Gilt Edge Mine NPL Site

Lawrence County, South Dakota

Lime High-Density Sludge Water Treatment Plant

February 2002 – September 2003

Gilt Edge Mine NPL Site
Lawrence County, SD
Lime-HDS Process WTP

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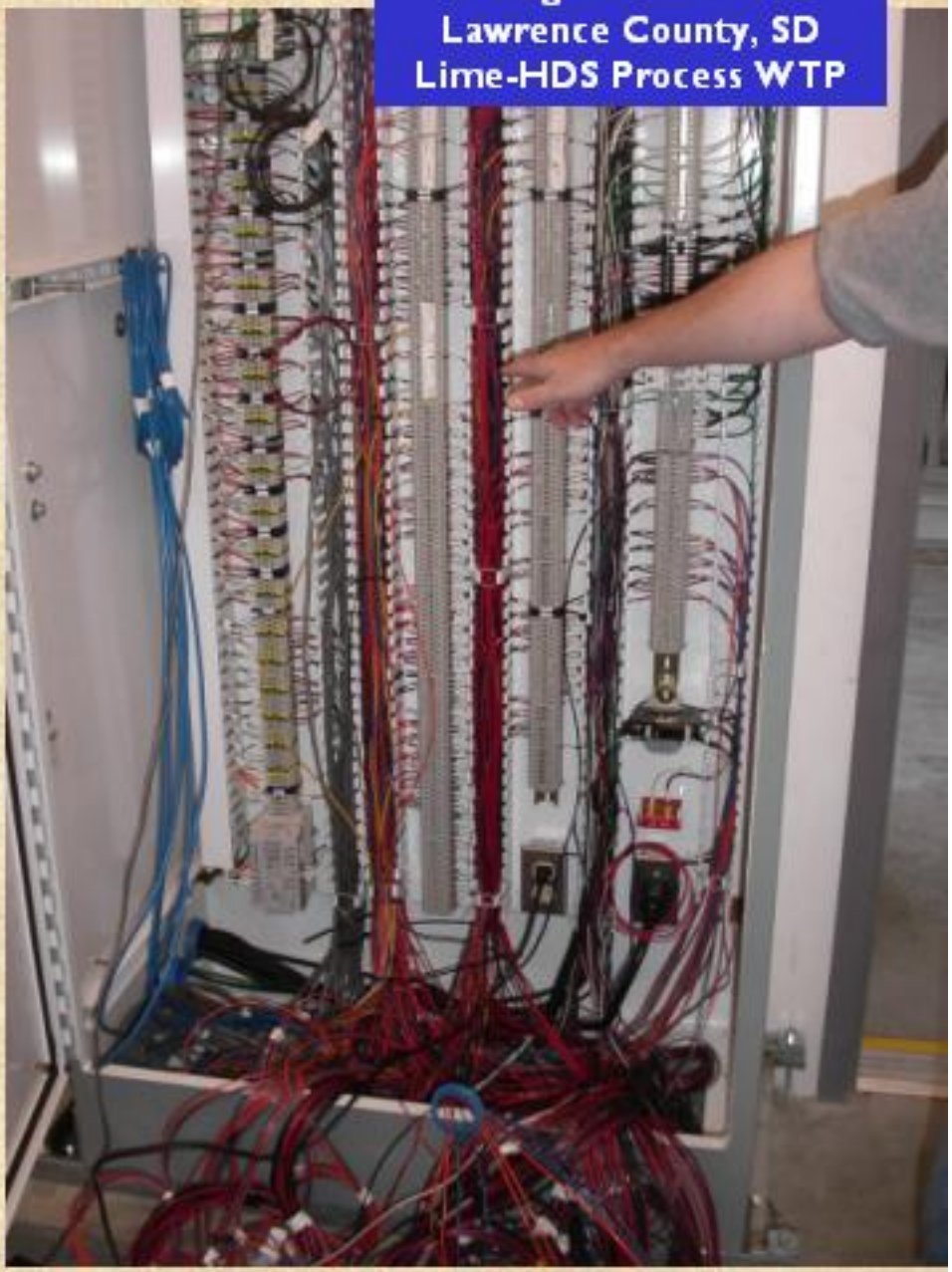

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Water Treatment Plant
Lime-based High-Density Sludge-Recycle Process

During mining operations, a sodium-hydroxide based water treatment plant (WTP) was built to treat acid-waters laden with toxic heavy-metals. That plant produced 2%-solids waste-sludge ("chocolate milk") with no filter-presses and was dumped onsite. Discharged water achieved standards only after mixing with clean Boomer Gulch flows near Bear Butte Creek. EPA studied options for less-costly and improved treatment and selected this new system. The lime-based WTP has been designed to meet standards at end-of-pipe. Chemical costs for the lime-based system are much cheaper, and the sludge will be 25+%-solids ("tooth-paste") consistency--allowing easier storage and possible future use as sub-soil.

- Up to 250 gallons-per-minute production (up to 11 million gallons-per-month, or 44 typical recreation-center swimming pools).
- Designed to provide interim and long-term site water treatment needs.
- Fully-enclosed plant: 44'x 98'x 25'- high building; 12'diameter x 48'-high silo
- Process components: ARD-inflow tank; 55-ton lime silo & slaker; lime-ARD mix tank; polymer system; 25'-diameter x 17'-high 37,000-gal. Thickener-clarifier with hydraulic-lift rake-drive; CO_2 injection system for effluent pH adjustment; granular multi-media pressure-filtration system for final effluent polishing.
- Programmable logic-controllers automate pumps, valves, and chemical processes; computer-software systems monitor and display operational data.
- Sludge is pipelined 1,600 feet to containment lagoon.
- Project cost: $3,172,000