

Flue Gas Desulfurization (FGD) Wastewater Characterization and Management: 2007 Update

1014073

Final Report, March 2008

Table 3-5
Sulfate Levels and SS Across the Treatment Plant

Location	Parameter	Unit	Value
Primary Clarifier	Sulfate	mg/L	1
			2
			3
			4
			5
			6
			7
			8
			9
			10
Secondary Clarifier	Sulfate	mg/L	1
			2
			3
			4
			5
			6
			7
			8
			9
			10
Tertiary Clarifier	Sulfate	mg/L	1
			2
			3
			4
			5
			6
			7
			8
			9
			10

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Aluminum and barium increase in concentration across the wastewater treatment plant at Site BLSFO2. Site BLSFO2 adds lime for desaturation which causes an increase in pH. Aluminum is more soluble at a higher pH. Also, lime can be added to lower the sulfate concentration. As the sulfate concentration decreases barium becomes more soluble and some of the particulate barium becomes soluble. This is a possible explanation for the increase in aluminum and barium at Site BLSFO2.

Aluminum and barium decreased at Site U which does not add lime. Site L2 does not add lime but aluminum increased across the treatment plant. The increase in aluminum at Site L2 is therefore more difficult to explain. Because only one grab sample was collected, there is the possibility that the effluent samples do not correspond with the exact sample at the influent. Composite and long-term sampling would help show if there is a consistent increase in aluminum across the wastewater treatment plant.

**Table 3-3
Soluble Metals and TSS Across the Treatment Plant**

Site Information	Dissolved Metal (µg/L)	FGD WWTP Influent	FGD WWTP Effluent
Site BLSFO2 Primary Clarifier: Yes. Lime, ferric chloride, sodium sulfide. Secondary Clarifier: Yes. Ferric chloride, sodium sulfide. Filtration: Yes Biological: Yes	Al	3.5	300
	Sb	11	8
	As	120	140
	Ba	520	860
	Cd	15	1.5
	Cr	40	37
	Cu	64	17
	Pb	4.4	0.5
	Hg	0.38	0.88
	Ni	1,500	50
	Se	1,300	680
	Tl	40	23
	Zn	860	130
Mn	71,000	4,000	
Site BLSFO3 Primary Clarifier: Yes. Lime. Secondary Clarifier: Yes. Ferric chloride, polymer. Filtration: Yes Biological: Yes	As	300	270
	Hg	1.3	1
	Se	6,200	3,800

Table 3-3 (continued)
Soluble Metals and TSS Across the Treatment Plant

Site Information	Dissolved Metal (µg/L)	FGD WWTP Influent	FGD WWTP Effluent
Site 2B Primary Clarifier: Yes. Lime, polymer. Secondary Clarifier: Yes. Organo-sulfide, ferric chloride, polymer. Filtration: Yes Biological: Yes	Hg	12	1.7
	Ni	960	<200
	Se	10,000	9,300
	Tl	120	<100
	Zn	670	<200
Site L2 Primary Clarifier: Yes. Secondary Clarifier: Yes. Ferric chloride, polymer. Filtration: Yes Biological: Yes	Al	1,300	2,900
	Cd	290	220
	Hg	0.52*	0.27*
	Ni	3,100	2,500
	Se	1,400	740
	Tl	240	170
	Zn	6,200	4,800
Site U Primary Clarifier: Yes. Secondary Clarifier: No. Filtration: No Biological: No	Al	400	<200
	As	16	11
	Ba	210	150
	Cu	140	45
	Hg	3.3	0.13
	Ni	170	47
	Zn	53	<40
	Mn	5,400	870
Site L1 (w/DBA) Primary Clarifier: Yes. Polymer. Secondary Clarifier: No. Filtration: No. Biological: No.	Se	690	670
	Zn	220	<200

* Associated MS had recovery below target range. Was 67% recovery.

As discussed in the previous section, treatment removes the forms of mercury and selenium speciation differently. The soluble mercury concentration increased through treatment while the particulate mercury concentration decreased (Figure 3-17). Therefore it is likely that particulate mercury is agitated into small fines that pass through the sampler's 0.45-micron filter and therefore are considered dissolved. This is important because particulate mercury is more likely to settle out during treatment than the dissolved mercury.

