

# MEASUREMENTS OF DISSOLVED OXYGEN IN ACTIVE AND PASSIVE TREATMENT SYSTEMS<sup>1</sup>

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**Abstract:** Oxygen transfer is an important objective in systems that treat iron-contaminated mine water. A variety of active and passive techniques exist that promote aeration and oxygen transfer. We measured dissolved oxygen (DO) in two systems that treat alkaline (pH 6.5, alkalinity 200-400 mg/L CaCO<sub>3</sub>) iron-contaminated (15-25 mg/L Fe) water with different aeration devices. The Wilson site contains a Maelstrom Oxidizer (MO) that aerates the inflow with an electrically-powered blower. The MO increased DO from 0.4 mg/L to 8.5 mg/L. Turbulent flow out of the MO and down a ditch to the settling pond increased DO by another 0.5 mg/L. When the blower was turned off, flow through the unit increased DO by 0.3 mg/L, while turbulent flow in the ditch increased DO by 3.0 mg/L. The Wingfield system contains a large pipe fountain that aerates water using 1.5 ft of natural head. The fountain increased DO from 0.4 mg/L to 3.3 mg/L. Shallow sheet flow into the pond increased the DO by another 2.8 mg/L. Both aeration systems transferred enough oxygen to satisfy the oxygen demand of ferrous iron oxidation. The poster will present the DO measurements and provide calculations of gas transfer rates and cost effectiveness of the two techniques.

**Additional Keywords:** coal mine drainage, oxygen transfer

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