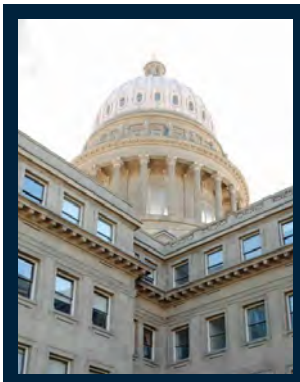
Evaluation report 14-03
July 2014

Challenges and Approaches to Meeting Water Quality Standards

Office of Performance Evaluations
Idaho Legislature

Promoting confidence and accountability in state government



Office of Performance Evaluations

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Joint Legislative Oversight Committee 2013–2014

The eight-member, bipartisan Joint Legislative Oversight Committee (JLOC) selects evaluation topics, and OPE staff conduct the evaluations. Reports are released in a public meeting of the committee. The findings, conclusions, and recommendations in OPE reports are not intended to reflect the views of JLOC or its individual members.

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Senator Dean Mortimer (R) and Representative Shirley Ringo (D) cochair the committee.

From the Director

July 3, 2014

Members
Joint Legislative Oversight Committee
Idaho Legislature

As Director Curt Fransen of the Department of Environmental Quality stated in his response to our evaluation, this report will "help stakeholders understand the tools available for dealing with...complex water quality issues."

Our report looks at use attainability analysis (UAA) and water quality trading. Conducting UAAs can be costly and require a significant amount of supporting evidence. We therefore recommend that the department complete its guidance on use attainability analyses for the benefit of local stakeholders working to ensure water quality standards are applied appropriately. The department has agreed to put forth changes to Idaho Administrative Code that address UAAs; changes that the Legislature will review.

Water quality trading is a market-based alternative for meeting water quality standards. Coordination among the department, the EPA, and local stakeholders is paramount for establishing conditions that will make trading a possibility in the future.

We appreciate the cooperation we received from department officials, and we thank the many stakeholder groups from around the state for providing input and perspective on this project.

Sincerely,

Rakesh Mohan, Director
Office of Performance Evaluations

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Included in the back of the report are formal responses from the Governor and the Department of Environmental Quality.

Executive summary

Challenges and Approaches to Meeting Water Quality Standards

States designate specific uses for water bodies based on their goals and expectations.

Legislative interest and study purpose

Water quality programs affect a diverse array of stakeholders. The federal Environmental Protection Agency (EPA), the Idaho Department of Environmental Quality (DEQ), local governments, and local water users each have a role in establishing, implementing, and complying with water quality programs. In some cases, however, the stakeholders have conflicting interests, making it difficult to agree on water quality solutions. One of the most significant challenges in meeting water quality regulations is addressing stakeholders' needs with solutions that are cost-effective and protect Idaho's waters.

In response to a request by the chairs of the Senate and House resources and environment committees, this report addresses two approaches to water quality programs that are particularly important to many stakeholders in Idaho: revising water quality standards and implementing water quality trading. Specifically, this report identifies impediments to revising water quality standards through conducting use attainability analyses and implementing a program for pollutant trading in Idaho.

Report message

Water quality standards

Under the Clean Water Act, states are responsible for reviewing, establishing, and revising water quality standards. A standard defines the water quality goals for a water body by designating the water uses. Based on goals and expectations, each state designates specific uses for its water bodies.

Each state determines its own legal and administrative procedures for adopting standards. However, each state's ability to influence water quality regulations is limited by EPA oversight. The EPA is required to review and ultimately approve or disapprove state-adopted standards. To some degree, Idaho's ability to address water quality challenges is subject to EPA approval, regardless of what the DEQ or the Legislature approves.

Although the EPA has final approval over many water quality policies, states play the central role in setting and implementing standards and criteria. States set standards that they determine are attainable. States can also revise the standard for a water body if they demonstrate that the standard is unattainable.

States play a central role in setting and implementing water quality standards and criteria.

Revising water quality standards

In order to revise or remove standards for water bodies that appear to have inappropriate designated uses, states use a process called a UAA. UAAs require states to present data on whether the standards assigned to a water body are appropriate.

States must conduct a UAA to revise water quality standards.

Designed to have an extremely high threshold, a UAA must demonstrate the need to revise standards. High thresholds can result in UAAs that are expensive and time-consuming. Stakeholders play an important role in the UAA decision-making processes. However, the lack of clear state guidance presents challenges for stakeholders to (1) determine when UAAs are the best way to proceed, and (2) prepare UAAs that meet EPA expectations.

Over the past 20 years, Idaho has submitted six UAA-based revisions to standards for EPA review. Although any entity can conduct a UAA, the DEQ conducted five of the six submitted. When considering revisions to water quality standards, the DEQ has indicated its predisposition to act conservatively. Of the resources dedicated to water quality standards, the DEQ has chosen to focus its limited resources on standards where natural conditions appear to prevent attainment of the use. The DEQ has been relatively successful in receiving EPA approval. The EPA approved removal or revision of uses for five of the six UAAs, more than all UAAs submitted by other states in EPA Region 10 combined.

Idaho has had more UAAs approved by the EPA than all UAAs submitted by other states in EPA Region 10 combined.

States can most effectively use their authority by ensuring that water bodies have properly designated uses and criteria. When correct uses are designated by the state, the most appropriate criteria can be applied to the water body, ensuring that any regulatory limitations are appropriate and standards will support the best uses attainable. **We recommend the DEQ complete its UAA guidance document intended to help stakeholders navigate the process.**

R

Total maximum daily load (TMDL) is an improvement plan for waters not meeting water quality standards.

Water quality trading

Water quality trading is one of several tools that can be used to address or mitigate the cost that stakeholders face while working to meet water quality standards. A water quality trading program allows pollutant dischargers (e.g., municipalities and industrial dischargers) to pay others (e.g., agricultural water users) to reduce pollutants more cost-effectively than would be possible through traditional water treatment options.

Trading is a tool to help meet standards that are not currently being met. Water quality trading can also incentivize new participation in pollutant reduction by those who are not currently regulated but capable of reducing pollutants at a lower cost (e.g., agricultural dischargers). Although trading can be helpful in meeting standards, alone it is not the panacea to water quality problems. Innovation and collaboration are necessary for economic and environmental improvements.

Although Idaho has developed state guidance for water quality trading, little trading has occurred. For trading to begin in earnest, the DEQ needs to include trading provisions in total maximum daily load (TMDL) plans and develop trading frameworks. Because water quality trading is subject to the same type of EPA approval as revisions to standards are, Idaho's future trading opportunities will be strongly influenced by EPA approval. Ultimately, the EPA must review and approve any revisions to pollutant discharge permits that articulate how trades will occur.

Traditional pollutant control methods consist of costly technologies implemented at water treatment facilities. Trading offers an alternative, less costly approach.

▲ Perrine Bridge over the Snake River.

Contents

▲ Goal of the Clean Water Act of 1972: all waters support safe and healthy conditions to support aquatic life and recreation.

Acknowledgment of OPE staff

Bryon Welch and Lance McCleve conducted the study.

Margaret Campbell copy edited and desktop published the report.

Acknowledgment of consultants

Andy Rowe of ARCeconomics, provided research on water quality trading and conducted a quality control review.

Brad Foltman, former administrator of the Division of Financial Management, conducted a quality control review.

Exhibits

▲ Irrigation canal near Star.

Introduction

Legislative interest and study request

In March 2013 the Joint Legislative Oversight Committee (JLOC) assigned us to study the process of revising Idaho's water quality standards and trading programs (see the request in appendix A). The request for this study came from the chairs of the three natural resource and environment committees. The chairs identified two concerns in this request.

First, the water quality standards assigned to some of Idaho's water bodies may not be appropriate. To revise standards, a scientific analysis known as use attainability analysis (UAA) documents the justification for a standards change. The chairs asked that we examine impediments to the revision of Idaho's water quality standards.

Second, water quality trading programs have not been widely implemented. Trading is a voluntary, market-based approach to improving water quality. It incentivizes entities who can reduce pollutants beyond regulatory standards and sell the excess pollutant reduction to another party faced with relatively higher pollutant reduction costs. As indicated in the request, statewide guidance has been in place in Idaho for many years with very few trades. The future viability of trading will remain uncertain as regulated dischargers, such as municipalities and industrial water users, face more stringent regulatory requirements and may be forced to implement costly upgrades to their treatment facilities. The chairs have asked us to identify obstacles to implementing water quality trading programs in Idaho.

Study scope and evaluation approach

Based upon the information presented in the study request and initial interviews with stakeholder groups, we developed a study scope that identifies the main questions this report will answer. Our study scope is in appendix B.

The requestors asked us to identify obstacles to implementing water quality trading programs in Idaho.

Acronyms

TMDL: total maximum daily load

UAA: use attainability analysis

NPDES: National Pollutant Discharge Elimination System

The DEQ is the lead state agency charged with regulating water quality policy.

The EPA maintains regulatory and final approval authority over many water quality programs.

Numerous state agencies are involved in administering water quality policies, including the Department of Environmental Quality (DEQ), the Soil and Water Conservation Commission, the Department of Fish and Game, and the Department of Agriculture. Although we interviewed officials from all of these agencies, this report focuses on the roles and responsibilities of the DEQ, as it is the lead state agency charged with regulating water quality policy. We limited our evaluation to water quality standards and trading.

The federal Environmental Protection Agency (EPA) oversees the implementation of the Clean Water Act, which is the defining legislation of water quality. Although the DEQ has received delegated authority for some monitoring and policy functions, the EPA maintains regulatory and final approval authority over many water quality programs. These programs include the authorship and approval of the National Pollutant Discharge Elimination System (NPDES) permits, approval of total maximum daily load (TMDL) plans for impaired water bodies, and final approval of any proposed changes to state water quality standards. We interviewed officials from the EPA to understand the agency's regulatory relationship with the DEQ.

The overall goal of this study is to provide policymakers with information about water quality programs in Idaho and possible areas where improvements can be made. This report highlights the challenges Idaho stakeholders face in addressing water quality standards. Specifically, the report answers the following questions:

- How are designated uses for surface waters determined and revised?
- When revising water quality standards, how are use attainability analyses developed and what is the approval process?
- What conditions are necessary to establish sustainable pollutant trading programs in Idaho?

We met with more than 50 stakeholder groups. Stakeholders play a vital role in the regulatory process, and their insights showcased a knowledge of those processes. The stakeholder groups represented a wide range of interests, such as municipalities, farmers, irrigation districts, industry, public utilities, and conservation groups. Their perspectives were extremely valuable and helped us understand the challenges of meeting increasingly stringent water quality regulations. Appendix C lists the stakeholders we interviewed.

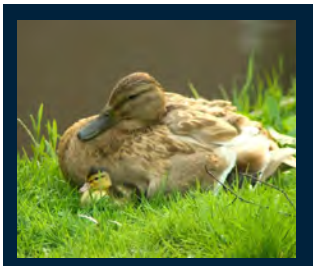
Report organization

We have organized the report into the following:

Key water quality programs gives an overview of the concepts, regulatory framework, and agency responsibilities for water quality programs. We have a narrative foundation for water quality concepts, which are discussed throughout the report. We also discuss Idaho's water quality standards and the use designation structure that informs which activities can occur on individual water bodies.

Revising uses discusses the process that states must use to change water quality standards. We include information on why changing designated uses in Idaho and other states is difficult. We also provide some local and regional context for the number of use attainability analyses that have been completed and how many resulted in changes to water quality standards.

Water quality trading is defined. We explain why trading may be beneficial for improving water quality, what makes trading possible, and what elements ultimately need to be in place for trading programs to exist in Idaho. We also provide insight into how trading works in locations outside of Idaho.



We limited our evaluation to water quality standards and trading.

▲ **Black Canyon Dam on the Payette River.**

Key water quality programs

In an effort to improve the nation's water quality, the Clean Water Act of 1972 established the goal that all waters support safe and healthy conditions to support aquatic life and recreation. To achieve this goal, the act and its subsequent amendments established two programs: (1) the water quality standards program defines the water conditions necessary to support aquatic life and recreation, and (2) the National Pollutant Discharge Elimination System (NPDES) permit program regulates the pollutants discharged into the water over time.

The water quality standards program has a reciprocal relationship with the pollutant discharge permit program. Permits protect the uses of a water body, and standards determine the discharge limits specified in the permit. When a water body does not attain its uses in spite of pollutant reductions from the permit program, states must take additional steps to determine pollutant sources and restore the quality of the water body.

▲ The Boise River visibly carries sediment as it merges with the Snake River.

Acronyms

TMDL: total maximum daily load

UAA: use attainability analysis

NPDES: National Pollutant Discharge Elimination System

The water quality standards program defines Idaho's goals for its water bodies and the environmental conditions necessary to support those goals.

Designated uses broadly define water quality for different water bodies. The Clean Water Act requires states to set standards that specify the appropriate uses for a water body, such as fish and wildlife habitat, recreation, or agriculture water supply. The act also requires that states identify the conditions necessary to support those uses. Although the act does not specify uses that states must designate, it gives preference to aquatic life and recreation and minimally requires that standards reflect existing uses. Existing uses are those uses in existence after November 28, 1975, regardless of whether states have designated them in water quality standards.

The Clean Water Act requires states to set standards that specify the appropriate uses for a water body.

Water quality standards, set by each state and approved by the EPA, consist of three main components:

- **Designated uses** describe the most fundamental uses of a water body's role for human and aquatic life. Uses, defined as goals or objectives for the quality of each water body, are specified in the states' water quality standards, regardless of whether the goals and objectives are being met.

- **Criteria** define the limits on particular pollutants in a water body. The criteria can specify maximum quantities of a given pollutant or describe the habitat conditions that support a given use.

- **Antidegradation policies** define the minimum conditions necessary to protect and maintain the current physical, chemical, and biological integrity of a water body. These policies could exceed the required efforts to support designated uses if conditions are currently maintained above the designated uses.

Uses are the basis for all regulatory action.

As assigned by states, uses are the basis for all regulatory action, such as discharge permits and pollutant load allocations. The close relationship between uses and pollutant reduction requirements means that uses should accurately reflect conditions that are attainable.

A use is attainable if its criteria can be met by a combination of (1) regulating the volume of pollutants put into the water by point source dischargers, such as municipalities, and (2) implementing

Stakeholders play a vital role in shaping Idaho's water quality programs.

The Legislature has input and approval of any changes to Idaho's water quality standards.

best management practices for nonpoint source dischargers, such as agriculture.

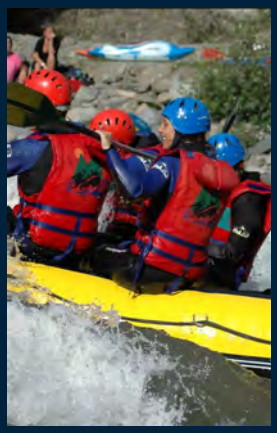
The DEQ and the EPA each manage aspects of Idaho's water quality program. The DEQ develops and enforces standards to protect uses, such as aquatic life habitat or swimming. All use designations for Idaho water bodies are codified into Idaho Administrative Code according to Idaho's formal rulemaking process, which includes approval from the Legislature.

Idaho Code directs the DEQ to consider whether proposed uses are currently being attained at the time of designation. Code also directs the DEQ to designate uses that surface water bodies can reasonably be expected to attain. In assessing the attainability of uses, the DEQ should consider any existing uses for the water body, any natural geological or biological measures that may be affecting the water body, and the economic impact of the designation. The DEQ is also directed to consult with local stakeholder groups, such as basin and watershed advisory groups, when making use designations.

Stakeholders play a vital role in shaping Idaho's water quality program by providing input to the DEQ on what uses a water body should support. Stakeholders also help identify water bodies in poor condition and formulate improvement plans to address the factors affecting the water bodies.

The EPA develops regulations and policies necessary to ensure that Idaho's standards comply with requirements of the Clean Water Act and other federal regulations. The EPA also reviews and approves all state standards developed by the DEQ. Because Idaho's water quality standards are codified in Idaho Administrative Code, the Legislature also has input and approval of any changes to Idaho's water quality standards.

Idaho's use structure consists of subcategories of the fishable, swimmable goals of the Clean Water Act.



The fishable, swimmable goals of the Clean Water Act are not always specific enough for states to define the uses of a water body and develop appropriate criteria. The Clean Water Act uses broad goals to give states flexibility to subdivide the fishable swimmable uses into subcategories that better specify uses and appropriate criteria.

Rather than simply stating that a water body needs to be fishable, subcategories can describe the biological potential for a specific water body while allowing for differences in expected biological conditions in different ecological regions. Subcategories can be defined by characteristics, such as those in the following list:

- Expected fish type, such as cold water or warm water
- Aquatic community structure and function, such as high versus low species variety or productivity
- Important aquatic community components, such as warm water fish communities dominated by bass instead of catfish
- Special uses to protect particularly unique, sensitive, or valuable aquatic species, communities, or habitats
- Self-supporting fish populations as compared with stocked fisheries

The designated uses for each state may be general, such as recreation and aquatic life, or they can be more specific, such as swimming and cold water fishery. Designated uses must be broad enough and require strong enough protections for all existing uses. Water quality standards define the goals for a water body and, when necessary, set targets for improving water quality to support designated uses.

Clarifying the use of classes is particularly helpful when waters with distinct characteristics fit within the same use category or when they do not fit well into any category. Idaho has subdivided the broad uses defined by the Clean Water Act by distinguishing between all cold and all warm water species (biota) and primary and secondary contact recreation. Exhibit 1 shows that the use structure for Idaho's aquatic life is more detailed than the uses in the Clean Water Act but less than states with further refined subcategories.

Water quality standards define the goals for a water body and set targets for improving water quality to support designated uses.

Exhibit 1

Differences in the aquatic life use structure in Idaho and Ohio illustrate how states design subcategories to accurately reflect expected water conditions.

The gray box indicates the baseline for each state.

Idaho

Use	Use description
Salmonid spawning	Support or could support a habitat for active self-propagating populations of salmonid fish
Cold water aquatic life	Protect and maintain a viable aquatic life community for cold water species
Seasonal cold water	Protect and maintain a viable aquatic life community of cool water species where cold water aquatic life may be absent during or tolerant of seasonally warm temperatures
Warm water	Protect and maintain a viable aquatic life community for warm water species
Modified	Support an aquatic life community that is limited due to certain conditions, which precludes attainment of expected uses. The EPA has not approved criteria for this use.

Ohio

Use	Use description
Seasonal salmonid habitat	Supports lake run steelhead trout; during nonspawning periods, apply exceptional warm water habitat or warm water habit uses or criteria
Cold water habitat	Native cold water or cool water species; put-and-take trout stocking
Exceptional warm water habitat	Unique and diverse assemblage of fish and invertebrates
Warm water habitat	Typical assemblages of fish and invertebrates similar to least impacted reference conditions
Modified warm water habitat	Tolerant assemblages of fish and macroinvertebrates but otherwise similar to warm water habitat; irretrievable condition precludes complete recovery to reference condition
Limited resource waters	Fish and macroinvertebrates severely limited by physical habitat or other irretrievable conditions (including human caused conditions)

Source: Idaho and Ohio water quality standards.

The DEQ has developed additional use subcategories, such as seasonal cold water and modified, that further refine aquatic life uses. A modified use was included in a use attainability analysis (UAA) for tributaries of the Boise River but no associated use criteria were developed. Critical when developing a tiered use structure is identifying criteria that are meaningfully different from criteria for other uses. If use subcategories do not have criteria that differ in a meaningful way, the distinction between the two use subcategories will not serve to protect the water bodies.

During a 2003 meeting of a national technical-expert workgroup convened by the EPA, state and tribal participants discussed how dividing uses into subcategories could benefit their water quality management programs. States identified that biologically based use subcategories could help with the following:

- Set ecologically-based aquatic life goals for water bodies
- Establish a consistent approach for identifying attainable, incremental restoration goals that are grounded in the concept of biological integrity
- Provide a framework that better relates traditional water quality criteria with biological criteria in determining use attainment
- Better link monitoring and assessment with water quality standards
- Prioritize management actions that result in more effective use of resources

Use subcategories can improve the precision of regulatory programs, such as the NPDES and TMDL programs. According to the EPA, appropriate use subcategories can maximize the likelihood that pollutant management actions will be successful. Determining whether a water body is attaining its designated use can be difficult in waters with broad use categories. Broad use categories are subject to multiple interpretations; without consensus on attainment of a water body's use, management action will be difficult.

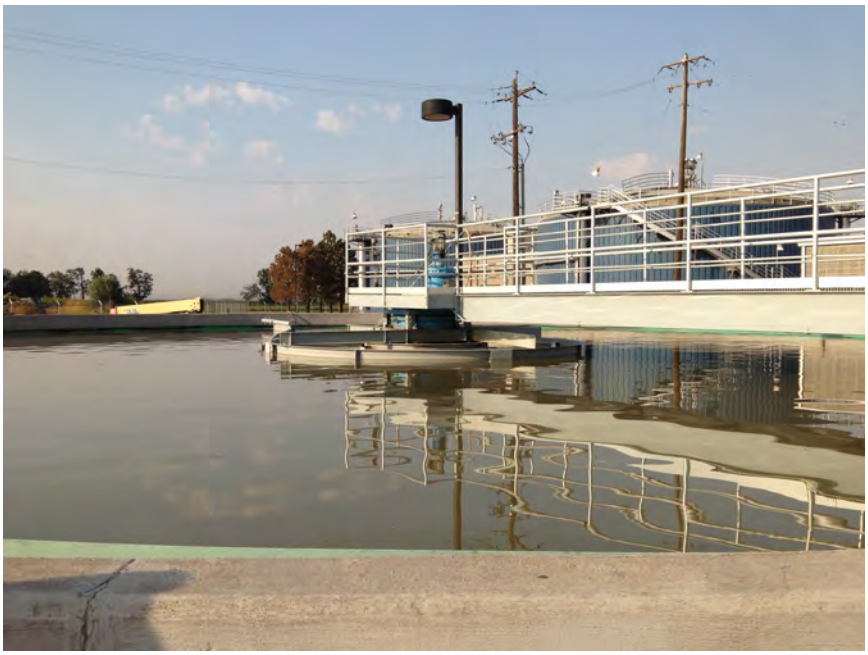
Subcategories can also increase the likelihood of successful use changes when necessary. Without a sufficiently refined structure, a state can struggle to find appropriate uses for a specific water body within its regulatory framework. For example, states might find that the most appropriate use is not a completely different use category but a more specific level within an established category. In such a case, if a state has not developed

Use subcategories can improve the precision of regulatory programs.

Broad use categories are subject to multiple interpretations.

Conducting UAAs can be more difficult in states where subcategories with supporting criteria are not developed.

subcategories with supporting criteria, a UAA might fail to support a use change simply because a more appropriate use is not available within the state's structure.



▲ **Wastewater treatment facility for the City of Meridian.**

Acronyms

TMDL: total maximum daily load

UAA: use attainability analysis

NPDES: National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System Permit Program (NPDES) regulates the amount of pollutants being put into the water.

The NPDES permit program requires pollutant sources to obtain permits before discharging into a water body. Nonpoint sources are not required to obtain a permit. Permits require the holders to meet specific pollutant control limitations, usually expressed as the maximum concentration of a particular pollutant that the holder can discharge. Discharge limits are based on both the technology available to control pollutants and levels that protect the water quality standards of the receiving water.

Not all pollutant dischargers are required to obtain permits under the program. The program distinguishes between point sources and nonpoint sources. Point sources, such as municipal wastewater treatment facilities and industrial facilities, have identifiable discharge locations and are required to obtain permits. Nonpoint sources, such as agriculture, discharge pollutants into water bodies but do not have an identifiable discharge location. The Clean Water Act exempts agricultural dischargers from needing to obtain discharge permits.

The EPA has permit writing authority under the Clean Water Act. States can take over the permit program if approved by the EPA. Idaho is one of four states that has not taken over at least a portion of the discharge permit program. However, in 2014 the Idaho Legislature passed House Bill 406 to begin the process of taking over the discharge permit program. The process will take several years to complete. After the EPA determines that Idaho has the capacity to author its own discharge permits, permit holders will work directly with the DEQ to obtain and renew discharge permits. The EPA will still ultimately approve all discharge permits, even if the DEQ takes control of the program.

The Clean Water Act exempts agricultural dischargers from needing to obtain discharge permits.

In 2014 the Idaho Legislature passed House Bill 406 to begin the process of taking over the discharge permit program.

By analyzing the sources and loads of pollutants that are preventing a water body from supporting its designated use, the water restoration program identifies actions necessary to improve water quality.

The DEQ approximates that 35% of Idaho's rivers and streams are not fully supporting uses.

The NPDES permit program primarily limits pollutant discharges from point sources; if nonpoint sources are major contributors to pollutant discharge, water bodies can fail to support their uses even when all point sources meet permit limits. If pollutant limitations set by permits are unable to improve a water body's quality to the point that the body supports its designated uses, the state must take additional regulatory action.

States are required to monitor water quality and identify waters that are not supporting their designated uses. In Idaho, the DEQ develops a list of impaired water bodies and submits it to the EPA for approval. The DEQ approximates that 35 percent of Idaho's rivers and streams are not fully supporting uses.[1] Through its integrated report, the DEQ reports biennially to the EPA on the status of Idaho's impaired waters.

Usually when a water body is impaired, the state must conduct a subbasin assessment. The assessment evaluates and summarizes the current water quality status, pollutant sources, and control actions.

TMDLs are expressed as quantities of pollutants present in a water body.

In conjunction with the subbasin assessment, states must determine the total maximum daily load (TMDL) of a given pollutant that a water body can bear and still support its designated use. The DEQ has described TMDLs as a backup to technology-based controls. TMDLs give polluters flexibility in how they will meet standards set at levels within currently available technical options that address pollutants at the water body level instead of each individual source.

TMDLs formally identify the existing pollutant load, establishes the reductions needed to meet standards, and assesses and identifies all major pollutant sources. TMDLs are expressed as quantities of pollutants present in a water body and must account for all pollutant contributions from point sources (measured sources), nonpoint sources (estimated sources), and natural

1. Percentages are of miles of streams and acres of lakes.

conditions. TMDLs also articulate the targets for pollutants with narrative standards.

TMDLs require pollutant control measures beyond what the permit program provides. Usually, point sources' new permits (based on waste load allocation established in a TMDL) will be more stringent and costly to implement necessary controls than previous permits. Nonpoint sources, although exempt from enforcement under the Clean Water Act, are encouraged to implement best management practices through assistance from state programs and federal grants, such as the 319 program that is discussed on the next page. Generally, best management practices to control nonpoint source pollutants must be implemented for a water body to meet TMDLs and standards.

TMDLs require pollutant control measures beyond what the permit program provides.

▲ **Robin Hadeler (left) of the Canyon Soil Conservation District and Bob McKellip of McKellip Farm talk about the 319 projects during the 2013 319 tour, put on by the Lower Boise Watershed Council.**

▲ 319 projects reduce pollutants that are discharged into surface waters. Projects can also increase crop productivity, like this drip irrigation system.

Federal funding for nonpoint source improvement projects does not meet demand.

The Nonpoint Source Management Program included in the federal Clean Water Act (section 319) is a federal grant program that helps states address nonpoint source pollution by adopting best management practices. The DEQ administers the program in Idaho, which is primarily funded through grants from the EPA.

The DEQ works with basin and watershed advisory groups around the state to identify water quality projects to protect and restore uses and to prevent any degradation of water quality in the future. Improvement projects are often selected from those projects that are identified as a part of the water body improvement plans or TMDLs developed by local watershed advisory group members.

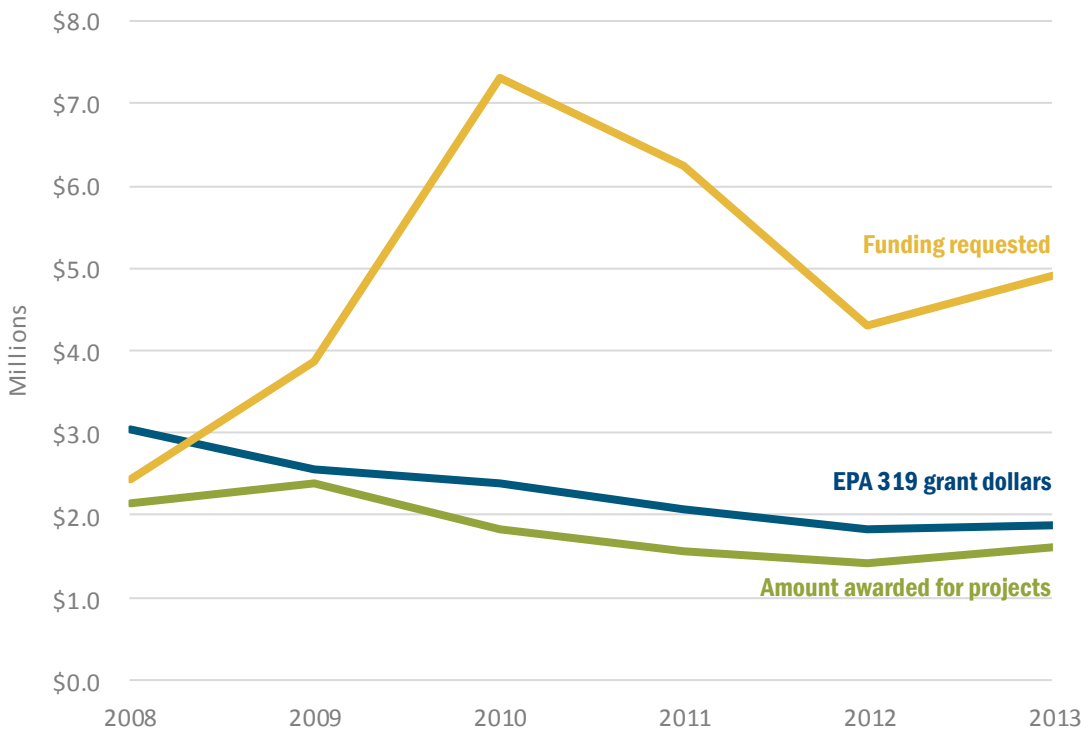
Funding has been insufficient to complete all proposed nonpoint source improvement projects. For example, in 2013 the DEQ funded 11 projects at a total cost of $1.6 million. However, 34 project applications were submitted for consideration with a requested amount of $4.9 million. From 2008 to 2013, the DEQ had approximately $30 million in funding requests for nonpoint source improvement projects that have not been funded because federal grant money was insufficient.

Over the past several years, total federal funding for nonpoint source improvement projects through the 319 program has been declining in Idaho. However, 319 grant applications have also declined. Although other federal grant programs are available to agricultural dischargers, funding is limited. Because no similar state grant programs attempt to address the implementation of nonpoint source pollution improvement projects, there continues to be an unmet need for project funding to reduce water pollution contributed by nonpoint sources. Exhibit 2 further illustrates that requests for 319 funding have been greater than the declining EPA 319 funding available.

In 2013 the DEQ funded 11 projects at a total cost of $1.6 million.

Exhibit 2

Total funding requested for nonpoint source pollution improvement projects in Idaho is greater than the amount awarded. Further, EPA 319 grant dollars have declined from 2006 levels.



Source: Data provided by the Department of Environmental Quality.

Note: The DEQ keeps a small amount of the 319 grant money for administration of the program.

◄ A drip irrigation system was installed in this mint field near Nampa—an example of a 319 project.

The DEQ, the EPA, and stakeholders all are collectively exploring solutions to address challenges associated with water quality programs.

As indicated in Idaho Code § 39-3601, the Legislature intends for the state's water quality policies to fully meet the goals and requirements of the federal Clean Water Act but not to impose additional requirements.

Uses established in state standards are the cornerstone of all programs and regulations of the Clean Water Act. A reliable set of designated uses is essential for Idaho to succeed in meeting the requirements of the Clean Water Act without imposing additional requirements. Developing reliable and attainable uses requires input and resources from the DEQ, the EPA, and stakeholders.

Idaho should ensure that designated uses are appropriate and attainable before assessing water bodies for impairment.

Idaho should ensure that designated uses are appropriate and attainable before assessing water bodies for impairment. Inappropriate designated uses can lead to unnecessary and costly regulatory control—such as TMDLs.

Overall, municipalities and industrial water users that we spoke with support Idaho refining use subcategories. They believe a more refined use structure will help ensure that permits and restoration efforts are based on meaningful standards.

Moving forward, to address the remaining pollutants found in Idaho's water bodies, the DEQ, the EPA, and stakeholders will need to come together to address both point and nonpoint source contribution of pollutants. Because project funding to implement best management practices for nonpoint source pollutants is insufficient, the DEQ and stakeholders may need to consider alternative approaches to reduce pollutants. In water quality trading, beginning on page 35, we present one alternative that is being considered by some parties in Idaho and nationally.

Revising uses

When designated uses appear to be incorrect for a water body, states can remove or revise uses by conducting a use attainability analysis. Although available to states when needed, conducting a use attainability analysis is a difficult process that can be frustrating for states and stakeholders. The lack of resources, data, and expertise for states and stakeholders to meet the requirements of a use attainability analysis add to their frustration. Idaho has been more active and successful revising and removing designated uses than have other states in EPA Region 10. However, like other states, Idaho struggles with a lack of resources, data, and expertise.

▲ Shoshone Falls on the Snake River.

States in EPA Region 10

Acronyms

TMDL: total maximum daily load

UAA: use attainability analysis

NPDES: National Pollutant Discharge Elimination System

Use attainability analysis is the principal tool that states have for determining and revising uses of a water body.

The EPA defines a UAA as a structured, scientific assessment of the factors that affect whether a water body can attain its uses.

In 1972 the Clean Water Act began requiring states to establish water quality standards. However, not all states had the resources to carefully assign meaningful standards to every water body. Meaningful standards include uses that are attainable and criteria that are sufficiently protective. As a result, states applied broad uses to many water bodies, sometimes resulting in assigned uses that could never be attained. States made broad designations under the assumption that they could revise uses if necessary.

The tool given to states for revising uses is use attainability analysis (UAA). UAAs serve as evidence for states to support their decision to remove or revise a designated use. The EPA defines a UAA as a structured scientific assessment of the factors that affect whether a water body can attain its uses. The scientific assessment of a water body evaluates the physical, chemical, and biological characteristics that determine the uses a water body can attain.

States are only required to conduct UAAs in specific circumstances. The following table shows the circumstances when a UAA is necessary and when it is not.

Generally, the UAA process begins in response to regulatory activity, such as TMDLs or new discharge permit limits. Any

A UAA is required when states want to	A UAA is not required when states want to
remove a designated fishable or swimmable use,	designate uses that are specified in the Clean Water Act,
designate a use other than fishable or swimmable,	develop a subcategory structure, or
adopt a subcategory for a use specified in the Clean Water Act,	remove designated uses that are not specified in the Clean Water Act.
change a designated use to one with less stringent criteria, or	
apply less stringent criteria.	

stakeholder, including the EPA and states, can conduct a UAA, but states must determine whether the findings warrant removing or revising a use. The DEQ reviews UAAs to determine whether the evidence supports a change to standards. If the DEQ finds that standards should be revised, it makes the appropriate change in administrative rule, which is then approved by the Legislature.

The EPA ultimately approves any changes to standards to determine whether they comply with the Clean Water Act and applicable regulations. The table below shows the six conditions under which the Clean Water Act allows a use to be considered unattainable. UAAs are the primary evidence referenced by the EPA when determining whether a state's use change meets one of the six conditions in the Clean Water Act.

The UAA process frequently begins in response to regulatory activity.

States can remove nonexisting and nonattainable designated uses.
Section 131.10(g) of the Code of Federal Regulations (40 CFR) contains the rules governing when a state can remove a use.

States may remove a designated use which is not an existing use, or establish subcategories of a use requiring less stringent criteria if the state can demonstrate that attaining the designated use is not feasible (not an attainable use) because one or more of the following six conditions exist:

1. **Naturally occurring pollution concentrations prevent the attainment of the use; or**
2. **Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or**
3. **Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or**
4. **Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or**
5. **Physical conditions related to the natural features of the water body, such as lack of proper substrate, cover, flow; depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or**
6. **Controls more stringent than those required by § 301 (b) and 306 of the Act would result in substantial and widespread economic and social hardship.**

About 68% of Idaho's waters are undesignated and fall under a presumed use.

Not every stream and lake identified as impaired requires a UAA.

UAAs are particularly important when a water body has been listed as impaired and faces regulatory action. A water body is impaired and put on the 303(d) list when it fails to meet its assigned standards. The DEQ has determined about 14 percent of Idaho's streams and 44 percent of its lakes are impaired and in need of TMDLs.[2]

About 68 percent of Idaho's waters are undesignated and fall under a presumed use. Idaho Administrative Code applies presumed cold water aquatic life and recreation uses to all undesignated waters, except those that are man-made waterways. The EPA considers presumed uses to be designated uses regardless of whether those uses have been assessed for appropriateness. Although presumed uses are most likely appropriate, it is important to consider their appropriateness and attainability before implementing significant regulatory controls.

Not every stream and lake identified as impaired requires a UAA. Further, there is no reason for the DEQ to conduct a UAA on every impaired water body. However, the DEQ may want to conduct a UAA when there is evidence that a water body has been assigned uses and criteria that are not appropriate, causing it to be listed as impaired for failing to support its designated use.

2. Percentages are of miles of streams and acres of lakes.

▲ **Agriculture canal near confluence of the Boise and Snake Rivers.**

Five of the six UAAs that Idaho has submitted to the EPA have resulted in changes to water quality standards.

Idaho has been more active and successful revising and removing designated uses than have other states in EPA Region 10.

Idaho has completed eight UAAs, all within an 11-year period from 1992 to 2003. The DEQ conducted all of the UAAs with the exception of the lower Boise River tributary, which was completed by the Lower Boise Watershed Council. Of the eight UAAs conducted, the DEQ found that six justified a change to water quality standards. Of the six submitted to the EPA, five resulted in approval of Idaho's revised standards, and one was withdrawn by the DEQ after being submitted.

Name	Year	Submission status	Outcome
Cottonwood Creek	1992	not submitted	the DEQ made no change to use
Paradise Creek	1994	not submitted	the DEQ made no change to use
Soda Creek	1997	submitted but withdrawn	no EPA action
Blackbird Creek	1997	submitted	the EPA approved use removal
Bucktail Creek	2002	submitted	the EPA approved use removal
Lower Boise River tributaries	2002	submitted	the EPA approved recreation change and rejected aquatic life change
Brownlee Reservoir	2003	submitted	the EPA approved use removal
Butcher Creek	2003	submitted	the EPA approved use removal

There is no measure or benchmark to determine whether the DEQ has conducted too many or too few UAAs.

Stakeholders recognize that identifying water bodies that justify a UAA is not a cut and dry process. Not all water bodies that face increased regulatory control warrant a UAA, and the DEQ cannot feasibly determine all of the water bodies that would benefit from a UAA. Further, there is no measure or benchmark to determine whether the DEQ has conducted too many or too few UAAs. However, Idaho has been more active in conducting UAAs than all other states in EPA Region 10. Since the UAA program began, the EPA has received eight UAAs from region 10 states—Idaho submitted six of them.

Basin and watershed advisory group chairs generally believe the DEQ is knowledgeable about water bodies that may need to have a UAA conducted.

In 2005 Idaho passed legislation to help identify which water bodies are the best candidates for a UAA. The legislation requires the DEQ to initiate the process of assessing whether to change or remove uses or criteria when a watershed advisory group or a basin advisory group advises the director that the standards are not attainable or are inappropriate. Relying on advisory groups that represent people directly affected by use designations can help the DEQ identify which water bodies would stand to benefit most from a UAA. With few exceptions, the 13 watershed and basin advisory groups we worked with believe the DEQ is knowledgeable about water bodies that may need to have a UAA conducted.

▲ **Snake River near Parma. The TMDL on the lower Boise River will be assessed near this site.**

Acronyms

TMDL: total maximum daily load

UAA: use attainability analysis

NPDES: National Pollutant Discharge Elimination System

Even when the DEQ or stakeholders identify UAA candidates, legal requirements and insufficient resources can limit the success of a UAA.

By design, the high standard of evidence for a successful UAA makes the process difficult. The standard of evidence intends to protect waters; any decision to apply less stringent standards must be scientifically and legally defensible.

Given the inherent difficulty of the UAA process, Idaho is one of many states struggling. According to a 2003 survey by the Government Accountability Office, nearly all states reported that a portion of their waters had been designated for overprotective or underprotective uses, but a lack of resources, data, and guidance have prevented them from conducting UAAs. When discussing the challenges that it faces, the DEQ cited many of the same challenges that states identified in the Government Accountability Office survey.

UAAs can be costly. The primary driver behind the cost of UAAs is the high standard of evidence required. Using existing data is the least expensive option; however, usually there is either no existing data or existing data does not adequately address the issues. To develop a UAA that the EPA would likely approve, often the DEQ must collect water quality data specific to each UAA.

In its survey of states, the US Government Accountability Office found that states reported spending from $100 to $300,000 to conduct a UAA. The cost to conduct a UAA varies based on the complexity of the water conditions being addressed and data collection requirements. The DEQ does not have data on the cost of the seven UAAs it has conducted, but the potentially high costs of producing an acceptable UAA has led the DEQ to limit its direct involvement. The DEQ intends to conduct UAAs only when existing data is available or where natural conditions prevent a use from being attained. Instead, the DEQ will focus on assisting applicants before they begin a UAA and reviewing UAAs after they are submitted.

Other impediments to conducting UAAs, as cited by the DEQ, are limited staff time and experience in implementing UAAs. Currently, there is not a position at the DEQ focused exclusively on UAAs. DEQ staff in the Water Quality Standards Division primarily take on any work relating to UAAs in addition to their other responsibilities. There are currently four staff working at

UAAs can be costly, some as much as $300,000.

The DEQ intends to conduct UAAs only when existing data is available or where natural conditions prevent a use from being attained.

Stakeholders identified a lack of funds, data, or expertise as factors limiting their ability to complete a UAA.

the DEQ central office on surface water quality standards programs. The priorities of staff time are to respond to requirements imposed by litigation and other regular responsibilities, such as preparing the integrated report, TMDL development, and legislatively mandated 5-year TMDL reviews, leaving little time to conduct UAAs.

Basin and watershed advisory groups experience challenges similar to those identified in the US Government Accountability Office survey and by the DEQ. Five of the 13 advisory groups we consulted had identified the need for a UAA but were unable to complete it. The five groups all identified a lack of funds, data, or expertise as factors limiting their ability to complete the UAA.

▲ **Many agricultural runoffs flow into this section of the Boise River near Caldwell.**

Water quality standards must protect all existing, downstream, and attainable uses.

UAAs can only support removing or changing uses if those currently applied are not existing or attainable. Existing uses are any in existence or supported in a water body on or after November 28, 1975, whether or not they are designated as such in the water quality standards. A use is attainable if it can be supported by a combination of (1) regulating the volume of pollutants put into the water by point source dischargers, such as municipalities, and (2) implementing best management practices for nonpoint source dischargers, such as agriculture.

Once identified as existing or attainable, states are obligated to designate a use with criteria that are sufficiently protective. Further, if a UAA finds an existing use with more stringent criteria than the currently designated use or that more stringent criteria are attainable, the DEQ must designate the most protective use. Many water bodies have known existing or attainable uses that preclude changes to standards based on a UAA. In addition to protecting existing and attainable uses, states' standards are required to protect downstream uses. A UAA cannot support a use change that will not protect downstream uses.

Existing uses differ from designated uses in that they are not dependent on the discretion of the state or the EPA.

UAAs can support	UAAs cannot support
No change to current standards	Removal that results in downgrading an existing use
A revised use that provides greater protection	Removal that results in downgrading an attainable use
Removal of a use	Removal or revision of a use that would result in harm to downstream uses
A refined use	Application of criteria that do not adequately protect existing, attainable, or downstream uses
Partial use or temporary suspension or modification of a use	

Formal guidance from the DEQ would assist stakeholders as they approach and conduct UAAs.

UAAs are an important tool for states as they work to ensure their water quality standards are appropriate for their waters. However, it is not an easy tool to employ. UAAs are suitable only under specific conditions; and even when a UAA appears to be the appropriate course, the DEQ and stakeholders often lack resources, data, and expertise to prepare a successful UAA.

The EPA has provided little technical guidance on conducting UAAs.

The EPA has provided little technical guidance on conducting UAAs. The DEQ and stakeholders we interviewed find UAAs difficult to prepare without guidance on the EPA's expectations. Without federal guidance in place, any guidance on the UAA process must come from the state. According to officials at EPA Region 10, the EPA has not been involved with Idaho or other states in the region to encourage or draft any UAA guidance.

In response to the difficulty of the UAA process, states have developed UAA guidance documents. Oregon and Washington, in EPA Region 10, as well as other states have developed UAA guidance manuals designed to help stakeholders understand when a UAA is an appropriate course of action and, if so, how to navigate the UAA process.

The DEQ has started to develop UAA guidance. Beginning in fiscal year 2007, the DEQ reported spending about $37,000 on guidance development and another $18,000 on reviewing and monitoring existing UAAs per federal regulations. To help Idaho's stakeholders determine when and how a UAA should be conducted and focus resources on projects where a revision to the standards can be documented and justified, **we recommend that the DEQ complete its UAA guidance document.** Depending on perspectives, the Legislature may give the DEQ direction on a timeline for implementing this recommendation.

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▲ Snake River near Twin Falls.

Water quality trading

Sometimes referred to as pollutant trading, water quality trading is a market-based alternative to meeting water quality requirements. In its most basic form, water quality trading involves an exchange between two dischargers—one (the credit purchaser) paying the other (the credit producer) to reduce pollutant discharge. In turn, the discharger who reduces pollutants satisfies the paying discharger's permit requirements.

Variations in regulatory requirements and pollutant control options pose substantially different costs for dischargers trying to achieve similar levels of pollution control in the same watershed. Cost and regulatory differences among dischargers form the basis for trading. Trading programs allow dischargers who face high pollutant control costs to manage alternative discharges to meet permit requirements. These dischargers meet the requirements at a lower cost by purchasing pollution reduction credits from dischargers who can more cost-effectively control their pollutant discharges. Trading is not a substitute for traditional regulatory programs but rather serves as a supplement to TMDLs and discharge permits by providing flexibility though a market-based approach.

Trading is not an appropriate or useful option in all parts of Idaho. For example, stakeholders developing the TMDL on the lower Boise River are actively laying the groundwork for trading to become a viable solution to address water quality needs. In contrast, stakeholders consulted in other parts of the state voiced mixed support for trading as a viable option for improving water quality in their area. Before trading can move forward, Idaho needs to complete several preconditions.

▲ **Reducing pollutants in agricultural runoff would be sold to municipalities for trading credits. This canal is in the Nampa-Meridian Irrigation District.**

Trading is not a substitute for traditional regulatory programs but rather serves as a supplement to TMDLs and discharge permits.

Acronyms

TMDL: total maximum daily load

UAA: use attainability analysis

NPDES: National Pollutant Discharge Elimination System

Water quality trading is a market-based, pollutant-reduction program that stems from the sulfur dioxide cap-and-trade program of the 1990s.

The US sulfur dioxide cap-and-trade program, often viewed as a model for other pollutant trading programs, was established with the enactment of the 1990 Clean Air Act amendments under authority granted by Title IV. In these amendments, Congress added a new subchapter titled Acid Deposition Control. The subchapter mainly addresses the causes of acid rain. For phase 1 of the program, Congress listed 111 power plants and their numerical allowances based upon historical emissions. At the start of phase 2 in 2000, the program set an aggregate cap on all power plants to 8.95 million tons of sulfur dioxide emissions per year, half of historic levels.

Trading programs are generally organized as case-by-case or open-market (cap-and-trade).

The key component of this program permitted the transfer of individual allowances or credits between power plants or other distinct organizations. Starting in 1995, the EPA began to auction allowances, and by the mid-2000, over 5,000 transactions involving more than 36 million allowances had been recorded. The result has been massive reductions in sulfur dioxide at costs well below original estimates. By using sulfur dioxide trading, the largest emitters have made the greatest reductions, and all reductions made under the program have been greater than those achieved from using localized standards.

Because of the success of sulfur dioxide trading, other market-driven, pollutant-reduction programs such as water quality trading have received substantial attention. Market-based approaches can provide flexibility and lower costs without compromising standards. The cap-and-trade and water quality trading programs are two major market-based approaches. Water quality trading can either be organized as a case-by-case program (usually for one-time, site-specific trades that require negotiation, review, and preapproval) or by an open-market program (where systems of rules allow trades without preapproval by regulators). Both the cap-and-trade and open-market programs have caps that limit pollutant discharge on a system-wide level. In the case-by-case trading program, other regulatory drivers make trading beneficial. In all instances, a regulatory limit or benchmark establishes the allowable level of pollutant discharge before a marketable credit can be produced and sold.

Although similar, case-by-case water quality trading programs differ substantially from open-market, cap-and-trade programs.

At the core, cap-and-trade and water quality trading programs enable a facility with relatively high costs of controlling discharges to seek out a facility with relatively low-control costs and buys reduction credits in lieu of making equivalent reductions at a much higher cost. The lower-control cost facility then overcontrols discharges relative to what is required under its own limits and sells the resulting credits to the higher-control cost facility. The result should be an allowable level of discharge at a lower cost with incentives to find more efficient ways to lower discharges. The transaction costs of these market-based programs are also expected to be lower than traditional regulatory approaches.

The sulfur dioxide trading program was the first air quality trading program to introduce a maximum budget or cap for emissions, hence the name cap-and-trade. The cap is set for a group of facilities (e.g., electrical generators) in a region. In contrast, water quality trading is an option that can be built into individual facility permits, specifying the maximum level of permitted discharge from the facility. The facility must still meet the technical requirements of the permit, and impairment of a specific water body is not acceptable. This program is quite different from cap-and-trade air programs where higher emissions from a facility are permitted as long as the facility obtains sufficient credits to meet its allocation.

Water quality trading should also provide environmental benefits that exceed those that would have occurred if the facility had met its permit levels without trading. This is generally accomplished through trade ratios defined in individual permits and trading frameworks. Trade ratios require the credit producer to remove a greater amount of pollutants than is required under the facility's permit alone. For example, if the trading ratio is 1.5 for every pound of pollutant that the buyer of the credit purchases, the seller of the credit must reduce 1.5 pounds of the pollutant to make a trade. This ratio ensures the trade results in a net positive environmental benefit to the watershed.

Water quality trading should also provide environmental benefits that exceed those that would have occurred without trading.

A watershed is the area of land where all water on or under the land drains into the same place.

Water quality standards, TMDLs, and pollutant discharge permits drive the motivation for trading.

Water quality standards are developed for specific pollutants, including metals, nutrients (e.g., nitrogen and phosphorous), and sediment. If a state determines that a water body does not meet its water quality standard for any pollutant, it lists the water body as impaired. The state then lists all impaired waters in an integrated report and submits it for EPA approval every two years. If a water body is listed as impaired, the state develops a total maximum daily load (TMDL) for each pollutant and water body combination not meeting water quality standards.

TMDLs define the amount of a pollutant (e.g., pounds per day of sediment) that a water body can receive and still meet its water quality standards and beneficial uses. TMDLs allocate loads to specific sources of pollutants—wasteload allocations to point sources and load allocations to nonpoint sources. Wasteload allocations are then incorporated into point source discharge permits. A TMDL is the sum of the wasteload allocations (for point sources), the load allocations (for nonpoint sources), and the natural background level of the pollutant in the water body, as well as an implicit or explicit margin of safety that allows for additional protection given the uncertain nature of various aspects of TMDL development.

Water quality trading depends on discharge limits in permits and TMDLs. The load and wasteload allocations established by TMDLs identify and limit pollutant discharge and, under appropriate conditions, can serve as the cap in a cap-and-trade program or the regulatory basis for a case-by-case trading program.

Water cap-and-trade programs

In open-market cap-and-trade programs, the loads in a TMDL are used to set the cap for all pollutant dischargers. In instances where water pollutant loads exceed the TMDL, the cap is set to reduce the pollutant level of discharges to the TMDL load levels over time. Individual sources of a targeted type of pollution obtain their own specific allowance for discharge. For example, a phosphorus TMDL for point sources would be the cap, and a facility, such as a municipal water treatment plant or aquaculture facility, would obtain an individual allowance for the amount it could contribute toward the total cap.

Water quality trading depends on discharge limits in permits and TMDLs.

Acronyms

TMDL: total maximum daily load

UAA: use attainability analysis

NPDES: National Pollutant Discharge Elimination System

The individual allowance is a permit allocated, sold, or auctioned by the regulatory entity. These individual allowances add up to the TMDL or total cap, and any individual facility exceeding its allowances needs to reduce its discharge levels accordingly or purchase additional allowances.

Case-by-case program

Idaho will not likely use an open-market cap-and-trade model for trading. The model being pursued in Idaho, more specifically on the lower Boise River, would be a case-by-case model. Trades could occur between any two dischargers but likely would occur between a point and nonpoint source or between two point sources. The two entities would enter into a voluntary agreement, outlining the specifics of the trade including the amount of pollutant reduction, life of the project, and the amount of money exchanged between parties. An independent party, or trade broker, would match parties seeking to participate in trade agreements. Before trading could occur, the discharge permit would need enabling language added to authorize the trade.

Idaho will not likely use a cap-and-trade model for trading.

Exhibit 3 on the following two pages illustrates how water quality trading functions between a point and nonpoint source in a case-by-case trading scenario.

Although water quality trading programs can be implemented in different ways, the regulatory drivers that create the environment for trading are essentially the same: state water quality standards, TMDLs, and discharge permits. These regulatory limitations form the market that drives trading in most instances.

Better irrigation practices, such as converting to sprinkler irrigation, can reduce pollutants in agricultural runoff and produce trading credits.

We illustrate two options available to point and nonpoint sources to achieve pollutant targets set by TMDLs and NPDES permits. Both options achieve the total pollutant load specified in the TMDL at significantly different costs.

Hypothetical scenario of exhibit 3

A water body has a current pollutant load of 475 lbs. per day. The concentration of the pollutant in the water body is prohibiting certain aquatic life from thriving. To correct this problem, a TMDL was developed with a maximum pollutant load of 350 lbs. per day established for the watershed. For this water body to meet the load specified by the TMDL, 125 lbs. of the pollutant will need to be reduced each day.

Through NPDES permits, point sources are regulated by the amount of pollutants they can discharge. The permits are written to comply with the use criteria and the water quality improvement plan to ensure designated uses are being met. In this scenario, the point source, a municipal wastewater treatment facility, has been informed by the regulatory agency issuing the discharge permit that the facility's pollutant limitations will be reduced from 200 lbs. to 100 lbs. per day. In order to reduce the amount of pollutants from its discharge, the facility will need to implement costly upgrades.

The nonpoint source, a crop farmer, also discharges to the same water body. The TMDL identifies that the nonpoint source is currently discharging 175 lbs. Even though the TMDL establishes a target limit of 150 lbs. for the nonpoint source, the farmer is not regulated to meet that target. Nevertheless, nonpoint sources regularly work to reduce their pollutant discharges, albeit voluntarily.

1

In the first option, the no-trade option, the point source implements costly upgrades to its facility to reduce 100 lbs. of pollutants. The facility determines that this option is perhaps the most certain because new technology will remove the appropriate amount of pollutants to meet the more stringent requirements of the discharge permits. The nonpoint source, the crop farmer, seeks out grant programs and implements best management practices to reduce pollutant by 25 lbs., enough to meet the target load allocation in the TMDL.

Between the two reduction efforts, 125 lbs. of pollutants are no longer being discharged into the water body, which meets the target established in the TMDL and supports the water body's designated uses. The overall cost is extremely high for the facility, and the facility carries almost all the burden for reducing the pollutant.

2

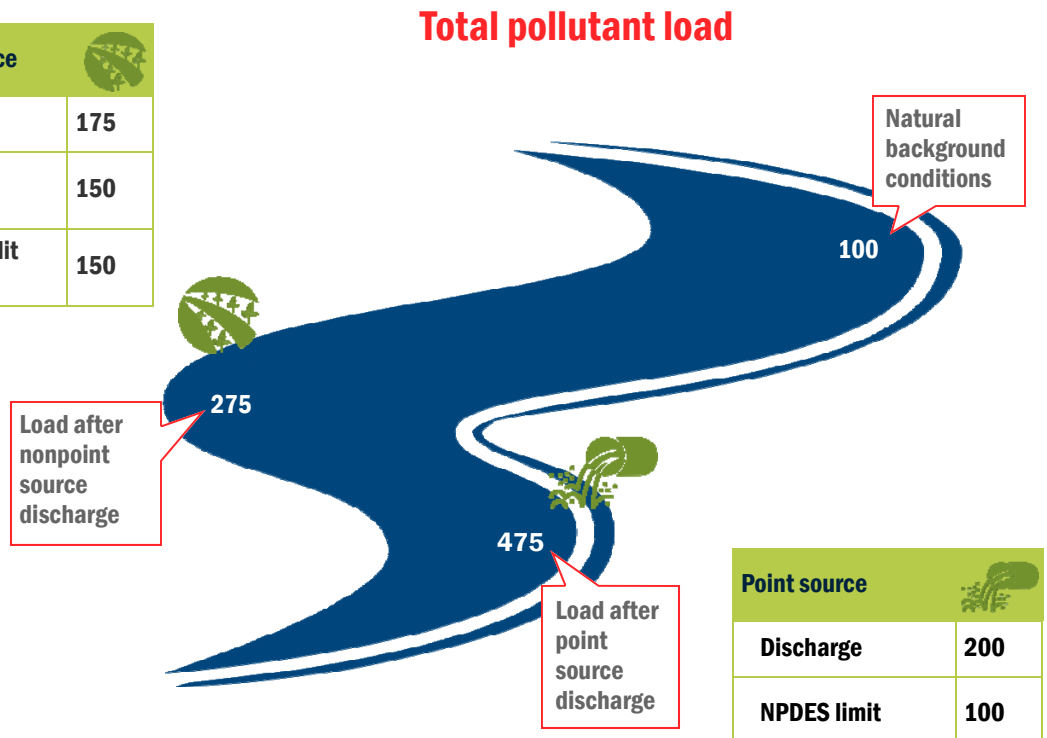
The second option uses trading to achieve the same overall pollutant reductions of option one, but at a lower cost overall. For simplicity, this option assumes a 1:1 trading ratio (actual trade ratios will likely be greater than 1:1).

In lieu of paying for costly upgrades, the facility continues to discharge 200 lbs. of pollutants and pays the farmer to implement best management practices. Implementing these practices reduces discharged pollutants by 125 lbs. The reduction covers both the amount needed to meet the TMDL target (25 lbs.) and the amount needed by the facility to meet its permit level (100 lbs.). The facility's cost of paying the crop farmer is significantly lower than if it implemented costly upgrades.

Exhibit 3

Trading can reduce overall costs of meeting the pollution reduction requirements of a total maximum daily load (TMDL).

Nonpoint source	
Discharge	175
TMDL load allocation	150
Sellable credit potential	150



Point source	
Discharge	200
NPDES limit	100
Credit purchase potential	100

TMDL	Actual
350	475

1 Scenario: no trade

Source	Reduction	Cost
Point	100	$$$$$$$$
Nonpoint	25	$
Total	125	$$$$$$$$$

2 Scenario: trade

Source	Reduction	Credits sold	Credits purchased
Point	0		$$$$$
Nonpoint	125*	$$$$$	
Total	125		

* 25 to meet the TMDL and 100 in sellable credits.

Note: Information does not represent actual nonpoint or point sources.

Twin Falls constructed a series of wetlands designed to remove sediment from agricultural and residential runoff.

Pollutant offsets are a type of water quality trading that can occur without a TMDL in place. Offsets are similar to trades but usually involve a single discharger reducing pollutants at a point other than its discharge point. On the next two pages, we describe two examples of offset projects in Idaho.

1. The City of Twin Falls, in cooperation with a local canal company, constructed a series of wetlands designed to remove sediment from agricultural and residential runoff instead of implementing costly upgrades to its wastewater treatment facility. The city estimates the costs to upgrade its wastewater treatment facility would have been $6 million. In contrast, the offset project has cost the city substantially less and has realized a reduction in sediment. The city reported that it spent $350,000 on one of two sites intended to remove sediment, primarily from agricultural runoff.

▲ **Aquatic plants and slower flows help remove sediment in the water of this constructed wetlands in Twin Falls.**

2. Responding to new, stringent discharge limitations for total phosphorus in its 2012 EPA-issued NPDES wastewater permits, the City of Boise proposed and was authorized to comply with the new limits using a combination of plant improvements (~95 percent reduction) and nonpoint source phosphorus reduction on an agricultural drain, the Dixie Slough (~5 percent reduction). The Dixie Drain Phosphorus "Offset" will reduce phosphorus concentrations discharged to the lower Boise River by twice the amount than if all reductions had occurred at the treatment facilities. The project is expected to begin operating in 2016 and remove a minimum of 25 lbs. of phosphorus per day. When the treatment plants are at full capacity, the project is expected to remove a minimum of 137 lbs. of phosphorus per day. (This project is different than the trading project described on page 45.)

The Dixie Drain Offset will help the City of Boise to reduce phosphorus concentration in the lower Boise River by twice the amount than if all reductions had occurred at the treatment facilities.

▲ **Schematic of the future Dixie Drain Offset.**

Water quality trading programs vary considerably depending on the location, pollutant being addressed, and the types of dischargers involved.

Water quality trading projects have yet to be implemented nationwide on a large scale.

Many trading projects are still in their planning phases or have only been implemented as pilot or demonstration projects. In this section, we explain two large multistate projects: the Long Island Sound has been operational for two decades, the Chesapeake Bay is still emerging. Although not on the scale of the Long Island Sound or the Chesapeake Bay projects, the Lower Boise Effluent Demonstration Trading Project provides a third example within Idaho. In all three, TMDLs drive the cap for nutrients and defines the level of reduction. All three operate in a large multistate watershed. Water quality in the Chesapeake Bay is strongly affected by nonpoint agricultural nutrients, and both the Chesapeake Bay and the Long Island Sound are in areas of dense and rapidly growing populations. The lower Boise River, in a much less populated setting, aims to address the serious phosphorus loading and nuisance aquatic growth at Brownlee Reservoir.

The Chesapeake Bay

> **Cap-and-trade and water quality trading programs have been synonymous in some applications such as the current pollutant trading program in the Chesapeake Bay watershed. The Chesapeake Bay Commission conducted an economic study of pollutant trading for the Chesapeake Bay because it has excess nutrient input, which causes seasonal algae blooms that deplete the oxygen in the water (Van Houtven, 2012).**

In December 2010 the EPA established TMDLs for the Chesapeake Bay, allocating load limits for nitrogen, phosphorous, and sediment. Water quality trading emerged as a cost-effective and flexible approach for point sources (e.g., wastewater discharge facilities) to achieve their waste load allocations. Essentially, point sources can either apply onsite pollutant controls or purchase load reductions from other sources that are able to reduce loads by more than the required amount.

The Chesapeake Bay Commission studied the potential costs of different trading scenarios based on types of sources participating and the geographic scope in which trading could occur—four of the six states that make up the Chesapeake Bay watershed have already initiated trading programs. Trading that occurred between significant regulated point sources within the same basin and the same state could reduce costs by 20 percent compared with the cost of reducing nutrients without trading.

Acronyms

TMDL: total maximum daily load

UAA: use attainability analysis

NPDES: National Pollutant Discharge Elimination System

Under the same scenario but including agricultural nonpoint sources in the trading program, potential cost savings rose to 36 percent. The study examined several other scenarios for trading and found that a potential savings of 49 percent could be achieved through a watershed-wide trading program that included both significant point sources and agricultural nonpoint sources. Estimates used in this study were fairly conservative, including a 2:1 trading ratio for agricultural nonpoint sources; however, the program is still emerging and cannot account for all potential factors, including the willingness of people to enter into the trading market.

The Long Island Sound Trading Program

In 1990, Connecticut, the State of New York, and the EPA adopted a Comprehensive Conservation and Management Plan (CCMP) for the Long Island Sound. The CCMP calls for the reduction of nitrogen to increase dissolved oxygen.... A TMDL, approved in April 2001, includes wasteload allocations for point sources and load allocations for nonpoint sources in the watershed. Connecticut chose to develop a trading program for contributing point sources within its borders to lower the cost of implementing the CCMP and the TMDL. The trading program is stipulated in state law. Connecticut's program uses both its general state authority and its NPDES permitting authority to issue a single general permit for the total nitrogen loads of all 79 wastewater treatment plants that discharge to the Sound. Sources discharging less than their annual limit receive credits for overcontrol; the State is obligated by law to purchase all nitrogen credits from these sources. Facilities that exceed their limit must purchase credits from the state at a price set by the Nitrogen Credit Exchange (Industrial Economics, 2008).

The Lower Boise Effluent Demonstration Trading Project

The Lower Boise Effluent Demonstration Trading Project seeks to help meet nutrient reduction goals set by the TMDL, which is currently being developed. Trading on the lower Boise River will be different from trading on the Long Island Sound. Trading will occur within a watershed, market-based program that includes both point and nonpoint sources, but unlike the Long Island Sound, trading will be between two parties who voluntarily decide to enter into an agreement that benefits both parties and reduces pollutants. It also differs from the Long Island Sound trading program in that the State of Idaho will not be involved in purchasing any pollutant reduction credits.

Trading on the lower Boise River will be between two parties who voluntarily enter into an agreement that benefits both parties and reduces pollutants.

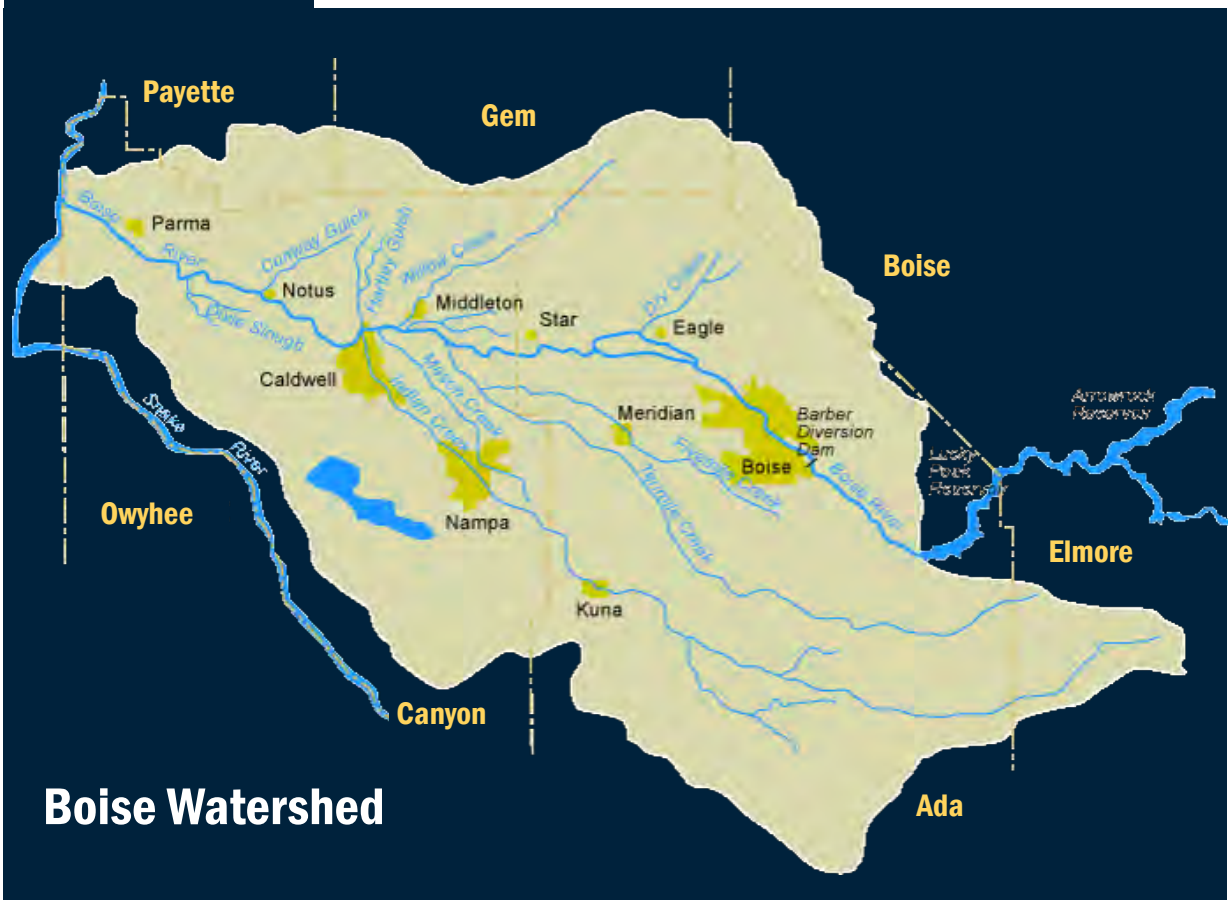
The rationale for the project lies in the serious challenges that Idaho, Oregon, Washington, and EPA Region 10 face in developing and then implementing many TMDLs on a strict court-ordered schedule. The project was delayed by the time required to complete the Snake River-Hells Canyon TMDL,

Lucky Peak Reservoir on the Boise River

which is expected to significantly reduce nutrient goals for the lower Boise River.

Attributed to the lack of a TMDL as a driver for trades, no trades to date have occurred on the lower Boise River. Additionally, many point source permits have been administratively extended while work has been done to complete the TMDL. Because the lower Boise River TMDL is not yet complete, some discharge permits are being issued based on the Snake River-Hells Canyon TMDL with pollutant limitations linked directly to TMDL wasteload allocations.

Unlike the Long Island Sound and the Chesapeake Bay, the lower Boise River has no regulatory driver in place to incentivize trading. Absent legislative and regulatory frameworks for water trading in the Chesapeake Bay and the Long Island Sound examples, a driver such as a TMDL is critical for the lower Boise River. As it stands, some of the key lower Boise River project partners are still committed to trading to address phosphorous issues and are involved in a project funded by a National Resource Conservation Service conservation innovation grant to the Willamette Partnership and the Freshwater Trust to use best management practices for the design and implementation of trading programs.



Boise Watershed

With only a few localized successes, trading programs have struggled to take hold.

Nationally, water quality trading programs first appeared in the 1980s and 1990s. Over 75 pilot projects were started across the country, and of those, an estimated 24 are currently active. The trading framework Idaho developed in the 1990s on the lower Boise River was one of the first in the Northwest. Oregon and Washington entered into trading programs in the early 2000s and have programs in several watersheds.

> **Despite the theoretical promise of water quality trading and EPA's efforts, however, water quality trading to date has met with limited practical success. Nationally, only 100 facilities have participated in trading, and 80 percent of trades have occurred within a single trading program (Long Island Sound). Moreover, relatively few trading programs have been scaled up from pilot projects to permanent programs, and even fewer can claim to have had a significant impact in improving water quality or reducing pollutant control costs. (Industrial Economics 2008, 1-6)**

In 2003 the EPA released a national policy framework for trading. Since that time, ten states, including Idaho, Oregon, and Washington, have developed statewide guidance. Initiated in 2003 and finalized in 2010, the DEQ developed water quality trading guidance to implement trading in Idaho. The guidance outlines steps to ensure trading complies with state and federal regulations. Additionally, Idaho Administrative Code allows for pollutant trading where water quality must be improved to meet standards.

Few trades have taken place in Idaho despite the state's early involvement. According to the DEQ, only one trade has occurred. The trade was between point sources (two aquaculture facilities owned by a single company) from 2009 to 2010. In contrast, trading projects in Oregon have generated credits from over 200 landowners.

Building on the limited success in parts of the Northwest, states individually and collectively are taking steps to identify and resolve barriers to implementing water quality trading programs. The Willamette Partnership has worked on trading projects in the Northwest and is working with Idaho, Oregon, Washington, and EPA Region 10 to develop a joint agreement on trading practices to (1) determine why trading opportunities and markets have not occurred more frequently, and (2) determine what general guidelines can be in place to foster trading in the future.

The lower Boise River trading framework that Idaho developed in the 1990s is one of the first in the Northwest.

Few trades have taken place in Idaho despite the state's early involvement.

Trading is a complex arrangement that requires many factors to coalesce to be successful.

EPA issued an evaluation report on water quality trading in 2008.

In addition to state and regional efforts to identify barriers to trading, the EPA issued an evaluation report on water quality trading in 2008. The evaluation focused on why water quality trading has not been more successful. The evaluation also included several specific recommendations that the EPA could do to encourage trading, including promoting institutional changes at the EPA to support trading (i.e., clarify legal issues and change guidance) and adjusting EPA allocations for trading resources.

▲ **Weiser River near the Snake River confluence.**

The EPA and the DEQ have identified regulatory conditions that must be satisfied before an active trading program can be established.

The EPA's water quality trading evaluation provides a useful summary of the institutional barriers that the EPA and its Region 10 face with design and implementation of water quality trading in general. In the following paragraphs, the evaluation speaks for itself.

As context for these recommendations, it is important to acknowledge that EPA has limited ability to address some substantial barriers to trading. In particular:

- **The Clean Water Act does not mention water quality trading, and has several requirements that pose potential impediments to trading (e.g., anti-backsliding and anti-degradation requirements; permitting and public comment requirements). A significant amount of creativity and staff time is necessary to work around the complexities caused by statutory ambiguity. Over-burdened permit writers and cautious legal counsel may be unwilling or unable to make such an investment.**

- **Water quality trading appears to be viable and sustainable only in locations where a narrow set of regulatory, economic, hydrologic, and geographic circumstances exist. Likewise, it may be limited to areas where program coordinators have both a high level of interest in trading and the talent needed to shepherd stakeholders through a challenging program development and implementation process.**

- **No generic approach works in developing a water quality trading program. The myriad local conditions noted above (regulatory, economic, hydrologic, and geographic) necessitate a customized program design.**

- **The regulatory conditions necessary for trading—e.g., TMDLs or nutrient criteria—are still not in place in many areas. States have been slow to develop TMDLs and nutrient criteria, and EPA has limited leverage in accelerating the process.**

These are some of the most significant barriers to implementing water quality trading. Given the Agency's limited leverage in addressing these barriers, it may be unrealistic to expect widespread diffusion of trading

The Clean Water Act does not mention water quality trading.

No generic approach works in developing a water quality trading program.

programs. In particular, EPA should avoid comparisons to air quality trading, which does not face the same barriers. (Industrial Economics 2008, 4-1)

Idaho has made progress on many preconditions to trading.

Regulatory hurdles are not the only impediment to trading. Trading is a complex arrangement that requires many factors to coalesce to be successful. Exhibit 4 further explains the preconditions and factors that are necessary for a successful trading program. Idaho has made progress on many preconditions to trading but still has work to do. For example, the TMDL that is being developed on the lower Boise River includes some references encouraging dischargers to employ water quality trading as a potential solution to meet pollutant allocations. The final TMDL will not likely include trading implementation details. Details will be developed in the trading framework and discharge permits after the TMDL is completed and load allocations are assigned. The trading framework, developed by the DEQ and local stakeholders, will outline the specific implementation details that will guide how all trades on the lower Boise River watershed will operate.

▲ **Discharges can be seen in the confluence of the Boise, Owyhee, and Snake rivers.**

Exhibit 4

Before trading can move forward, Idaho needs to complete several preconditions.

Requirement	Explanation	Idaho status
Trading framework	A framework specifies the following: • Which pollutants can be traded • Where trades can occur • Trading ratios • Localized impacts of trading • Verification and monitoring of credits • Overall water quality conditions A framework describes the function of any third-party entity who brokers the transaction of money for credit buyers and sellers.	The DEQ develops trading but has not completed a framework that specifies credit verification and monitoring requirements. The DEQ estimates that developing a trading framework will cost $45,000–$50,000.
Mechanisms to facilitate trading	Pollutant discharge permits authorize trading within an approved framework for a watershed. Permits must have provisions that specifically allow for trading and should clearly explain the responsibilities of credit producers and credit buyers.	Idaho does not yet write discharge permits and will have to rely on the EPA for trading provisions. The only permits that have trading provisions are general permits for aquaculture facilities.
TMDL	TMDLs authorizing trading must first be completed for trading to occur on an impaired water body. The DEQ's pollutant trading guidance indicates pollutant credits can only be produced and sold when the pollutant reduction is beyond the requirements defined in TMDLs or the discharge permit load requirements.	TMDLs are developed for the watershed and are needed only when a water body is impaired. To enable trading, the DEQ needs to add trading language to future TMDLs and update existing TMDLs, if necessary. The TMDL under development on the lower Boise River incorporates language that supports trading programs. Several completed TMDLs have or are incorporating trading language.
EPA approval	The EPA must approve (1) trading frameworks by watersheds, (2) trading provisions spelled out in pollutant discharge permits, and (3) language added to TMDLs.	The EPA maintains more oversight in Idaho than in most other states because it also issues pollutant discharge permits. Idaho is the only state in EPA Region 10 that does not issue discharge permits.
Voluntary participation	The statewide trading guidance developed by the DEQ clearly states that pollutant trading is voluntary. Parties trade when both are better off because of the trade.	Demands are occurring for new approaches to meet water quality standards. Although support for trading has been mixed, a diverse range of stakeholders have voiced their support and desire to engage in trading.

Source: Analysis of information from the Department of Environmental Quality and the Environmental Protection Agency.

Idaho stakeholders have mixed views on trading and many are wary about the uncertainty of details.

Municipalities see trading as an opportunity to meet limits in their discharge permits at a lower cost.

The significant amount of uncertainty involved in the trading process, such as the potential for more strict regulations from the EPA, has led stakeholders to be cautious about water quality trading. Municipalities see trading as an opportunity to meet limits in their discharge permits at a lower cost. Agriculture stakeholders see trading as a way to improve water quality with a potential revenue source to supplement grants and other water quality funding sources. Stakeholders from conservation organizations primarily want to ensure that trades result in measurable water quality improvement. Some stakeholders in Idaho, especially those outside the lower Boise River watershed, do not see trading as a useful option for their watersheds.

Stakeholders that we interviewed identified several key issues on which their support for trading is contingent. Although their specific concerns about trading depend on their roles as municipal, agricultural, or industrial water users, most stakeholders expressed concern about risk and lack of certainty throughout the regulatory process. Although complexity is inherent with any ecological system, the DEQ and the EPA have the ability to address some of the concerns through adaptive management to ensure progress toward improved water quality.

For example, municipalities want certainty about whether trading will reliably satisfy the requirements of their discharge permits. Municipalities' are uncertain about how a trading framework in Idaho will look, what the trading ratios will be, and which pollution reduction programs will be supported by nonpoint sources. This uncertainty can affect municipalities' willingness to rely on trading instead of onsite reductions.

Persistent challenges over the legality of trading still linger in federal courts.

Persistent challenges over the legality of trading still linger in federal courts and contribute to some groups' wary outlook on the long-term feasibility of trading. Nevertheless, the EPA and other federal agencies, such as the US Department of Agriculture, have come out in support of trading. The EPA and the US Department of Agriculture are currently working together to implement and coordinate policies and programs at the federal level to encourage trading and support states' efforts.

Idaho must meet the necessary preconditions for trading to occur, but meeting the preconditions does not guarantee success.

Finding the sweet spot for water quality trading has proved difficult compared with trading for air emissions. In the air setting, vibrant trading programs are proving their worth by reducing emissions at lower costs for facilities and regulators and providing incentives for innovation. For water, trading is more challenging because of the importance of the relative location of sources and connectivity between water bodies. Likely, more influential problems for water quality trading arise from (1) institutional issues with limited legislative authority and different approaches to setting the standards for water, and (2) having the necessary preconditions in place, such as appropriate TMDLs. As a result, the level of water quality trading nationally and in Idaho has been much lower than many hoped.

As it stands, the Lower Boise Effluent Demonstration Trading Project has foundered on the same challenges to water trading as identified by the EPA water quality trading evaluation and as described above.

The three most important preconditions for Idaho to work on, in sequential order, are (1) completing TMDLs where necessary, (2) establishing trading frameworks, and (3) incorporating trading language in pollutant discharge permits. Completed TMDLs provide the necessary driver to consider trading as a program that can help meet regulatory requirements. TMDLs also clearly assign load allocations for nonpoint sources, which provide a clear benchmark for nonpoint source dischargers to meet before credits can be produced. By watershed, trading frameworks establish the key details needed to allow interested parties to set the terms of a trade. Some of the key elements pivotal to any trading program include trade ratios, how credits will be measured and created, nonpoint source participation, and certification of trades. In most cases, after TMDLs have been developed and a trading framework is in place, trading language can then be incorporated into discharge permits that establish the legal basis for trading.

Key elements pivotal to any trading program include trade ratios, how credits will be measured and created, nonpoint source participation, and certification of trades.

Appendix A

Study Request

Sen. Monty Pearce

Rep. Lawerence Denny

Rep. Dell Raybould

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House of Representatives
State of Idaho

March 8, 2013

Joint Legislative Oversight Committee
Idaho State Capitol
700 W. Jefferson
Boise, ID 83720

Re: Request for Water Quality Program Evaluation

Dear Committee:

The Environmental Protection Agency (EPA), the Idaho Department of Environmental Quality (IDEQ), local governments and communities and stakeholders each have a role to play in establishing, implementing and complying with water quality programs in Idaho. We request that the Joint Legislative Oversight Committee (JLOC) direct the Idaho Office of Performance Evaluation (OPE) to identify and evaluate opportunities to optimize state, local and stakeholder determination and implementation of water quality programs in the State of Idaho. We would like this evaluation to include analysis of our premise that Idaho's waters are most cost-effectively protected by state and local officials working collaboratively with local communities and stakeholders who have the greatest knowledge, interest and concern about Idaho's water resources.

We are specifically interested in an evaluation of the following issues:

1. Setting appropriate water quality standards for Idaho water bodies. Correctly identifying the uses a water body can reasonably be expected to support is essential to proper water quality planning and administration. Inappropriate designation of uses for water bodies can lead to unattainable water quality objectives and programs that impose unnecessary and costly restrictions on water users. Natural and manmade conditions, and limited available funding, may prevent the attainment of certain uses. Desert streams, for example, should not be expected to reach unnaturally cold temperatures.

   When water quality monitoring and analysis indicate that a use designated for an Idaho water body is inappropriate, IDEQ has the authority and responsibility to perform a Use Attainability Analysis (UAA) to determine whether the use should be modified or removed from the water body, and the water quality standard revised accordingly.

However, UAAs are rarely prepared by IDEQ or approved by EPA. We are aware that stakeholders have been discouraged from pursing water quality standard revisions, even when they have been willing to participate in the preparation of UAAs.

We therefore request an evaluation of the impediments to the revision of Idaho Water Quality Standards through the preparation and approval of UAAs.

2. Implementation of Water Quality Pollutant Trading. IDEQ describes pollutant trading as "a business-like way of helping to improve water quality by focusing on cost-effective, local solutions to problems caused by discharges to surface waters." "Pollutant trading is voluntary and generally involves a party facing relatively high pollutant reduction costs [such as a municipal discharger] who compensates another party [such as a farmer] to achieve an equivalent, though less costly, pollutant reduction." Water quality pollutant trading is widely regarded as essential to meaningful improvement in many Idaho water bodies.

   Water quality pollutant trading frameworks have been in development in Idaho for over a decade, yet the viability of trading in Idaho remains uncertain at a time when many dischargers, particularly municipalities, are facing increasingly strict permit requirements.

   We therefore request an evaluation of the impediments to timely implementation of water quality trading for use in Idaho watersheds within the next three years.

Thank you for your consideration.

Representative Dell Raybould
Chairman, House Environment, Energy & Technology Committee

Representative Lawerence Denney
Chairman, House Resources & Conservation Committee

Senator Monty Pearce,
Chairman, Senate Resources & Environment Committee

Appendix B

Study Scope

August 2013

Study request

In March 2013 the Joint Legislative Oversight Committee directed us to evaluate opportunities to optimize water quality programs. Specifically, the chairs of the three Senate and House resources and environment committees, who requested this evaluation, wanted to understand the challenges in determining appropriate water quality standards and implementing a program for the trading of pollutant reductions in Idaho.

Water quality

Congress enacted the Clean Water Act in 1972 to establish the basic structure for regulating discharges of pollutants into the waters of the United States and to regulate quality standards for surface waters. The Clean Water Act establishes two sets of water quality regulations: pollutant discharge limitations and water quality standards.

In Idaho, the Environmental Protection Agency (EPA) implements pollutant limitations by issuing discharge permits, and the Idaho Department of Environmental Quality establishes water quality standards within the framework of the Clean Water Act. Water quality standards define the goals for state water resources by designating their uses and setting criteria to protect those designated uses. The standards are subject to EPA review and approval and can serve as the basis for pollutant limitations.

The Environmental Protection Agency, the Idaho Department of Environmental Quality, and local stakeholders play a role in establishing, implementing, and complying with water quality programs in Idaho. The coordination of these groups is instrumental for ensuring that Idaho's water quality standards are met and stakeholder interests are considered.

This report focuses soley on water quality issues—not water quantity issues.

We were directed to evaluate opportunities to optimize water quality programs.

Evaluation

This evaluation will examine what challenges Idaho stakeholders face in addressing water quality standards. The evaluation will answer the following questions:

- How are designated uses for surface water resources determined and revised?
- When revising water quality standards, how are use-attainability analyses (UAAs) developed and what is the approval process?
- What conditions are necessary to establish sustainable water pollutant trading programs in Idaho?
- How would water pollutant trading programs affect Idaho stakeholders?

Appendix C

Methodology

Because of the nature of questions raised in the study request, we spent considerable time meeting with relevant stakeholders to gather information about their involvement in the revision of water quality standards and trading programs. We also reviewed reports on water quality standards and trading programs. What follows is a summary of those efforts.

Interviews

Interviewed the study requestors: the chair of the Senate Resources and Environment Committee and the chairs of the House Environment, Energy, and Technology Committee and the House Resources and Conservation Committee.

Interviewed the director and staff at the DEQ, including staff at regional offices. We also interviewed staff from the Idaho Soil and Water Conservation Commission, the Idaho Department of Fish and Game, and the Idaho Department of Agriculture.

Interviewed staff at the EPA's Idaho Operations Office to discuss its regulatory role in water quality programs—specifically the federal Clean Water Act programs. We also interviewed staff at EPA Region 10 in Seattle to discuss UAAs and water quality trading. We interviewed staff at other federal departments and agencies, including the US Geological Survey and the US Department of Agriculture.

Interviewed municipal stakeholders including representatives from the Idaho Association of Cities, as well as representatives from the following municipalities: Boise, Caldwell, Greenleaf, Kuna, Meridian, Nampa, and Twin Falls.

Interviewed representatives from local environmental conservation groups including the Idaho Conservation League, the Nature Conservancy, and Idaho Rivers United.

Interviewed staff at the Washington State Department of Ecology and the Alaska Department of Environmental Conservation to discuss water quality standards and UAAs in their states. We

We met with more than 50 stakeholder groups.

We sent a questionarrie to all 30 basin and watershed advisory chairs.

reached out to the Oregon Department of Environmental Quality but were unable to speak to them.

Interviewed local water stakeholders representing organizations, including:

- Amalgamated Sugar Company
- Boise State University's Environmental Finance Center
- Canyon County Soil Conservation District
- Clear Springs Foods
- Darigold
- Drainage District Number 2 of Ada County
- HDR Inc.
- Idaho Farm Bureau
- Idaho Power
- Idaho Water Users Association
- Integrated Watershed Solutions Inc.
- J. R. Simplot Company
- Nampa and Meridian Irrigation District
- Northside Canal Company
- University of Idaho's Policy Analysis Group
- Willamette Partnership

Stakeholder questionnaire

We sent a questionnaire to all 30 of Idaho's basin and watershed advisory chairs seeking their input on water quality standards and trading programs. Idaho's six basin advisory groups are composed of citizen stakeholders that advise the DEQ on water quality objectives. Idaho's 24 watershed advisory groups are also composed of local citizen stakeholders that provide public input and guidance on specific watersheds when the DEQ develops TMDLs. We sent an electronic questionnaire to the chairs by e-mail. Thirteen chairs completed the questionnaire.

Site visits and meetings

Toured two municipal wastewater treatment facilities in the cities of Meridian and Greenleaf.

Toured farms in the Treasure Valley that participate in best management practices for water quality improvement funded through the 319 technical advisory committee of the Lower Boise Watershed Council.

Attended several meetings of the Lower Boise Watershed Council, including many meetings of different technical advisory committees.

Attended the fall conference of the Idaho Section of the American Water Resources Association.

Attended the 2013 Environmental Evaluators Network Pacific Forum, a gathering of evaluators, state and federal regulatory agencies, and other environmental stakeholders focused on "improving the field of environmental evaluation through more systematic and collective learning among both evaluators and evaluation users."

Attended the joint regional agreement open house on pollutant trading, presented by the DEQ, the EPA, and the Willamette Partnership.

▲ Greenleaf wastewater treatment facility.

Document reviews

Reviewed Idaho Code Title 39 Chapter 36; Idaho Administrative Code, IDAPA 58.01.02; the Federal Water Pollution Control Act (known as the Clean Water Act); and Title 40, Part 131 of the Code of Federal Regulations.

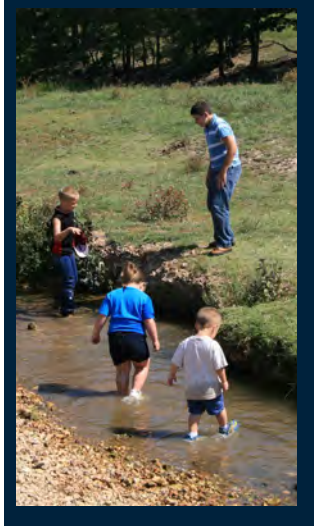
Reviewed public publications of the EPA including:

- NPDES Permit Writer's Manual
- Water Quality Standards: Examples of Alternatives to Changing Long-Term Designated Uses to Achieve Water Quality Goals
- Final Water Quality Trading Policy
- Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards
- Water Quality Trading Assessment Handbook
- Water Quality Trading Toolkit for Permit Writers
- Regional and National Overview of Use Attainability Analysis

Reviewed documents produced by the DEQ including:

- Protocols for Conducting Use Attainability Assessments for Determining Beneficial Uses to Be Designated on Idaho Stream Segments

We reviewed documents on recent efforts to revise Idaho's water quality standards.



- Water Quality Pollutant Trading Guidance
- Documents for the lower Boise River total maximum daily loads and effluent trading demonstration project
- Other individual use attainability analyses

Reviewed several documents on recent efforts to revise the water quality standards for Indian, Mason, Sand Hollow, Fivemile, Tenmile, and Fifteenmile Creeks including the UAA and the response letter with technical justification from the EPA.

Selected bibliography

We reviewed national and local research on water quality standards and trading programs. The following citations represent the range of literature we reviewed:

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Nicholas Institute for Environmental Policy Solutions. "Refining Models for Quantifying the Water Quality Benefits of Improved Animal Management for Use in Water Quality Trading." Duke University, 2014.

Swift, B. "Allowance Trading and Potential Hot Spots—Good News from the Acid Rain Program." Environment Reporter, 31.19, 2000, 354–59.

Van Houtven, G., Ross Loomis, Justin Baker, Robert Beach, and Sara Casey. "Nutrient Credit Trading for the Chesapeake Moving Pollution Trading from Air to Water: Potential, Problems, and Prognosis 171 Bay: An Economic Study." Research Triangle Park, NC: RTI International, 2012.

We reviewed a broad range of national and local research on water quality standards and trading.

We did not measure water quality, and the photos in this report were not meant to reflect any assessment of water quality.

Washington Department of Ecology. "Use Attainability Analysis Guidance for Washington State." Draft, 2005.

Woodward, R., and R. Kaiser. "Market Structures for U.S. Water Quality Trading." Review of Agricultural Economic, vol. 24, no. 2, 2002.

Credits

Aerial photos, taken in July 2013, are courtesy of Brad Foltman. The photo on page 46 is courtesy of Richard D. Campbell.

Boise Watershed and Dixie Drain schematics courtesy of the City of Boise.

Icons courtesy of Creative Commons.

State maps courtesy of Presentation Magazine.

▲ **Meridian wastewater treatment facility.**

Responses to the evaluation

OPE did a thorough examination of the UAA process and provided a detailed and valuable opinion.
—Gov. Butch Otter

We found [the report] to be a thorough and balanced report dealing with difficult and complex water quality issues.
—Curt Fransen
DEQ Director

C.L. "BUTCH" OTTER
GOVERNOR

July 1, 2014

Rakesh Mohan, Director
Office of Performance Evaluations
Idaho Legislature
954 W. Jefferson St.
Boise, ID 83720-005

Dear Director Mohan,

Thank you for the opportunity to respond to the draft report, *Challenges and Approaches to Meeting Water Quality Standards*. The report provides a fair review of the complex interaction and management of Idaho's water sources by the Idaho Department of Environmental Quality (DEQ) and the United States Environmental Protection Agency (EPA).

As you know, all the legal and administrative procedures that Idaho has put into place are subject to strict EPA oversight. As such, Idaho has employed use attainability analysis (UAA) as the mechanism by which it assesses the utility of standards it has set for various bodies of water. The Office of Performance Evaluations (OPE) did a thorough examination of the UAA process and provided a detailed and valuable opinion on the utility of these inquiries, as well as providing valuable assistance for future planning.

Lastly, it is encouraging to know that DEQ already has started the process to increase trading and improve the trading framework as a means to avoid the costly traditional pollutant control methods.

I am particularly glad to hear that there was a high level of cooperation and assistance between DEQ and OPE during the review process. This report certainly will supplement water quality protection in Idaho and further educate stakeholders on these complex issues. Thank you again for your efforts in developing this report and for the opportunity to respond.

As Always – Idaho, "Esto Perpetua"

C.L. "Butch" Otter
Governor of Idaho

CLO/laws

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STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

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C.L. "Butch" Otter, Governor
Curt Fransen, Director

June 27, 2014

Rakesh Mohan, Director
Office of Performance Evaluations
Idaho State Legislature
954 W. Jefferson St.
Boise, ID 83720

Dear Mr. Mohan,

I want to thank you and your staff for your report, *Challenges and Approaches to Meeting Water Quality Standards*. We found it to be a thorough and balanced report dealing with difficult and complex water quality issues. You and your staff are to be commended for the effort in gathering pertinent facts and viewpoints from a wide cross section of stakeholders. Below is DEQ's response to your suggestions and the recommendation for improving DEQ's water quality program. Key report suggestions and the recommendation are in italics and are followed by DEQ's response.

Section 1 Key Water Quality Programs
No formal recommendations.

The report identifies the importance of having a reliable set of designated uses, and that refining uses through the use of subcategories can improve the precision of regulatory programs. The report also notes that appropriate criteria for subcategories of uses should be developed.
DEQ's response: DEQ agrees that adopting appropriate uses, including subcategories of uses, is important. DEQ has adopted subcategories of uses for aquatic life, recreational uses and water supply. Most recently, DEQ adopted seasonal cold water and modified uses as subcategories of the aquatic life use. DEQ's latest revision to the seasonal cold water aquatic life criteria has not yet been approved by EPA. Criteria for the modified uses will depend upon a case-by-case analysis of the chemical, physical, and biological levels necessary to support the particular modified aquatic life. Therefore, no numeric state-wide criteria have been developed for modified aquatic life use.

The report comments that designated uses should be reviewed to ensure they are appropriate before assessing water bodies for impairment.
DEQ's response: DEQ agrees that ensuring that designated uses are appropriate is important. DEQ's subbasin assessment (SBA) conducted in connection with the development of a TMDL includes a review of the attainability and appropriateness of uses. TMDL Five Year Reviews also take a second look at attainability and appropriateness of uses. DEQ will continue to review its assessment and SBA/Five Year Review processes to improve how designated use reviews can best be analyzed.

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Section 2 Revising Uses
Recommendation 1.

The report recommends that, in order to help stakeholders manage the challenges associated with UAAs, DEQ should complete its UAA guidance document.
DEQ's response: DEQ agrees that the UAA guidance document may be helpful. However, prior to developing a guidance document, DEQ believes that the Idaho Administrative Procedures Act requires that there be language added to the Water Quality Standards regarding UAAs. Thus, DEQ commits to revising the Water Quality Standards by the 2016 Legislative session that adds foundational language addressing UAAs. The rule language will provide a basis for finishing guidance regarding the application of the rule's UAA provisions.

Section 3 Water Quality Trading
No formal recommendations.

The report identifies three important areas for DEQ to work on for water quality trading, (1) complete TMDLs where necessary, (2) establish trading frameworks, and (3) incorporate trading language in pollutant discharge permits.
DEQ's response: DEQ agrees on the three areas identified above that are needed to assist water quality trading. DEQ is on schedule to complete the Lower Boise River (LBR) nutrient TMDL by December 2014 with submittal to EPA for approval in January, 2015. There is strong stakeholder support for water quality trading on the LBR. There will be a section in the LBR TMDL authorizing water quality trading.

DEQ will update the list of pre-approved BMP's in the 2010 LBR Water Quality Trading Framework. DEQ continues to participate in the Joint Regional Agreement with the Willamette Partnership, Washington, Oregon and EPA. A draft "Best practices for Water Quality Trading" is expected to be publicly disseminated July 2014 and available for "piloting" the draft practices.

DEQ will work with EPA to include appropriate water quality pollutant trading language in NPDES permits as they are developed. As mentioned in your report, the Idaho Legislature recently directed DEQ to begin developing an NPDES program application package to receive program delegation from EPA Region 10. A benefit of NPDES program delegation to Idaho is that DEQ permit writers will be able to include water quality pollutant trading language into NPDES permits rather than relying upon EPA permit writers in Seattle. Additionally, DEQ permit writers will be determining the effluent limits that will be placed in the permits.

Addressing the points made in Evaluation Report 14-03 will further water quality protection and improvement in Idaho, as well as help stakeholders understand the tools available for dealing with these complex water quality issues. Thank you again for your efforts in developing this report and for the opportunity to respond.

Sincerely,

Curt Fransen
Director

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Ariel photo of Nyssa courtesy of Brad Foltman.

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