R9 Laboratory - Water Quality Monitoring Capabilities

Water Quality Sondes/Sensors

Acid Mine Drainage
pH , Temperature
Conductivity
Oxidation-Reduction Potential
Dissolved Oxygen
Depth
(9 Sondes)

Lake/River Studies
Temperature
Chlorophyll
Phycocyanin
Phycoerythyrn
Rhodanine Dye
Green Algae
Blue-Green Algae
Turbidity
Oil
Depth
(1 system)

NPDES
pH , Temperature
Conductivity
Dissolved Oxygen
Ammonia
Nitrate
Chloride
Turbidity
Depth
(1 system)

Automated Sampling

Multipurpose
ISCO Samplers – Grabs or Composites (triggered collection based on time, depth/flow, or sensor-based thresholds (e.g., pH, Specific Conductance)
3 systems

Storm Water
Global Water (peristaltic pump)
2 systems

D-TEC (Passive First Flush – 2 Systems

Remote Internet Access (30 minute to one-hour intervals 24/7)

Cellular Telemetry – *1 system*

Satellite Telemetry - *3 systems*

Test Site – Satellite Telemetry
Leviathan Mine Superfund Site
Alpine County – Sierra Nevada, California
Elevation 6000-7000 feet

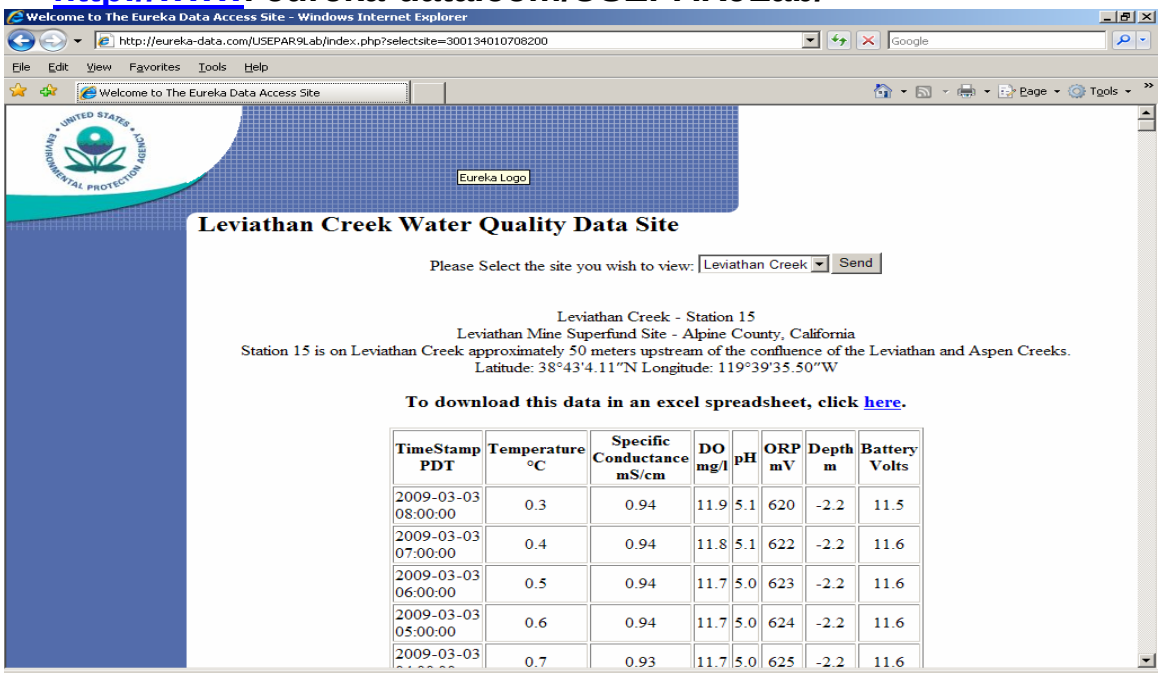
Acid Mine Drainage (AMD) emanates from a former copper sulfate mine as sulfuric acid and drains directly into Leviathan and Aspen Creeks. A satellite telemetry system provides project management a near real-time system to monitor two separate treatment systems and a compliance point. A sonde collects, and records water quality-monitoring data (pH, specific conductivity, ORP, DO, temperature, and depth), and a satellite modem transmits hourly to a third-party database provider that posts the data on the internet. The system works entirely off solar charged 12-volt battery power. Each location presents a unique set of challenges/concerns (satellite access, adequate sunlight, heavy snowfall, lightning strikes, flash floods, possible vandalism).

Aspen Creek

Leviathan Creek

Bryant Creek

http://www. eureka-data.com/USEPAR9Lab/



TimeStamp PDT	Temperature °C	Specific Conductance mS/cm	DO mg/l	pH	ORP mV	Depth m	Battery Volts
2009-03-03 08:00:00	0.3	0.94	11.9	5.1	620	-2.2	11.5
2009-03-03 07:00:00	0.4	0.94	11.8	5.1	622	-2.2	11.6
2009-03-03 06:00:00	0.5	0.94	11.7	5.0	623	-2.2	11.6
2009-03-03 05:00:00	0.6	0.94	11.7	5.0	624	-2.2	11.6
2009-03-03	0.7	0.93	11.7	5.0	625	-2.2	11.6

Presently, three satellite telemetry systems transmit data hourly, monitoring: 1.) Bioreactor-treated AMD in Aspen Creek, 2.) Lime-treated and un-treated (seasonal) AMD in Leviathan Creek, and 3.) Downstream compliance in Bryant Creek. Each site is accessible from a drop down menu on a public internet site (password protection available). Download data in an Excel® spreadsheet format.