

CUSTOMER CASE STUDY

The City of Boise's groundbreaking phosphorus removal facility removes 8,000 tons of wet solids from the Boise River every year, and it all operates on AVEVA™ System Platform

City of Boise – Dixie Drain
Industry - Water and wastewater

Goals

- Standardize technology platforms used by City of Boise Public Works to optimize efficiency, reusability, operator training, costs.
- Comply with environmental regulations requiring a 98% reduction in the amount of phosphorus leaving the City of Boise's water treatment facilities.
- Protect the environmental integrity of the Boise and Snake Rivers.

Challenges

- Having different proprietary technology at different sites was difficult to support without centralized monitoring and control.
- EPA guidelines would otherwise require expensive facility modifications to meet water treatment requirements.
- Roughly 80 percent of water leaving the existing water treatment facilities is used downstream to irrigate agricultural fields, where it picks up more phosphorus before it drains into the Snake River.

Solutions

- AVEVA System Platform
- AVEVA™ Historian

Results

- The City of Boise is efficiently removing 50% more phosphorus from the Snake River than it would have if taking a traditional approach to waste water treatment.
- Dixie Drain removes up to 140 pounds of phosphorus per day, roughly 10 tons of phosphorus per year, and about 8,000 tons of wet solids per year from the Boise River.
- For every pound of phosphorus not removed at a treatment facility in Boise, a pound and a half is removed downstream at Dixie Drain.
- For the same cost as upgrading facilities at the existing treatment plants, the new facility at Dixie Drain removes much more phosphorus from the Boise River, creating a lower cost per pound removed and a far greater environmental outcome.

A groundbreaking approach to water treatment in the city of Boise

Boise, Idaho - In 2016, the City of Boise commissioned a groundbreaking new phosphorus removal facility that will greatly reduce the amount of phosphorus entering the lower Boise and Snake rivers. Eight years in the making, the 49-acre Dixie Drain project, located between Notus and Parma, will greatly enhance water quality in the Boise and Snake rivers by removing up to 140 pounds of phosphorus per day, or roughly 10 tons each year. This innovative effort marked a first-of-its-kind collaboration between local, state and federal groups and agencies, and is held as a model for similar projects across the country.

“Essentially, Dixie Drain represents a new way of dealing with pollutant offset trading. For every pound of phosphorus not removed in the City of Boise, we actually remove a pound and a half of phosphorus at Dixie Drain.”

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Colin Hickman
Communications Manager, City of Boise Public Works

The Economic and environmental challenges faced by the City of Boise

Roughly 80 percent of water that leaves the city of Boise’s existing water treatment facilities is used downstream to irrigate agricultural fields, where it picks up more phosphorus before it drains into the Snake River. Meanwhile, federal regulations required the City of Boise to remove 98 percent of the phosphorus from the water leaving its treatment facilities.

With these new guidelines, the City of Boise determined that it would be very expensive to comply with the removal rates for waste water processing. Since modification to the City’s existing facilities would have been extraordinarily expensive and provided a diminished environmental return on investment, city engineers proposed building a new facility in the same watershed to remove more in volume than they were obligated to remove with typical sewage processing.

“The theory was, it was more efficient to build a new plant that can pull phosphorus from irrigation runoff. Being part of that project at one of the waste water plants in the city was a great experience to carry them forward from InTouch to System Platform and standardize their engineering architecture in a way that matched West Boise.”

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Chris Raymes
System Integrator, SkyIO, Inc.,
formerly known as Apex Manufacturing Solutions, LLC



Having different technology at different sites proved difficult to support, and having proprietary technology limited the resources available to support. That’s why in 2013, the City of Boise decided to standardize its technology platforms and implementations to optimize efficiency, reusability, operator training, costs, and more. System Platform and AVEVA Historian were selected for their process visualization and historization needs.

In fact, the City of Boise Public Works leans heavily on AVEVA System Platform to control both of its water/wastewater plants, support its public facilities, and supervise geothermal wells below ground that pump heat into government buildings.



“We have the same programming across the board, and when we make a change, we can deploy it down to all the instances below. It’s very handy from one place, we can log in and change any one of the sites over System Platform through that link. So it makes it very handy from an engineer’s standpoint to maintain it.”

- **Rich Taylor**

Sr. Electrical Engineer, City of Boise

AVEVA System Platform was deployed to provide visualization and control for the Dixie Drain phosphorus removal system. The coding standards developed by the city were also deployed to this new site to quickly bring Dixie Drain online.

From AVEVA System Platform, reusable engineering standards ensured that the project was deployed quickly (no need to re-invent the wheel) and could be easily maintained by city engineers and technicians already familiar with operating standards. Moreover, the use of standards allows for technicians from any of the Boise sites to provide SCADA support at this new site. Especially helpful were the object-based program

ming and inheritance of templates, which made it easy to maintain and deploy standards for customers with multi-site facilities.

Also, data from AVEVA Historian is used for reporting purposes. The net benefit was a cost savings to the city and better water quality for wildlife and recreationists. In fact, for the same cost as upgrading facilities at the existing treatment plants, the new facility at Dixie Drain removes much more phosphorus from the Boise River, creating a lower cost per pound removed and a far greater environmental outcome.



Going above and beyond with environmental return on investment

While this project was sparked as a compliance effort to meet EPA and DEQ requirements for phosphorus removal from treated water entering the Boise river, this solution enables the City of Boise to more efficiently remove 50% more phosphorus from the Snake River than it would have by using a traditional approach to waste water treatment—resulting in better water quality.

The flow and phosphorus concentration at Dixie Drain are measured at both the inlet and outlet, where operators record the pounds entering and leaving the facility. The bound phosphorus material will then be dredged and dried at Dixie Drain.

Essentially, for every pound that is not removed at a treatment facility in Boise, a pound and a half is removed downstream at Dixie Drain. By treating both upstream in Boise, and downstream at Dixie Drain, the overall benefit to the river system is greatly improved.

“At its heart what Dixie Drain is – it’s a better environmental return on investment for getting phosphorus out of the river and ultimately ending up with a cleaner Boise River and cleaner Snake River.”

- Colin Hickman

Communications Manager, City of Boise Public Works