The purchase of 49 riverside acres is setting the political stage for wastewater innovation. In 2009, at the Dixie Slough near Parma, the City of Boise purchased the acreage for a project called the Dixie Drain. The drain would chemically treat water heavy with phosphates. It would also allow the wetlands to filter pollutants in ways once common before rivers were leveed and dammed. A bold experiment in wastewater engineering, the challenge is both political and technological: it requires a level of city-state-federal intergovernmental cooperation that, thus far, has eluded this libertarian region of an anti-federal state.

The Water Quality Dilemma

The Clean Water Act is the main piece of legislation that dictates regulation of pollutants in bodies of water in the United States. The legislation and its regulations set guidelines for developing permit requirements and effluent limits for discharge from point sources such as factories and wastewater treatment plants. However, according to Justin Hayes, program director for the Idaho Conservation League, “The Clean Water Act does a horrible job of regulating the discharges from what is called nonpoint sources of pollution.” A classic example of a nonpoint source is a farm. “Think of agriculture,” Hayes elaborated. “Acres and acres of agriculture in the Treasure Valley are sources that are virtually unregulated by the Clean Water Act.” There is no specific point where all of the pollution enters the Boise River; it generally enters from the whole field as irrigation water is wasted.

Nonpoint sources of pollution are typically beyond the reach of regulation using traditional means. The Clean Water Act grants the Environmental Protection Agency (EPA) the authority to regulate pollution in bodies of water throughout the United States. Although the EPA has been granted authority to regulate point sources of pollution, it does not have that same authority when it comes to nonpoint sources of pollution. Steve Burgos, Boise City environmental manager explained, “Under the current regulatory framework of the Clean Water Act, the Environmental Protection
DIXIE DRAIN PROJECT CONCEPT

- Draining Dixie
- Boise River to the North
- Settling Pond A 6 acres
- Settling Pond B 6 acres
- Water Flow Measurement/Chemical Addition/Rapid Mix/Flocculation Basin Equipment/Storage Tank Enclosure
- Deeper Wet Pool (TYP.)
- Wetland Treatment Cells 8.5 acres
- Floc Dewatering Management Area 10 acres
- Operable Diversion Weir
- Water Return to Dixie Drain
- Approximately .25 Miles to Boise River
- Flow Control Structure Inflow Culvert
- Water Diversion from Dixie Drain
- Flow Control Structure Inflow Culvert

DRAINING DIXIE
Agency has no jurisdiction to pursue environmental improvements on agricultural drains or to require some type of numeric limit on the discharge from a farmer’s field.”

A farm, being a nonpoint source of pollution, is therefore exempt from the Clean Water Act. Some farmers are careful to self-regulate their activities, but they are not legally obligated to do so. Hayes, with a concerned tone clarified this: “Farmers can cause almost any amount of sedimentation and other pollutants to be washed off their farm fields and not really be held accountable for that under the Clean Water Act.”

As a result of the law and litigation of it, communities were left with water quality standards for rivers and streams that had been developed to address point source polluters. Although many states have tried diligently to address this pollution, ultimately the issue of nonpoint source polluters went unaddressed at the federal level. As a result, nonpoint source pollution was left to community Watershed Area Groups and Basin Area Groups, which have continuously sought to find solutions. Burgos explained that this problem plagued many communities throughout the country. “Probably the biggest challenge, and we see this in the Chesapeake Bay area too, is that you can take the point sources down to almost zero phosphorus, and when you run water quality models, you’ll see that you may not be addressing the larger
water quality issue because of the high levels of phosphorus in agricultural return flows.”

Burgos pressed this point by explaining that there are 11 primary agricultural drains that flow into the lower Boise River. The EPA has no legal mandate to regulate any of these agricultural drains, and so they are essentially exempt from the Clean Water Act’s standards. The EPA has no authority to regulate agricultural drains, and it cannot apply water quality standards to agricultural drains in an attempt to reduce pollution. As a result, the exemption of agricultural drains from the Clean Water Act is a severe obstacle to maintaining water quality standards.

Under the Clean Water Act, a city may be obligated to meet higher standards for point source pollution than the vague nonpoint standards. However, the standards placed on a city’s discharge are often not enough to maintain positive overall water quality. “If you don’t have some tools for tackling the agricultural runoff, you kind of throw the baby out with the bath water,” Hayes said. To Hayes, ignoring nonpoint sources is counterproductive. “You can only make the city so clean before they’re not really having an impact on the river anymore, but the river is not getting any better because the agricultural impact on water quality is going unaddressed.”

**Innovation Is the Solution**

“The only entity standing around that has a legal obligation and can be held accountable for the discharge is a point source structure,” Hayes said, “in this case, the City of Boise.” Hayes explained that the Dixie Drain project created a unique opportunity for Boise. The city had an opportunity to pioneer innovative wastewater treatment, while continuing to meet its civic obligations. Hayes said that the Dixie Drain project allowed for the city to say, “We’ll meet our obligation, but we’ll do it in an innovative way where we’ll put resources into treating the unregulated agricultural runoff problems.” The City of Boise decided it would clean wastewater at the Dixie site to a greater degree than it was obligated to do at the city sewage treatment plant, where it had to deal with more expensive sewage-water point sources.
Marti Bridges, whose job as total maximum daily load (TMDL) program manager for the Idaho Department of Environmental Quality (DEQ) entails managing the process for developing water quality standards on nonpoint sources, provided further insight. She explained that a TMDL is “a water quality pollutant budget. It identifies how much capacity water bodies have for specific pollutants, which we then base allocations on.” A TMDL is a critical component in conducting water quality nutrient trades, such as that proposed in the Dixie Drain project. “The City of Boise looked at moving water out of this agricultural drain and treating it,” Bridges explained. “However, they looked at treating it in an innovative way with a mixture of a nonpoint source–point source treatment scheme.”

The City of Boise planned to use the Dixie Drain to address nonpoint sources of pollutants through an innovative trade system. This tradeoff would meet the nonpoint source pollution problem in the lower Boise and Snake River system. The trade would be arranged so that the City of Boise could remove a certain amount of phosphorus at the previously unregulated Dixie agricultural drain location in exchange for a reduction in their removal requirement at the city sewage wastewater treatment plant. “It’s one of the first projects of its type that has been done, that I’m aware of,” Bridges said, “and
certainly the first of its kind in Idaho.” However, before the city could move forward with this less expensive and innovative plan, it had to navigate a series of obstacles and criticisms.

**Obstacles, Criticisms, and Concerns**

Negotiation between the City of Boise and the EPA on the trade ratio was a critical step—an obstacle in the process of cleaning the Boise River. The exchange ratio had to provide “reasonable assurance” to EPA and the nation that the City of Boise would remove the necessary amounts of pollution at Dixie, located at the confluence of the Snake and Boise Rivers near Parma, to uphold their permit requirements. The agreed on ratio, explained Burgos, was “for every pound we were obligated to take out at West Boise, we would take out a pound and a half at Dixie.”

However, before the City of Boise settled on the exchange ratio of 1.5 pounds for every 1 pound, they faced opposition from the Idaho Conservation League, a nonprofit organization. The Idaho Conservation League wanted the Dixie Drain project to proceed only if it had a net environmental benefit. “One of the ways that you can quickly figure out if it is having a net environmental benefit,” Hayes said, “is by checking to see if it is causing more pollution to be removed from the river than would have happened under a different scenario.” He added that the original version of the project was “only going to remove a fraction of the amount of pollution that the city was obligated to remove.” The result would mean that the Dixie Drain would have a negative ratio net benefit to the environment. A negative ratio net benefit for the project meant that the trade would add to environmental degradation, instead of helping reduce it. That had to change.

The Idaho Conservation League did not have a favorable view of the project at this preliminary stage. “We were not enthusiastic about that at all,” Hayes said. “The city felt like it could justify this position by looking at the way that water is diverted from the Boise River at different points of the river.” The city thought that by diverting and treating water from different points of the river that suffered from greater
degradation, they were justified in having the negative net ratio. “We felt like that was a loser proposal,” Hayes said, “and we argued about that a lot.”

The city eventually developed a positive ratio scenario. Hayes credited the development as a realization on the part of the city that if they wanted the project to move forward, it would have to have an obvious environmental benefit attached to it. Hayes stated that once the project developed the positive ratio, “It was very clear to us, and our supporters, that this was best for the river. With that, we decided we wanted to get behind it.”

Burgos claimed that the project initially received resistance from the EPA, as well as from the Idaho Conservation League. He credited a portion of the resistance to the fact that a project like this had not been done before. “We were asking for a pretty significant precedent-setting project,” Burgos said. “It is a whole heck of a lot harder to pull something off like the Dixie Drain project and get it into a permit than it would be for them [the EPA] to just follow the normal path of an NPDES [National Pollution Discharge Elimination System] permit being developed for a treatment facility.”

However, the EPA’s initial skepticism of the project faded as the city improved the ratio of pollution reductions. The City of Boise provided a better explanation, to both citizen

Wastewater is treated before being discharged into the Boise River.
groups and regulatory agencies, of what the goal of the project was. The city reinforced its commitment to the goal of a cleaner river through means of developing a positive trade ratio and actively engaging and cooperating with the parties involved. As Burgos explained, “Once it was established that, in fact, this project has a better environmental outcome, it framed the project as one that we were all pulling in the same direction.” After the city clearly established its intention, Burgos speculated that the EPA began to view the project more favorably and skepticism began to lighten. However, the project was then faced with the difficult legal obstacle of being fit into the regulatory framework of the Clean Water Act, which was originally passed in 1972.

“The Dixie Drain project is actually a very, very, complicated one,” explained Mark Ryan, former assistant regional counsel for EPA Region 10. “The concept of trading the removal of agricultural drain phosphorus for reductions in the city’s NPDES permit limits is fairly straight forward, but the devil, as they say, is in the details.” Ryan explained that the Clean Water Act does not explicitly provide a framework for a project such as the Dixie Drain. As a result, it was necessary for the EPA to “reinvent a few of our standard procedures to make this work.” The process took several hundred hours, but, Ryan added, “our management wanted this project to happen, so we worked really hard to figure it out.”

In addition, the Dixie Drain project had received criticism from some members of the community as well. Criticism was directed toward the project being only a temporary solution to the phosphorus and nonpoint source pollutant issue. As Burgos put it, “There are certainly folks of the opinion that we’re taking the quote, unquote, easy way out.” Burgos added, “We feel an obligation as a public entity to take the route that is most cost effective and that optimizes environmental benefit.”

Concerns over the project’s potential for creating a phosphorus problem between the city’s upstream wastewater treatment plant and Parma were focused on the precise location of the Dixie Drain treatment. The prime concern is that there would be a higher concentration of phosphorus in
the river between Boise and the Dixie Drain treatment plant than would exist without the Dixie Drain facility. The City of Boise again supported the idea that this would be a better environmental outcome.

Hayes addressed the concern of higher phosphorus content as well. “Having the Dixie Drain downstream from Boise means that there is a segment of river between the two that is receiving a larger dose of pollution than it would receive had the City of Boise just met their obligation at the [upstream] sewage treatment plant.” Hayes claimed that a project like the Dixie Drain should be located upstream from the city. However, because the city is at the upper end of the river, it would not be ideal in this particular situation. “It’s not causing any water quality violations that would be considered unlawful or inappropriate,” Hayes continued. “It is resulting in a degradation of water quality, not an unlawful degradation, but degradation nonetheless.”

There were additional obstacles that concerned Bridges and Idaho DEQ. Similar to other parties involved, Idaho DEQ was initially hesitant about the Dixie Drain project. The reason for its immediate hesitation to provide support for the project...
was that the lower Boise watershed lacked an approved total maximum daily load, or TMDL. The TMDL plan had been ordered by a federal court in a 2002 settlement agreement that gave the state 10 years to complete dozens of TMDLs in Idaho.

Idaho DEQ had typically been opposed to allowing trades to occur without first establishing an approved TMDL. Without an approved TMDL in place, the parties involved would have to commit otherwise unnecessary resources to gather and analyze data on the proposed project, to ensure that it had a positive net environmental benefit. “Frankly, from an agency perspective,” Bridges said, “we don’t want to have to do a bunch of analysis for a number of Dixie Drain type projects. It’s a huge time sink for staff and resources to do that, and it’s much easier to do if you have a TMDL first.” If a TMDL already existed, then the regulatory agencies would have a large amount of data to draw from, regarding which areas would benefit from trades, but the agency had dragged its feet in producing one.

**Leading by Example**

The parties involved in bringing the Dixie Drain project to life reaped a multitude of benefits. All of the parties involved stated that the project was beneficial to the river. Hayes explained that the Idaho Conservation League liked the project because it is treating “an irrigation return drain, which is an aggregated stream of water and contaminants.” He added that while the project would be doing this, the water quality would be measured throughout the process. As a result, everyone will know precisely how much phosphorus was removed during treatment. The precise measurement of phosphorus treatment at Dixie allows for the city, DEQ, and EPA to verify that the city is meeting the requirements of the newly modified permit for the City of Boise at the city wastewater treatment plant. Hayes explained that this is a great benefit to the community because it ensures continued water quality. “If you fail to achieve the necessary amount of phosphorus reduction to meet your permit limits,” Hayes said, “then you’ll be in violation of your permit and you will be penalized for that.”
The City of Boise also saw several benefits from the Dixie Drain project. The city benefited economically from implementing the Dixie Drain, and the river would be cleaned up. The City of Boise also benefited by gaining access to treating a previously untreatable source of phosphorus. This is significant for the city, because it is getting a better return on investment by treating a major source of phosphorus pollution. The city will remove more phosphorus at Dixie, per dollar spent, than it would have by purchasing immediate upgrades for the current wastewater treatment facility.

The EPA, DEQ, and the litigators of Idaho benefited from the project too. The EPA gained the benefit of receiving access to regulating a source of pollution that typically goes unaddressed and is considered a significant source of phosphorus. In essence, the EPA gained the ability to address nonpoint source pollutants as if they were a point source, which was not an option under current legislative framework and would have been a lengthy process to alter.

Bridges claimed that the DEQ benefited from the Dixie Drain project as well. The project was the sort of project that Idaho DEQ encourages. “We like to see proponents consider innovative projects,” Bridges said. “They thought out of the box, and it wasn’t the traditional type of strategy.” The agency had hoped that the Dixie Drain project would serve as an example to both cities and agriculture throughout the state.

DEQ claimed that the Dixie Drain served as a message to both municipalities and agricultural leaders that there are creative options for both trading and treating nonpoint source water quality concerns. “As an agency, we want to see all the cities in the valley improving their water quality from their discharge of pollutants,” Bridges said. A goal of DEQ as a regulatory agency is to observe the reduction of pollutant levels in rivers and to benefit fish and wildlife. Bridges added that the Dixie Drain is evidence that this is achievable on agricultural drains.

For the people of Idaho and Boise, the Dixie Drain project is a home run. The project is a serious effort by the City of Boise to address phosphorus pollution in the lower Boise River, using an approach that many consider innovative.
It would be done at a cheaper cost than simply making a bigger, more expensive water treatment plant. The project has brought together several different parties and agencies in a collaborative effort to make a difference and produce tangible results. The end result is a project that provides municipalities, agencies, environmentalists, and the public with a tool to further improve the quality and efficiency of wastewater treatment. Best of all, the water in the Boise River will be cleaner tomorrow than it is today.

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