fluoranthene	205-99-2	6.21E-01	(d)
Benzo(g,h,i)perylene	191-24-2	2.32E+02	(c,k)
Benzo(k)fluoranthene	207-08-9	6.21E+00	(d)
Beryllium	7440-41-7	1.54E+01	(c)
Bis(2-Ethylhexyl)phthalate	117-81-7	3.47E+01	(d)
Butylbenzylphthalate	85-68-7	1.22E+03	(c)
Cadmium	7440-43-9	3.70E+00	(c)
Calcium	7440-70-2	NA	
Carbazole	86-74-8	2.43E+01	(d)
Carbon disulfide	75-15-0	3.55E+01	(c)
Chlorobenzene	108-90-7	1.51E+01	(c)
Chloroform	67-66-3	2.21E-01	(d)
Chloromethane	74-87-3	4.69E+00	(c)
Chromium (total)	7440-47-3	2.20E+01	(f,l)
Chrysene	218-01-9	6.21E+01	(d)
cis-1,2-Dichloroethene	156-59-2	4.29E+00	(c)
Cobalt	7440-48-4	1.40E+02	(f)
Copper	7440-50-8	3.13E+02	(c)
CYANIDE	57-12-5	1.22E+02	(c)
Cyclohexane	110-82-7	1.40E+02	(e)
Dibenz(a,h)anthracene	53-70-3	6.21E-02	(d)
Dibenzofuran	132-64-9	1.45E+01	(c)
Dichlorodifluoromethane	75-71-8	9.39E+00	(c)
Dimethylphthalate	131-11-3	6.10E+04	(g)
Di-n-butylphthalate	84-74-2	6.11E+02	(c)
Di-n-octylphthalate	117-84-0	2.44E+02	(c)

TABLE B-6
SOIL AND SEDIMENT SCREENING VALUES
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

Chemical	CAS	PRG (a) (mg/kg)	
2,3,7,8 Dioxin	Dioxin	3.90E-06	(d)
Ethylbenzene	100-41-4	1.90E+02	(c)
Fluoranthene	206-44-0	2.29E+02	(c)
Fluorene	86-73-7	2.75E+02	(c)
Indeno(1,2,3-cd)pyrene	193-39-5	6.21E-01	(d)
Iron	7439-89-6	2.35E+03	(c)
Isopropylbenzene	98-82-8	1.57E+01	(c)
Lead	7439-92-1	4.00E+02	NA
Magnesium	7439-95-4	NA	
Manganese	7439-96-5	1.76E+02	(c)
Mercury	7439-97-6	2.30E+00	(c,m)
Methyl acetate	79-20-9	2.21E+03	(c)
Methylcyclohexane	108-87-2	2.59E+02	(c)
Methylene chloride	75-09-2	9.11E+00	(d)
Naphthalene	91-20-3	5.59E+00	(c)
Nickel	7440-02-0	1.56E+02	(c)
o-Cresol (2-Methylphenol)	95-48-7	3.06E+02	(c)
p-Cresol (4-Methylphenol)	106-44-5	3.06E+01	(c)
Phenanthrene	85-01-8	2.19E+03	(c,n)
Phenol	108-95-2	1.83E+03	(c)
Potassium	7440-09-7	NA	
Pyrene	129-00-0	2.32E+02	(c)
Selenium	7782-49-2	3.91E+01	(c)
Silver	7440-22-4	3.91E+01	(c)
Sodium	7440-23-5	NA	
Styrene	100-42-5	4.40E+02	(b)
Tetrachloroethene	127-18-4	4.84E-01	(d)
Thallium	7440-28-0	5.16E-01	(c)
Toluene	108-88-3	6.60E+01	(c)
Total PCBs	PCB	1.10E-01	(c)
Xylenes, Total	Xyl	2.71E+01	(c)
trans-1,2-Dichloroethene	156-60-5	6.95E+00	(c)
trans-1,3-Dichloropropene	10061-02-6	7.77E-01	(d)

TABLE B-6
SOIL AND SEDIMENT SCREENING VALUES
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

Chemical	CAS	PRG (a) (mg/kg)	
Trichloroethene	79-01-6	5.30E-02	(d)
Trichlorofluoromethane	75-69-4	3.86E+01	(c)
Vanadium	7440-62-2	7.82E+00	(c)
Zinc	7440-66-6	2.35E+03	(c)

Notes:
CAS - Chemical Abstracts Service.
PRG - Preliminary Remediation Goal.
(a) USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for Residential Soil PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects.
(b) PRG based on soil saturation limit. PRG based on HQ of 0.1 is lower, and is used to evaluate this chemical.
(c) PRG is based on noncarcinogenic effects and hazard quotient of 0.1.
(d) PRG is based on potentially carcinogenic effects and risk level of 1E-6.
(e) PRG is based on saturation limit. PRG based on HQ of 0.1 is higher.
(f) PRG based on HQ of 0.1 is lower than PRG presented in (a). Thus, the PRG based on HQ 0.1 is used to evaluate this chemical.
(g) PRG based on a maximum level of 100,000 mg/kg. PRG based on HQ of 0.1 is lower, and is used to evaluate this chemical.
(h) No value listed. Therefore, value for 4-methyl-isobutyl ketone used due to structural similarity.
(i) No value listed. Therefore, value for naphthalene used due to structural similarity.
(j) No value listed. Therefore, value for acenaphthene used due to structural similarity.
(k) No value listed. Therefore, value for pyrene used due to structural similarity.
(l) PRG for hexavalent chromium.
(m) PRG for inorganic mercury.
(n) No value listed. Therefore, value for anthracene used due to structural similarity.
(o) No PRG available. Therefore, USEPA Region 3 RBC (April 2006) used and adjusted to an HQ of 0.1.

TABLE B-7
GROUNDWATER SCREENING VALUES
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

Chemical	cas_m	MCL (a) (ug/L)	PRG (b) (ug/L)	Selected Value (c) (ug/L)	Vapor Intrusion Screening Level (d) (ug/L)
1,1-Biphenyl	92-52-4	–	3.04E+01	3.04E+01	(e)
2,4-Dimethylphenol	105-67-9	–	7.30E+01	7.30E+01	(f)
2-Methylnaphthalene	91-57-6	–	6.20E-01 (i)	6.20E-01	3.30E+02
Acenaphthene	83-32-9	–	3.65E+01	3.65E+01	(e)
Acenaphthylene	208-96-8	–	3.65E+01 (g)	3.65E+01	(g)
Acetone	67-64-1	–	5.48E+02	5.48E+02	2.20E+04
Acetophenone	98-86-2	–	6.10E+01 (j)	6.10E+01	8.00E+04
Aluminum	7429-90-5	–	3.65E+03	3.65E+03	NA
Anthracene	120-12-7	–	1.83E+02	1.83E+02	(e)
Arsenic	7440-38-2	1.00E+01	4.48E-02	4.48E-02	NA
Barium	7440-39-3	2.00E+03	2.55E+02	2.55E+02	NA
Benzene	71-43-2	5.00E+00	3.54E-01	3.54E-01	5.00E+00
Benzo(a)anthracene	56-55-3	–	9.21E-02	9.21E-02	(f)
Benzo(a)pyrene	50-32-8	2.00E-01	9.21E-03	9.21E-03	(f)
Benzo(b)fluoranthene	205-99-2	–	9.21E-02	9.21E-02	(e)
Benzo(g,h,i)perylene	191-24-2	–	1.83E+01 (k)	1.83E+01	(f)
Benzo(k)fluoranthene	207-08-9	–	9.21E-01	9.21E-01	(e,f)
Cadmium	7440-43-9	5.00E+00	1.82E+00	1.82E+00	NA
Calcium	7440-70-2	–	EN		NA
Caprolactam	105-60-2	–	1.82E+03	1.82E+03	(f)
Carbazole	86-74-8	–	3.36E+00	3.36E+00	(f)
Carbon disulfide	75-15-0	–	1.04E+02	1.04E+02	5.60E+01
Chromium (total)	7440-47-3	1.00E+02	1.10E+01 (l)	1.10E+01	NA
Chrysene	218-01-9	–	9.21E+00	9.21E+00	(e)
cis-1,2-Dichloroethene	156-59-2	7.00E+01	6.08E+00	6.08E+00	2.10E+01
CYANIDE	57-12-5	2.00E+02	7.30E+01	7.30E+01	NA
Dibenz(a,h)anthracene	53-70-3	–	9.21E-03	9.21E-03	(f)
Dibenzofuran	132-64-9	–	1.22E+00	1.22E+00	(e)
Di-n-butylphthalate	84-74-2	–	3.65E+02	3.65E+02	(e,f)
Ethylbenzene	100-41-4	7.00E+02	1.34E+02	1.34E+02	7.00E+02
Fluoranthene	206-44-0	–	1.46E+02	1.46E+02	(e)
Fluorene	86-73-7	–	2.43E+01	2.43E+01	(e)
Indeno(1,2,3-cd)pyrene	193-39-5	–	9.21E-02	9.21E-02	(e,f)
Iron	7439-89-6	–	1.09E+03	1.09E+03	NA
Isopropylbenzene	98-82-8	–	6.58E+01	6.58E+01	8.40E-01
Lead	7439-92-1	1.50E+01	1.50E+01	1.50E+01	NA
Magnesium	7439-95-4	–	EN		NA
Manganese	7439-96-5	–	8.76E+01	8.76E+01	NA
Mercury	7439-97-6	2.00E+00	1.10E+00 (m)	1.10E+00	NA
Naphthalene	91-20-3	–	6.20E-01	6.20E-01	1.50E+01
o-Cresol (2-Methylphenol)	95-48-7	–	1.82E+02	1.82E+02	(f)
p-Cresol (4-Methylphenol)	106-44-5	–	1.82E+01	1.82E+01	(f)
Phenanthrene	85-01-8	–	1.80E+02 (h)	1.80E+02	(h)
Phenol	108-95-2	–	1.09E+03	1.09E+03	(f)
Potassium	7440-09-7	–	EN		NA
Pyrene	129-00-0	–	1.83E+01	1.83E+01	(e)
Selenium	7782-49-2	5.00E+01	1.82E+01	1.82E+01	NA
Sodium	7440-23-5	–	EN		NA
Styrene	100-42-5	1.00E+02	1.64E+02	1.00E+02	8.90E+02
Toluene	108-88-3	1.00E+03	7.23E+01	7.23E+01	1.50E+02

TABLE B-7
GROUNDWATER SCREENING VALUES
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

Chemical	cas_rn	MCL (a) (ug/L)	PRG (b) (ug/L)	Selected Value (c) (ug/L)	Vapor Intrusion Screening Level (d) (ug/L)
Xylenes (total)	TOTAL XYLENES	1.00E+04	2.06E+01	2.06E+01	2.20E+03
Vanadium	7440-62-2	--	3.65E+00	3.65E+00	NA
Zinc	7440-66-6	--	1.09E+03	1.09E+03	NA
1,2,4-Trichlorobenzene	120-82-1	7.00E+01	7.16E-01	7.16E-01	3.40E+02
1-Methylnaphthalene	90-12-0	--	6.20E-01 (i)	6.20E-01	3.30E+02 (n)
Antimony	7440-36-0	6.00E+00	1.46E+00	1.46E+00	NA
Beryllium	7440-41-7	4.00E+00	7.30E+00	4.00E+00	NA
Bis(2-Ethylhexyl)phthalate	117-81-7	6.00E+00	4.80E+00	4.80E+00	(e,f)
Chlorobenzene	108-90-7	1.00E+02	1.06E+01	1.06E+01	3.90E+01
Chloromethane	74-87-3	--	1.58E+01	1.58E+01	6.70E+00
Cobalt	7440-48-4	--	7.30E+01	7.30E+01	NA
Copper	7440-50-8	1.30E+03	1.46E+02	1.46E+02	NA
Cyclohexane	110-82-7	--	1.03E+03	1.03E+03	7.10E+01 (o)
Methylcyclohexane	108-87-2	--	5.22E+02	5.22E+02	7.10E+01
Nickel	7440-02-0	--	7.30E+01	7.30E+01	NA
Silver	7440-22-4	--	1.82E+01	1.82E+01	NA
Tetrachloroethene	127-18-4	5.00E+00	1.04E-01	1.04E-01	5.00E+00
Thallium	7440-28-0	2.00E+00	2.41E-01	2.41E-01	NA
Trichloroethene	79-01-6	5.00E+00	2.80E-02	2.80E-02	5.00E+00
Vinyl chloride	75-01-4	2.00E+00	1.98E-02	1.98E-02	2.00E+00

Notes:
-- Not Available.
CAS - Chemical Abstracts Service.
EN - Essential nutrient.
MCL - Maximum Contaminant Level.
NA - Not Applicable. Inorganic chemicals are not volatile.
PRG - Preliminary Remediation Goal.
(a) USEPA, 2004b. 2004 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-02-038. Maximum Contaminant Levels (MCL). Winter 2004.
(b) USEPA, 2004a. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for Tap Water. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects.
(c) Lower of MCL and PRG.
(d) USEPA Draft Guidance for Evaluating the Vapor Intrusion To Indoor Air Pathway from Groundwater and Soils. November 29, 2002. Table 2c. Risk level of 1E-6. Screening Levels based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects.
(e) Chemical is not considered sufficiently toxic for evaluation in the vapor intrusion pathway because the vapor concentration of the pure component poses an incremental lifetime risk less than 1E-6 or a hazard index less than one. Per guidance in (d).
(f) Chemical is not considered sufficiently volatile for evaluation in the vapor intrusion pathway because the Henry's Law Constant is less than 1E-5 atm-m3/mol. Per guidance in (d).
(g) No value listed. Therefore, value for acenaphthene used due to structural similarity.
(h) No value listed. Therefore, value for anthracene used due to structural similarity.
(i) No value listed. Therefore, value for naphthalene used due to structural similarity.
(j) No PRG available. Therefore, USEPA Region 3 RBC (April 2006) used.
(k) No value listed. Therefore, value for pyrene used due to structural similarity.
(l) PRG for hexavalent chromium.
(m) PRG for inorganic mercury.
(n) No value listed. Therefore, value for 2-methylnaphthalene used due to structural similarity.
(o) No value listed. Therefore, value for cyclohexane used due to structural similarity.

TABLE B-8
SURFACE WATER SCREENING VALUES
AK STEEL FORMER ARMCO HAMILTON PLANT
NEW MIAMI, BUTLER COUNTY, OHIO
BASELINE HUMAN HEALTH RISK ASSESSMENT

Chemical	CAS	Ohio (a) (ug/L)	AWQC (b) (ug/L)	MCL (c) (ug/L)	PRG (d) (ug/L)	Selected (e) (ug/L)
4-Methyl-2-pentanone	108-10-1	NA	NA	NA	1.99E+02	1.99E+02
Acetone	67-64-1	NA	NA	NA	5.48E+02	5.48E+02
Aluminum	7429-90-5	NA	NA	NA	3.65E+03	3.65E+03
Barium	7440-39-3	2.00E+03	NA	2.00E+03	2.55E+02	2.00E+03
Calcium	7440-70-2	NA	NA	NA	NA	EN
Chromium (total)	7440-47-3	1.00E+02	NA	1.00E+02	1.10E+01 (f)	1.00E+02
Cobalt	7440-48-4	NA	NA	NA	7.30E+01	7.30E+01
Cyanide	57-12-5	2.00E+02	1.40E+02	2.00E+02	7.30E+01	2.00E+02
Fluoranthene	206-44-0	3.00E+02	1.30E+02	NA	1.46E+02	3.00E+02
Iron	7439-89-6	3.00E+02	NA	NA	1.09E+03	3.00E+02
Lead	7439-92-1	NA	NA	1.50E+01	1.50E+01	1.50E+01
Magnesium	7439-95-4	NA	NA	NA	NA	EN
Manganese	7439-96-5	NA	NA	NA	8.76E+01	8.76E+01
Mercury	7439-97-6	1.20E-02	NA	2.00E+00	1.10E+00 (g)	1.20E-02
Methylene chloride	75-09-2	5.00E+00	4.60E+00	5.00E+00	4.28E+00	5.00E+00
Naphthalene	91-20-3	NA	NA	NA	6.20E-01	6.20E-01
Nickel	7440-02-0	6.10E+02	6.10E+02	NA	7.30E+01	6.10E+02
Potassium	7440-09-7	NA	NA	NA	NA	EN
Sodium	7440-23-5	NA	NA	NA	NA	EN
Vanadium	7440-62-2	NA	NA	NA	3.65E+00	3.65E+00
Zinc	7440-66-6	9.10E+03	7.40E+03	NA	1.09E+03	9.10E+03

Notes:
AWQC - Ambient Water Quality Criteria.
CAS - Chemical Abstracts Service.
EN - Essential nutrient.
MCL - Maximum Contaminant Level.
NA - Not Available.
PRG - Preliminary Remediation Goal.
(a) OAC. 3745-1-34. Water Quality Criteria for the Ohio River Drainage Basin. Drinking water values.
(b) USEPA. 2006. National Recommended Water Quality Criteria. Ambient Water Quality Criteria (AWQC) for human heatlh consumption of water and organism.
(c) USEPA, 2004. 2004 Edition of the Drinking Water Standards and Health Advisories. Office of Water. EPA 822-R-02-038. Maximum Contaminant Levels (MCL). Winter 2004.
(d) USEPA, 2004. Region 9 Preliminary Remediation Goal (PRG) Table. October 2004. Value for Tap Water. PRGs based on noncarcinogenic effects were adjusted for a hazard quotient of 0.1 to account for cumulative effects.
(e) Selected based on hierarchy: (a), (b), Lower of (c),(d).
(f) PRG for hexavalent chromium.
(g) PRG for inorganic mercury.

Appendix C

ENSR | AECOM

Appendix C
Lead Modeling

LEAD MODELING

Because of the uncertainties in the dose-response relationship between exposure to lead and biological effects, it is unclear whether the noncarcinogenic effects of lead exhibit a threshold response. Therefore, an RfD for lead is not available. Although USEPA has classified lead as a B2 (probable human) carcinogen, no cancer slope factor (CSF) has been developed. Therefore, potential exposures to lead cannot be evaluated using the traditional methods of risk assessment. This appendix presents details on the three models used to evaluate lead. Lead was identified as a chemical of potential concern (COPC) in soil and in one groundwater well (MW-21S in AOC 13). The USEPA Integrated Exposure Uptake Biokinetic (IEUBK) Model was used to assess exposure to lead in soil and groundwater for the residential scenario. To evaluate soil lead exposure for nonresidential scenarios, the Adult Lead Model (ALM) was used (USEPA, 1996, spreadsheet version date 5/19/03),and to evaluate groundwater lead exposures for the nonresidential scenario, the Bowers model was used (Bowers, 1994).

Adult Lead Model

The ALM assumes that there is a baseline blood lead level in the adult population of the United States. It is assumed that there is a relationship between uptake of lead into the body and blood lead levels. The biokinetic slop factor (BKSF) was assigned to represent the relationship between uptake of lead into the body and blood levels. The model predicts the geometric mean blood lead level of adult workers potentially exposed to soil at the site, and also predicts the 95th percentile blood lead concentrations among fetuses of adult workers. The model was developed using a sensitive adult receptor, which is a woman of childbearing age. The target blood lead level of concern is 10 ug/dL.

The following equation was used to predict the average expected blood lead level for a hypothetical future worker:

$$PbB_{adult} = \frac{PbS \times BKSF \times IR_{S,D} \times AF_{S,D} \times EF_{S,D}}{AT_{S,D}} + PbB_0$$

The 95th percentile blood lead concentration among fetuses of adult workers is then predicted by:

$$PbB_{fetal,0.95} = PbB_{adult} \times \left(GSD_i^{1.645} \times R\right)$$

where:

PbB_{adult}	=	Geometric mean of adult blood lead concentration (ug/dL)
PbS	=	Soil lead concentration (mg/kg) *
BKSF	=	Biokinetic Slope Factor [(ug/dL) per (ug/day)]
IR_{SD}	=	Soil ingestion rate (including soil-derived indoor dust) (g/day) *
$AF_{S,D}$	=	Absorption fraction (same for soil and dust) (dimensionless)
$EF_{S,D}$	=	Exposure frequency (same for soil and dust) (days/year)*
$AT_{S,D}$	=	Averaging time (same for soil and dust) (days/year)*
PbB_0	=	Baseline blood lead concentration (ug/dL)
$PbB_{fetal,0.95}$	=	95th percentile blood lead concentration among fetuses of adult

workers (ug/dL)

R = Fetal/maternal blood lead ratio (dimensionless)

GSD_i = Geometric standard deviation of blood lead concentration (dimensionless)

Parameters marked with an (*) are discussed in Section 5 of the main text. Other parameters are further discussed below.

The Technical Review Workgroup (TRW), convened by USEPA to evaluate the risk assessment of lead, assumes that there is a baseline blood lead concentration in the adult population of the United States. The TRW selected baseline blood lead concentration represents the best estimate of a reasonable central tendency value for women of child-bearing age without previous excessive occupational exposures (USEPA, 1996). The TRW has developed potential baseline blood lead levels which are dependent on race. The recommended range is 1.7- 2.2 ug/dL. The version of the adult lead model spreadsheet dated 5/19/03 uses default values of 1.5 ug/dL for homogeneous populations and 1.7 ug/dL for heterogeneous populations; these values were used in this risk assessment.

The TRW recommended BKSF of 0.4 ug lead/dL blood per ug lead absorbed/day (USEPA, 1996) is utilized in this risk assessment. The absorption fraction (AF) is the fraction of lead in soil ingested daily that is absorbed from the gastrointestinal tract. The TRW (USEPA, 1996) recommended value of 0.12 for absorption from soil has been employed in this risk assessment.

The Fetal/Maternal blood lead concentration ratio (R) is 0.9, and is the recommended value of the TRW (USEPA, 1996d).

The TRW (USEPA, 1996d) recommends values for the individual blood lead concentration geometric standard deviation (GSD_i) ranging from 1.8 to 2.3. However, the spreadsheet version dated 5/19/03 uses default values of 2.1 for homogeneous populations and 2.3 for heterogeneous populations; these values were used in this risk assessment.

The results of the ALM for the future on-site worker and future construction worker are presented in Section 6 of main text of this report. Predicted blood lead levels are below 10 ug/dL for all areas and receptors with the exception of the future construction worker in AOC 1.

Bowers Model

Lead is identified as a COPC in groundwater in AOC 13 (MW-21S). The USEPA Adult Lead Model (1996d) does not evaluate potential exposures to lead in water. However, a model for evaluating adult exposure to elevated levels of lead in multiple environmental media (air, soil, and water) is available from peer reviewed literature (Bowers et al., 1994). The model of Bowers et al., (1994) is based upon a biokinetic slope factor approach conceptually similar to that upon which the USEPA (1996d) model is based. Therefore, the Bowers Model (Bowers et al., 1994) is used to evaluate potential exposures to lead in groundwater.

The adult lead exposure model of Bowers et al. (1994) also assumes that there is a baseline blood lead level in the adult population of the United States. It is assumed that the baseline blood lead level reflects typical exposure arising primarily due to lead in the diet. The model also incorporates ingestion and absorption rates specific to each potential exposure pathway. It is assumed that there is a relationship between uptake of lead into the body and blood lead levels. The BKSF represents the relationship between uptake of lead into the body and blood levels.

The following equation was used to predict the average expected blood lead level for a future on-site worker:

$$PbB(ug/dl) =$$

$$PbB_{baseline}(ug/dl) + BKSF\frac{(ug/dl)}{ug/day} * [Uptake_{air}(ug/day) + Uptake_{soil}(ug/day) + Uptake_{water}(ug/day)]$$

BKSF and $PbB_{baseline}$ were discussed under the adult lead model. The equations used to calculate uptake from air, soil and water are presented below:

- $$Uptake_{air}(ug/day) = \frac{AF_a(unitless) * IR_a(m^3/day) * C_a(ug/m^3) * EF(days)}{AT(days)}$$
- $$Uptake_{soil}(ug/day) = \frac{AF_s(unitless) * IR_s(g/day) * C_s(ug/g) * EF(days)}{AT(days)}$$
- $$Uptake_{water}(ug/day) = \frac{AF_w(unitless) * IR_w(L/day) * C_w(ug/L) * EF(days)}{AT(days)}$$

Where:

AF_a = Air Absorption Factor (unitless)

AF_s = Soil Absorption Factor (unitless)

AF_w = Water Absorption Factor (unitless)

IR_a = Air Inhalation Rate (m^3/day)

IR_s = Soil Ingestion Rate (g/day)

IR_w = Water Ingestion Rate (L/day)

C_a = Air Concentration (ug/m^3)

C_s = Soil Concentration (ug/day)

C_w = Water Concentration (ug/L)

EF = Exposure Frequency (days/year

AT = Averaging Time (days per year) (same as Exposure Frequency)

Ingestion rates, exposure frequencies, and media concentrations were discussed in Section 5 of the main text of this report. Absorption factors were discussed in under the adult lead model section of this appendix.

USEPA IEUBK Model

It is generally believed that increasing blood lead concentrations in children correlate with adverse neurological effects. The IEUBK model is a computer program that links typical risk assessment exposure analysis with a biokinetic model of lead uptake and distribution in the body to enable estimates of blood lead levels that may occur due to overall exposures to lead in the environment. The IEUBK model predicts blood lead levels in children 0-7 years of age due to exposure to lead from multiple sources, including air, water, diet, soil, and maternal sources, and considers differing exposure patterns and physiological changes in the various age groups. Children 0-7 years of age are considered by USEPA to be sensitive receptors for lead exposure because, compared to older receptors, young children ingest more soil, absorb more lead from the gastrointestinal tract, and are more sensitive to the effects of lead in the bloodstream. The health effects of most concern from lead exposures are impaired mental and physical development in young children.

Potential risk associated with incidental exposure of a young child (0-7 years of age) to lead as a result of non-potable groundwater use was evaluated using USEPA's IEUBK model (IEUBKwin32 Model 1.0 Build 261, June 2004).

Key assumptions in the IEUBK model are briefly discussed below:

Lead In Air: The model assumes a background concentration of lead in outdoor air of 0.1 ug/m^3 lead (based on the average lead concentration in outdoor air in urban areas in 1990) and in indoor air was assumed to be 30 percent of that for outdoor air or 0.03 ug/m^3. Age-specific air inhalation rates ranging from 2 to 7 m^3/day are used to estimate intake of lead via inhalation, and fractional uptake of inhaled lead was assumed to be 0.32.

Lead in the Diet: The model assumes an average ingestion of lead in diet that on an age-specific basis ranges from 0.006 to 0.007 mg lead/day. These values are based on Food and Drug Administration (FDA) reported dietary lead intake for U.S. children (6 months to 6 years of age) from 1987 to 1994. Fractional uptake of lead ingested in the diet was assumed to be 0.50.

Lead in Drinking Water: The model assumes a background concentration of lead in drinking water of 4 ug/l. Age-specific drinking water ingestion rates ranging from 0.20 to 0.59 L/day for U.S. children ages 6 months to 7 years were used to estimate lead intake and fractional uptake of lead ingested in water was assumed to be 0.50. A site-specific groundwater concentration was used for AOC 13, MW-21S.

Lead in Outdoor Soil and Indoor Dust: Age-specific average outdoor soil plus indoor dust ingestion rates ranging from 85 to 135 mg/day are used by the model and it is assumed that 45 percent of total ingestion is from soil and 55 percent is from dust. The site-specific exposure point concentration (EPC) for each area was used to represent outdoor soil concentrations. The source of lead in indoor dust is assumed to be lead in outdoor soil, and the concentration of lead in indoor dust is assumed to be 0.7 of that in outdoor soil, based on measured soil-dust relationships at other sites where soil was a major contributor to indoor dust. The fractional uptake of lead from soil and dust was assumed to be 0.30.

The IEUBK model calculates a distribution of blood lead concentration in children, both graphically and in table format. The model results are presented below for AOC 1, AOC 19, Southern Parcel, and AOC 13 (MW-21S). A brief discussion of the results follows each graph.

==========

Model Version: 1.0 Build 261
User Name: ENSR
Date: 8/17/2006
Site Name: AK STEEL FORMER ARMCO HAMILTON PLANT
Operable Unit: AOC 1
Run Mode: Site Risk Assessment

# Soil/Dust Data
EPC = 544 mg/kg

==========

The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550

5-6 0.580
6-7 0.590
Drinking Water Concentration: 4.000 ug Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 390.800 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	544.000	390.800
1-2	544.000	390.800
2-3	544.000	390.800
3-4	544.000	390.800
4-5	544.000	390.800
5-6	544.000	390.800
6-7	544.000	390.800

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

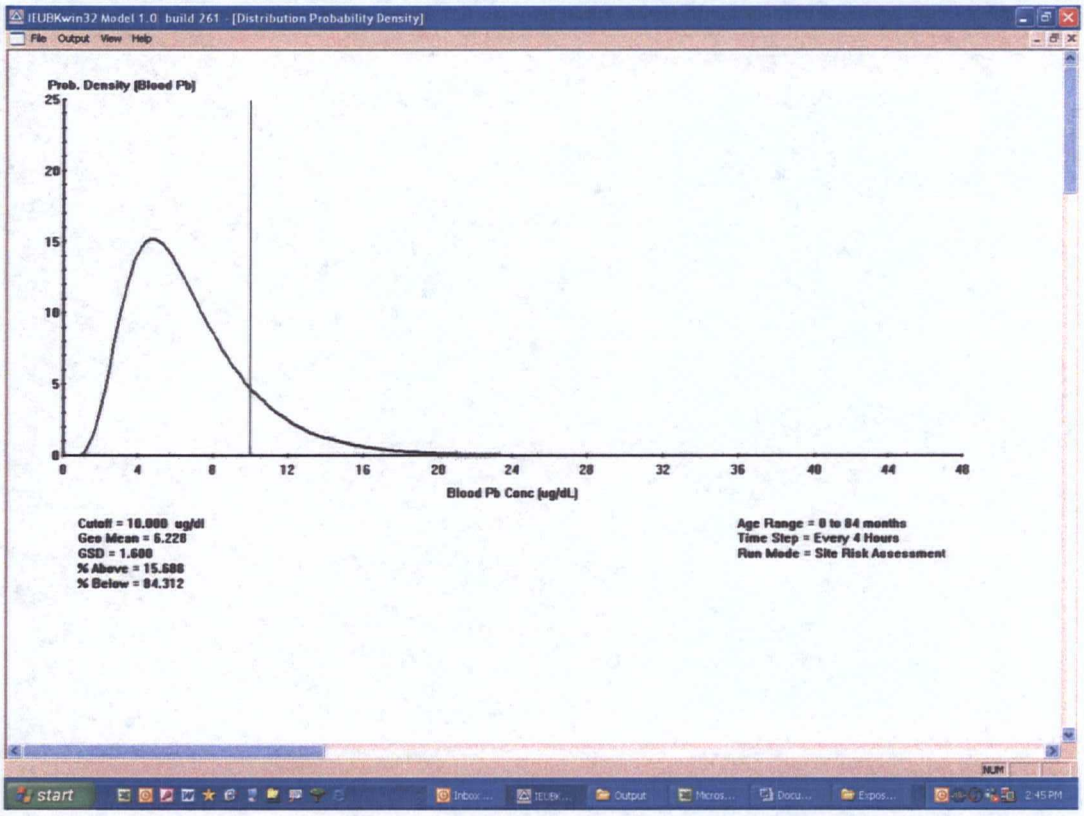
Maternal Blood Concentration: 2.500 ug Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.383	0.000	0.345
1-2	0.034	2.438	0.000	0.844
2-3	0.062	2.794	0.000	0.896
3-4	0.067	2.741	0.000	0.931
4-5	0.067	2.745	0.000	1.005
5-6	0.093	2.938	0.000	1.075
6-7	0.093	3.268	0.000	1.102

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	10.104	12.853	6.9
1-2	15.709	19.025	7.8
2-3	16.033	19.785	7.3
3-4	16.361	20.100	7.0
4-5	12.600	16.416	5.8
5-6	11.505	15.612	4.9
6-7	10.945	15.408	4.4

AOC 1 Graph:



AOC 1 Conclusions:

The predicted blood lead levels all age groups are below 10 ug/dl. As can be seen in the probability distribution above, 16% of young children potentially exposed to lead under the condition summarized above are predicted to exhibit blood lead concentrations greater than the acceptable blood lead level of 10 ug/dl and 84%, have blood lead levels less than 10 ug/dl. The USEPA regulatory target is at least 95% of young children in a population potentially exposed to lead having blood lead levels below 10 ug/dl. Therefore, under the conditions described above lead presents a potentially unacceptable risk for residential children at AOC 1.

Model Version: 1.0 Build 261
User Name: ENSR
Date: 8/17/2006
Site Name: AK STEEL FORMER ARMCO HAMILTON PLANT
Operable Unit: AOC 19
Run Mode: Site Risk Assessment

# Soil/Dust Data
EPC = 199 mg/kg

The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550

5-6 0.580
6-7 0.590
Drinking Water Concentration: 4.000 ug Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 149.300 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	199.000	149.300
1-2	199.000	149.300
2-3	199.000	149.300
3-4	199.000	149.300
4-5	199.000	149.300
5-6	199.000	149.300
6-7	199.000	149.300

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

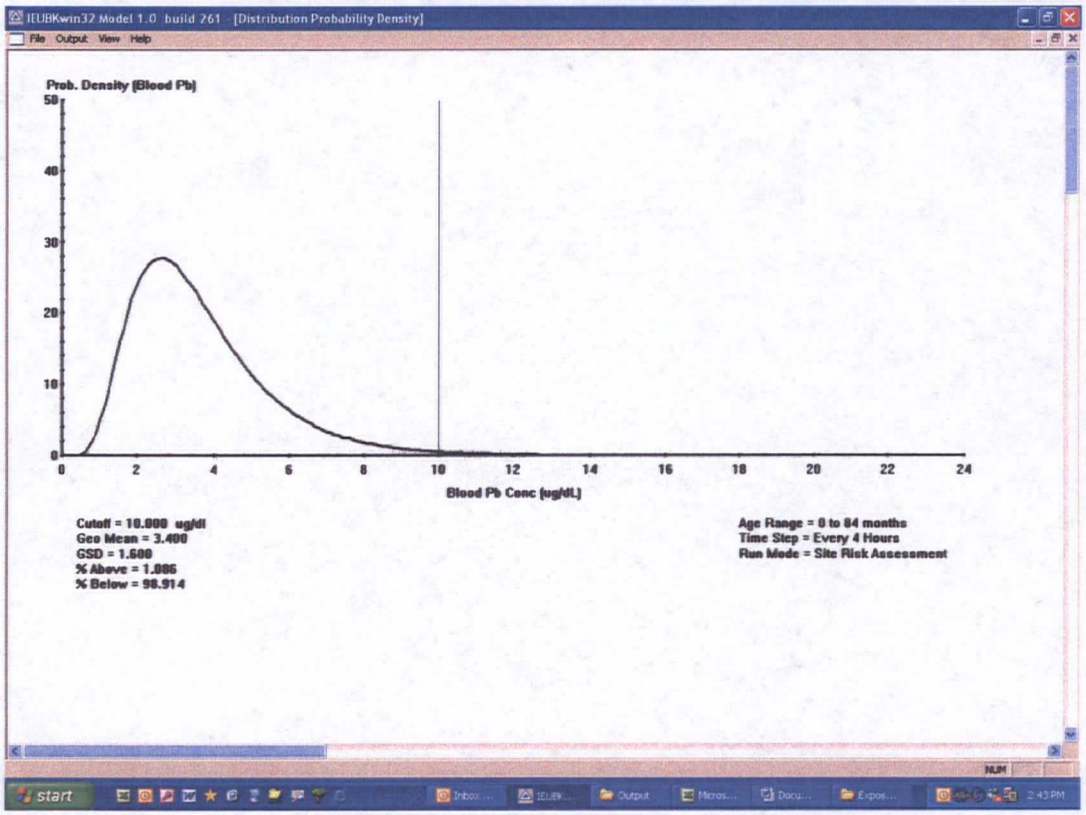
Maternal Blood Concentration: 2.500 ug Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.553	0.000	0.369
1-2	0.034	2.648	0.000	0.916
2-3	0.062	3.002	0.000	0.962
3-4	0.067	2.920	0.000	0.992
4-5	0.067	2.863	0.000	1.048
5-6	0.093	3.040	0.000	1.113
6-7	0.093	3.367	0.000	1.135

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	4.042	6.986	3.8
1-2	6.370	9.968	4.1
2-3	6.433	10.459	3.9
3-4	6.506	10.484	3.7
4-5	4.907	8.885	3.1
5-6	4.445	8.692	2.7
6-7	4.211	8.806	2.5

AOC 19 Graph



AOC 19 Conclusions:

The predicted blood lead levels all age groups are below 10 ug/dl. As can be seen in the probability distribution above, 1% of young children potentially exposed to lead under the condition summarized above are predicted to exhibit blood lead concentrations greater than the acceptable blood lead level of 10 ug/dl and 99% have blood lead levels less than 10 ug/dl. The USEPA regulatory target is at least 95% of young children in a population potentially exposed to lead having blood lead levels below 10 ug/dl. Therefore, under the conditions described above lead does not presents a potentially unacceptable risk for residential children at AOC 19.

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Model Version: 1.0 Build 261
User Name: ENSR
Date: 8/17/2006
Site Name: AK STEEL FORMER ARMCO HAMILTON PLANT
Operable Unit: Southern Parcel
Run Mode: Site Risk Assessment

# Soil/Dust Data
EPC = 164 mg/kg (based on 2006 data; EPC based on 2006 and 2008 data is 133; model was not re-run with lower EPC)

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The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530

4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 ug Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 124.800 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	164.000	124.800
1-2	164.000	124.800
2-3	164.000	124.800
3-4	164.000	124.800
4-5	164.000	124.800
5-6	164.000	124.800
6-7	164.000	124.800

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 2.500 ug Pb/dL

****

CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.572	0.000	0.372
1-2	0.034	2.672	0.000	0.924
2-3	0.062	3.026	0.000	0.970
3-4	0.067	2.939	0.000	0.999
4-5	0.067	2.876	0.000	1.053
5-6	0.093	3.051	0.000	1.117
6-7	0.093	3.377	0.000	1.139