



STEEL MANUFACTURER, MICHIGAN

THE CHALLENGE

A steel manufacturer in the Midwest generates about 250,000 gallons per day (gpd) of wastewater with the characteristics shown in Table 1.

Coal is converted into coke in a coking process to drive off moisture and volatile matter. Coke is the source of both energy and carbon for reduction of iron oxides in the blast furnace. The coke oven gas, cooled with a weak ammonia liquor, passes through a series of towers and scrubbers where ammonia is stripped and removed. Effluent from the ammonia stripping operation is contaminated with ammonia, phenol, cyanide and mercury. Concentration of mercury in the effluent ranges from 15 to 45 µg/L. The facility is strictly required to meet a discharge limit of 5 µg/L for mercury.

Flow Rate	200 – 250 gpm
Temperature	160 – 200 ° F
pH	8.5 – 12
Mercury	18 – 45 µg/L
Ammonia	~ 40 mg/L
Phenol	~ 45 mg/L

THE SOLUTION

The AQUASIL® product was added directly to the waste stream. The treatment, which is independent of both temperature and pH proved very effective in removing mercury from the waste stream and consistently met discharge requirements. As well, a significant reduction in the concentrations of ammonia and phenol was obtained. Treatment conditions and results are shown in Table 2 below.

Test	Temperature, ° F	pH	Hg, µg/L
Raw water	ambient	12	36
1	194	8.4	4.0
2	194	3.0	1.8
3	194	12	1.7
3	ambient	8.4	< 0.50
4	ambient	3.0	1.7

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