Recent Innovations in Passive Treatment of Mine-Influenced Waters

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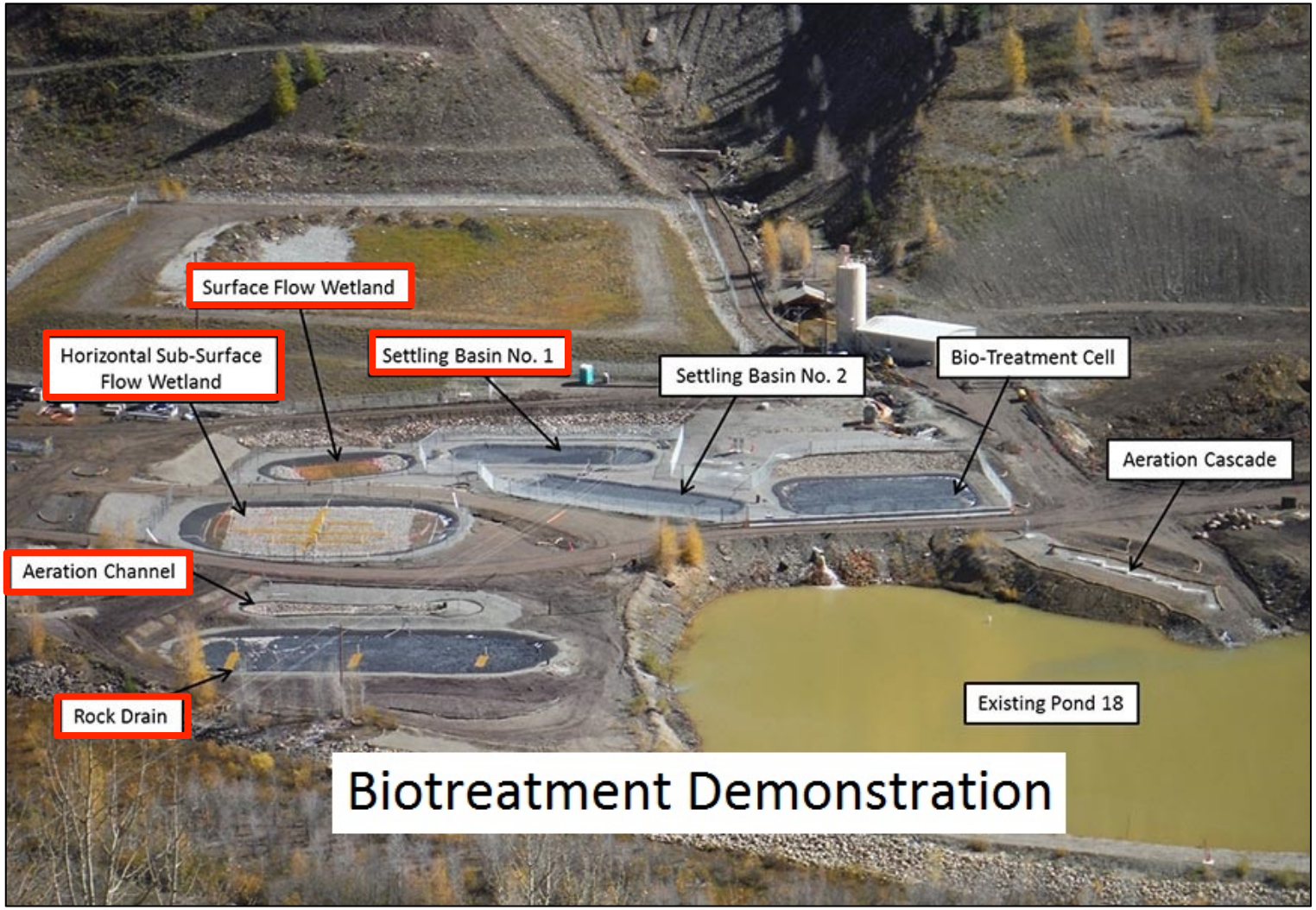
Treatment Wetland at Campbell Mine

Tulsequah Chief Treatment System underground construction

Tulsequah Chief Treatment System carbon addition

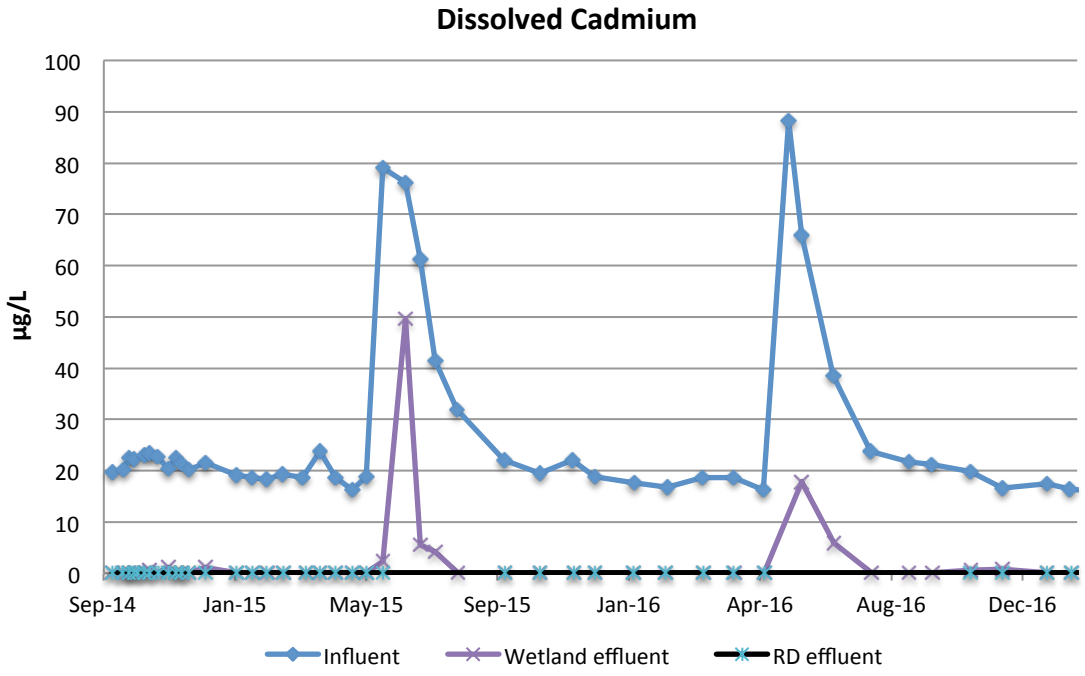
Tulsequah Chief Treatment System sludge accumulation

Rico-Argentine Passive Treatment System



Rico-Argentine Treatment System Cadmium

- Generally, influent cadmium was 20 µg/L, >80 µg/L during freshet
- Wetland effluent was < 0.5 µg/L except during freshet
- Rock drain effluent was < 0.5 µg/L year-round (adsorption onto manganese oxides)



Rico-Argentine Treatment System seasonal metal loads

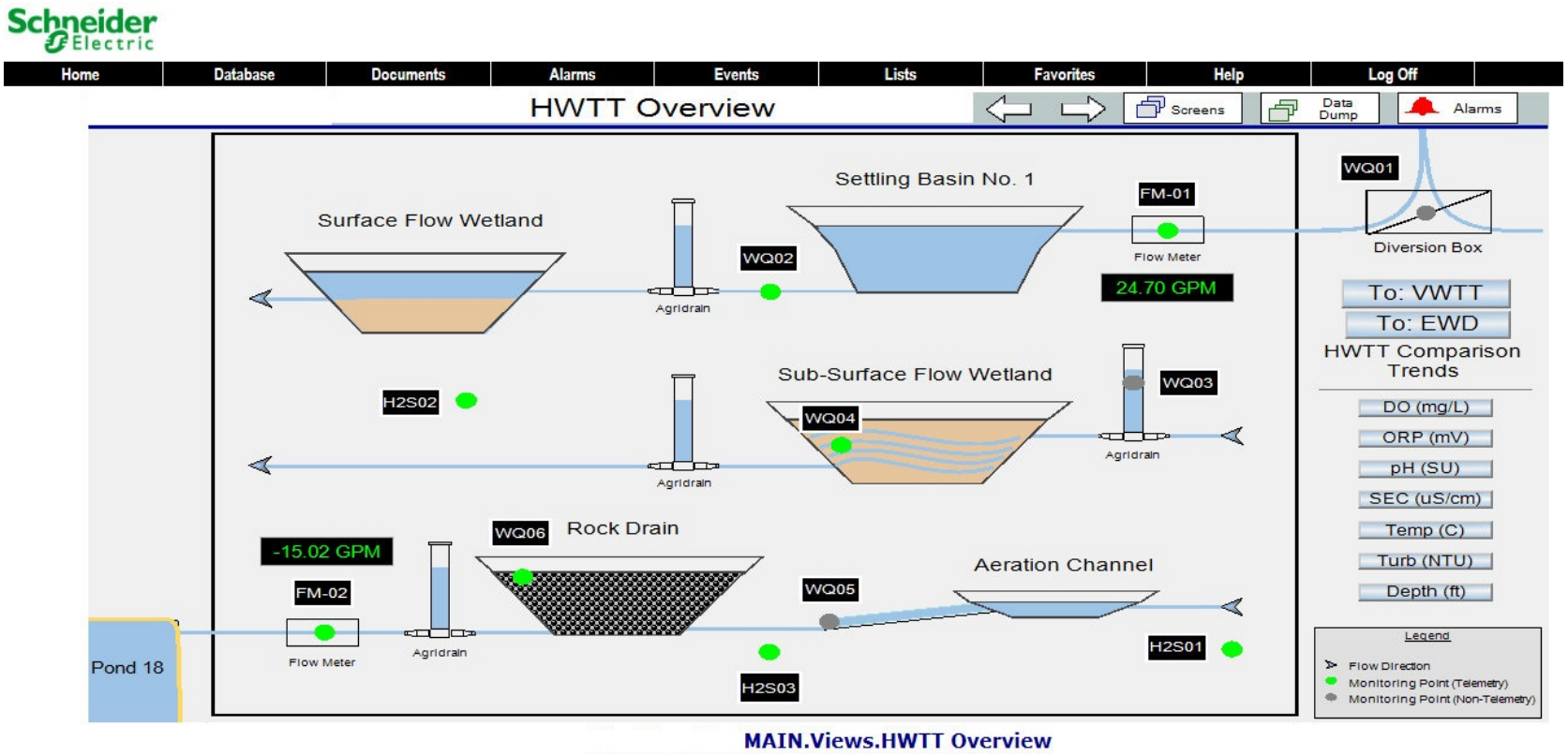
Metal load (kg/day)	Cd	Mn	Zn
Non-freshet	1.00	96.48	184.03
Sum freshet	0.51	29.91	83.84
Freshet/Annual	0.34	0.24	0.31

Waste Rock Piles at Blackbird Mine, Idaho

Photo by A. Maest

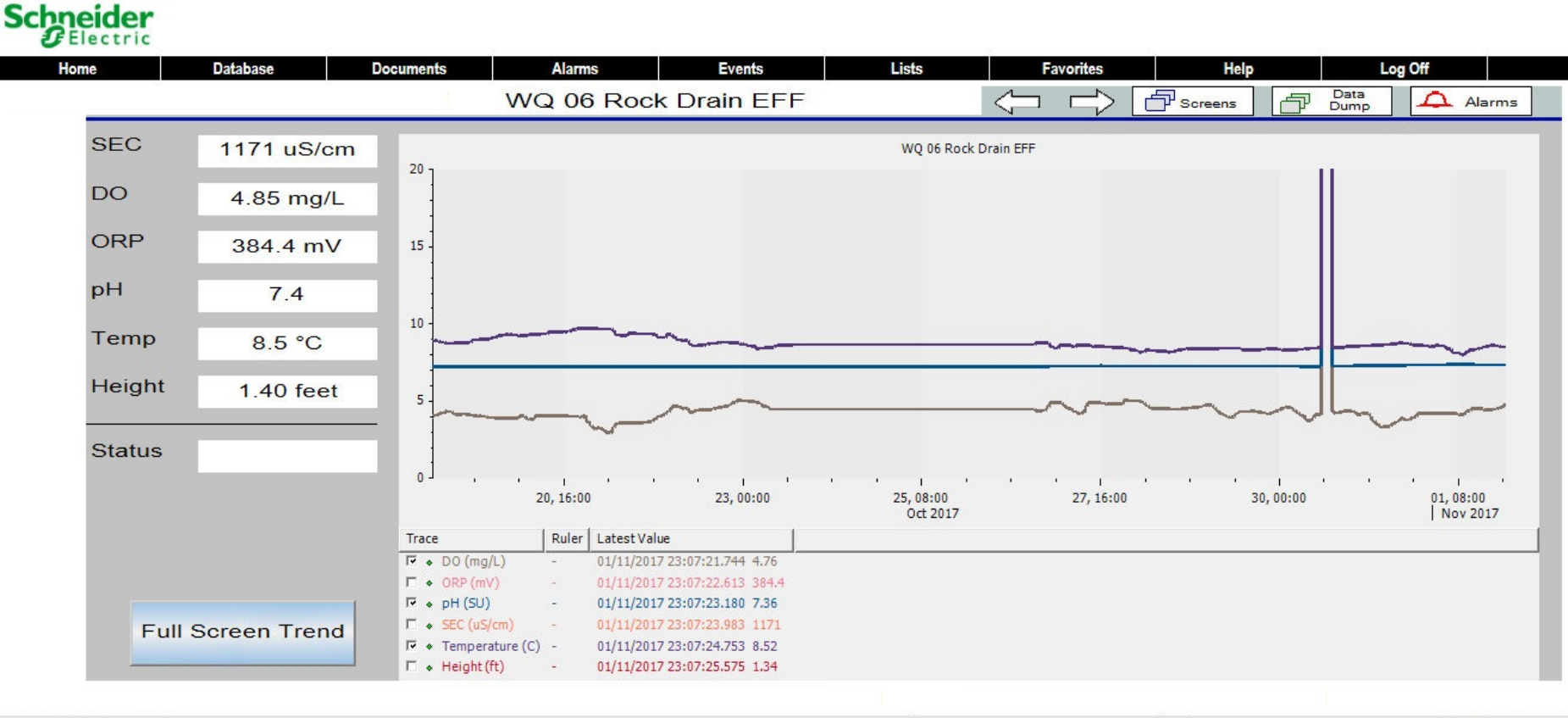
Rico-Argentine Treatment System - instrumentation

- Entire demo-scale system was instrumented, connected to remotely-accessible data logger and SCADA
- Water quality parameters are available anywhere in real time



Rico-Argentine Treatment System - instrumentation

- Example of screen providing status of rock drain parameters
- This enables remote monitoring, control of operation (raise or lower water elevation, adjust pH, add reagent, etc)



Rico-Argentine Passive Treatment System
Sonde Fouling

Flow Rates at MD800 adit, Bralorne Mine, BC