

Coal Ash Industrial Byproduct Characterization

Water Leach Test (ASTM D3987-12)	Category 1	Category 2
Parameter	mg/L	mg/L
Antimony	0.006	0.03
Arsenic	0.01	0.05
Barium	2	10
Beryllium	0.004	0.02
Boron	1	5
Cadmium	0.005	0.025
Chloride	1250	2500
Chromium, Tot.	0.1	0.5
Cobalt	0.04	0.2
Fluoride	4	20
Lead	0.015	0.075
Mercury	0.002	0.01
Molybdenum	0.04	0.2
Selenium	0.05	0.25
Sulfate	1250	2500
Thallium	0.002	0.01

Totals Analyses	Category 1
Parameter	mg/kg
Antimony	93.4
Arsenic	8
Barium	43700
Beryllium	459
Boron	46600
Cadmium	197
Chromium, Hex.	6.36
Lead	52
Mercury	13.2
Molybdenum	1170
Selenium	1170
Thallium	2.34
Vanadium	1170

Foundry System Sand Industrial Byproduct Characterization

Water Leach Test (ASTM D3987-12)	Category 1	Category 2
Parameter	mg/L	mg/L
Antimony	0.006	0.03
Arsenic	0.01	0.05
Beryllium	0.004	0.02
Cadmium	0.005	0.025
Chromium, Tot.	0.1	0.5
Cobalt	0.04	0.2
Copper	1.3	6.5
Iron	1.5	3.0
Lead	0.015	0.075
Manganese	0.3	1.5
Nickel	0.1	0.5

Totals Analyses	Category 1
Parameter	mg/kg
Antimony	93.4
Arsenic	8
Beryllium	459
Cadmium	197
Chromium, Hex.	6.36
Lead	52
Nickel	4500
Acenaphthene	9040
Anthracene	45200
Benz(a)anthracene	2.88
Benzo(a)pyrene	0.29
Benzo(b)fluoranthene	2.89
Benzo(k)fluoranthene	28.9
Chrysene	289
Dibenzo(ah)anthracene	0.29
Flouranthene	6030
Flourene	6030
Indeno(123-cd)pyrene	2.89
1-methyl naphthalene	72.7
2-methylnaphthalene	603
Naphthalene	24.1
Pyrene	4520

Ferrous and Steel Slag Industrial Byproduct Characterization

Water Leach Test (ASTM D3987-12)	Category 1	Category 2
Parameter	mg/L	mg/L
Antimony	0.006	0.03
Arsenic	0.01	0.05
Barium	2	10
Beryllium	0.004	0.02
Boron	1	5
Cadmium	0.005	0.025
Chromium, Tot.	0.1	0.5
Fluoride	4	20
Iron	1.5	3.0
Lead	0.015	0.075
Molybdenum	0.04	0.2
Thallium	0.002	0.01
Vanadium	0.03	0.15

Totals Analyses	Category 1
Parameter	mg/kg
Antimony	93.4
Arsenic	8
Barium	43700
Boron	46600
Cadmium	197
Chromium, Hex.	6.36
Lead	52
Manganese	5180
Molybdenum	1170
Thallium	2.34
Vanadium	1170

FGD Byproduct Industrial Byproduct Characterization

Water Leach Test ¹ (ASTM D3987-12)	Category 1	Category 2
Parameter	mg/L	mg/L
Antimony	0.006	0.03
Arsenic	0.01	0.05
Boron	1	5
Fluoride	4	20
Manganese	0.30	1.5
Mercury	0.002	0.01
Selenium	0.05	0.25
Sulfate	1250	2500
Thallium	0.002	0.01

Totals Analyses ¹	Category 1
Parameter	mg/kg
Antimony	93.4
Arsenic	8
Beryllium	459
Chromium (Cr VI)	6.36
Mercury	13.2
Selenium	1170
Thallium	2.34

1 – Parameters for all other beneficial uses excluding use as a soil or plant additive.

FGD Byproduct Industrial Byproduct Characterization

Soil or Plant Additive

Totals Analyses	
Parameter	mg/kg
Antimony	1.5
Arsenic	13.1
Barium	1000
Beryllium	2.5
Boron	200
Cadmium	1.0
Chromium (Total)	100
Copper	95
Lead	30
Manganese	1500
Mercury	2.5
Molybdenum	10
Nickel	100
Selenium	50
Thallium	1.0
Vanadium	136
Zinc	125

Note: Values are derived from the NRCS Conservation Practice Standard Code 333, June, 2015

Other Industrial Byproduct Characterization

Water Leach Test (ASTM D3987-12)	Category 1	Category 2
Parameter	mg/L	mg/L
Aluminum	0.2	1
Antimony	0.006	0.03
Arsenic	0.01	0.05
Beryllium	0.004	0.02
Barium	2	10
Boron	1.0	5.0
Cadmium	0.005	0.025
Chloride	1250	2500
Chromium, Tot.	0.1	0.5
Cobalt	0.04	0.2
Copper	1.3	6.5
Fluoride	4.0	20
Iron	1.5	3.0
Lead	0.015	0.075
Manganese	0.3	1.5
Mercury	0.002	0.01
Molybdenum	0.04	0.2
Nickel	0.1	0.5
Nitrite + Nitrate (as N)	10	50
Phenol	2.0	10
Selenium	0.05	0.25
Sulfate	1250	2500
Thallium	0.002	0.01
Vanadium	0.03	0.15
Zinc	25	50

Other Industrial Byproduct Characterization

Totals Analyses	Category 1
Parameter	mg/kg
Aluminum	226000
Antimony	93.4
Arsenic	8
Barium	43700
Beryllium	459
Boron	46600
Cadmium	197
Chromium, Hex.	6.36
Cobalt	69.5
Copper	9340
Lead	52
Manganese	5180
Mercury	13.2
Molybdenum	1170
Nickel	4500
Selenium	1170
Silver	1170
Strontium	140000
Thallium	2.34
Vanadium	1170
Zinc	70100
Acenaphthene	9040
Anthracene	45200
Benz(a)anthracene	2.88
Benzo(a)pyrene	0.29
Benzo(b)fluoranthene	2.89
Benzo(k)fluoranthene	28.9
Chrysene	289
Dibenzo(ah)anthracene	0.29
Flouranthene	6030
Flourene	6030
Indeno(123-cd)pyrene	2.89
1-methyl naphthalene	72.7
2-methylnaphthalene	603
Naphthalene	24.1
Pyrene	4520

Beneficial Use Methods		Industrial Byproduct Category		
		3	2	1
NR 538.10		3	2	1
(1)	Encapsulated Uses	x	x	x
(2)	Waste Stabilization / Solidification	x	x	x
(3)	Supplemental Fuel Source / Energy Recovery	x	x	x
(4)	Landfill Daily Cover / Internal Structures at landfills having a leachate collection system	x	x	x
(5)	Confined Geotechnical Fill (a) commercial, industrial or institutional building subbase (b) paved lot base, subbase & subgrade fill (c) paved roadway base, subbase & subgrade fill (d) utility trench backfill (e) bridge abutment backfill (f) tank, vault or tunnel abandonment (g) slabjacking material (h) soil and pavement base stabilization for structural improvements listed in (5)(a) - (c) (i) controlled low strength material (flowable fill) for structural improvements listed in (5)(a), (d), (e) and (f)		x	x
(6)	Soil or Plant Additive ¹		x	x
(7)	Capped Transportation Facility Embankment			x
(8)	Unconfined Geotechnical Fill			x
(9)	Nonmetallic Mine Reclamation			x
(10)	Unbonded Surface Course			x
(11)	Bonded Surface Course			x
(12)	Decorative Stone			x
(13)	Cold Weather Abrasive			x
(14)	Blasting Grit/Abrasive			x

1 – Applies only to use of flue gas desulfurization (FGD) byproduct as a soil or plant additive.