CONCEPT DRAFT

Draft date 09/30/16

Lower Boise River
Water Quality Trading Watershed Framework

Idaho Department of Environmental Quality

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To TAC Reviewers: These blue boxes will be used throughout the Concept Framework to provide you with additional information, context, and ongoing debates on the ideas described in that section.

The 9/30 version of the concept draft is intended to include the most current feedback received during TAC sessions and via written comments, inclusive of the latest round of EPA comments. We know there are some remaining questions, and that new options may change this text. We flagged those sections where we know there are issues, and listed options where we are aware of them.

This framework update is supported by technical information derived from the 2015 Lower Boise River Total Phosphorus TMDL addendum and feedback from the Boise Watershed Advisory Group's Technical Advisory Committee (TAC). The Framework has been designed to incorporate concepts from the Regional Recommendations for the Pacific Northwest on Water Quality Trading (also referred to as the Joint Regional Recommendations). This framework also incorporates recent technical work completed by Willamette Partnership (WP, 2015), The Freshwater Trust (TFT, 2015), Idaho Department of Environmental Quality (IDEQ 2016), and The Freshwater Trust (TFT, 2016).

Water quality trading, as outlined in this document is one of multiple strategies identified to achieve load reductions set forth in the Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015). The components of this water quality trading framework will be part of a broader suite of strategies under development in the Boise River (Lower) Sub-basin TMDL Implementation Plan.

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1. Introduction

The purpose of this document is to provide a framework for the implementation of water quality trading within the Lower Boise River. This Lower Boise River Water Quality Trading Framework (Framework) is designed to guide an organization or entity through the necessary components and process for participating in water quality trading. This Framework supplants the 2010 Lower Boise Trading Framework (DEQ, 2010a).

Water quality trading (also known as pollutant trading) is a flexible approach for pollutant discharge permit holders to meet regulatory obligations by working with others to generate equal or greater pollutant reductions offsite. Projects that reduce pollutants from other sources generate *credits* that can then be purchased. Buyers of credits include any public or private entity that chooses to invest in water quality improvements and other similarly quantified conservation outcomes. A "trade" occurs when water quality credits are acquired and used to satisfy a regulatory requirement, such as the water quality based effluent limit (WQBEL) in a National Pollutant Discharge Elimination System (NPDES) permit.

Offsets are activities or actions taken by a discharger outside of a formalized trading plan. An offset as defined in IDAPA 58.01.02.06(c) is a reduction in pollution from other sources that are tied to a proposed activity or discharge, must be upstream and must occur before the proposed discharge occurs. While offsets are outside the scope of this framework, standards and requirements such as monitoring and design standards should be consistent with the Lower Boise Total Phosphorus TMDL Implementation plan and requirements set by Idaho Department of Environmental Quality (DEQ).

Water quality trading is intended to work in concert with existing and ongoing efforts to enhance the Lower Boise River and watershed, particularly the implementation strategies of the Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015). DEQ has identified several total phosphorous (TP) load reduction strategies within the Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015) including:

- TP reductions from stormwater dischargers through various types of projects; increased attention to on-site stormwater inspection, and public education;
- Mitigation/elimination of non-stormwater (dry weather) discharges;
- Voluntary BMP implementation on agricultural lands, contingent on available funding, cost sharing, and willing partners (e.g., NRCS Farm Bill, 319 grant program);
- Permitting of new septic systems and promoting the use of new technology for existing septic systems;

- Offsets for reducing nonpoint source loads (i.e., sewering of septic systems); and
- Growth and development related strategies (i.e., paving new road surfaces).

As identified in the original 2010 Trading Framework, water quality trading provides several potential benefits to participants including:

- Offering municipalities flexible, cost effective options for meeting regulatory requirements as well as managing increased flows and loads associated with growth; and
- Providing non-point sources with financial resources to help them achieve reductions needed to meet TMDL goals.

This Framework describes the specific conditions under which credits may be generated and how trades may occur in the Lower Boise River Watershed. Trades are enforceable only when incorporated directly into a "trading plan" that is reviewed and approved by DEQ and U.S. Environmental Protection Agency (EPA) as part of an agency approved permit, license, or order.

1.1. Authority for Water Quality Trading in the Lower Boise

Water quality trading is recognized in Idaho's Water Quality Standards at IDAPA 58.01.02.055.06, and was identified in the Lower Boise River Total Phosphorus TMDL addendum as a means to achieve pollution reduction (DEQ, 2015). Trades must be implemented consistent with the federal Clean Water Act (CWA), statewide Water Quality Trading Guidance (DEQ, 2010a, to be updated in 2016), Lower Boise River TMDLs, and this updated Framework.

1.2. Watershed Context

The Lower Boise River Watershed (ID 17050114) drains approximately 1,290 square miles of rangeland, forests, agricultural lands, and urban areas from below Lucky Peak Dam into the Snake River at the confluence between the cities of Adrian and Nyssa, Oregon.[1] The Lower Boise River is a 64-mile long 7th-order stream, which flows northwest from the Lucky Peak Dam outfall east of Boise, through Ada and Canyon counties, to its mouth on the Snake River near Parma, Idaho. The watershed includes impaired waters for seven pollutants with TMDLs for sediment, bacteria, and phosphorus.[2] Pollutants impact cold water aquatic life, salmonid spawning, domestic

[1] For additional context information on the Lower Boise River Watershed, please refer to the Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015)

[2] IDEQ (2012) Idaho's Integrated Report pg.20-25. http://www.deq.idaho.gov/media/1117323/integrated-report-2012-final-entire.pdf.

and agricultural water supply, primary and secondary contact recreation. Sources of phosphorus within the watershed include wastewater treatment discharges, stormwater, agriculture, background (from Lucky Peak Reservoir releases), and groundwater return flows.

1.3. Framework Objectives

This Framework seeks to:

- Help implement the water quality goals described in the Lower Boise River TMDLs;
- Provide cost effective compliance options for wastewater and stormwater permittees; and
- Create voluntary incentives for projects that address non-point source pollution.

The water quality objectives of this trading Framework are tied to the following total phosphorus TMDL addendum targets and allocations (DEQ, 2015), shown in Table 1.3.

Table 1.3. Water quality goals and targets for this Framework

Goal	Target	TP TMDL Allocations	Source
Reduce Total Phosphorus (TP) loads to achieve the 2004 Snake River-Hells Canyon TMDL TP target from May 1 – September 30.	TP concentrations (and TP load equivalents) ≤ 0.07 mg/L in the Lower Boise River near Parma.	• Point sources at 0.1 mg/L TP May–September. • Point sources at 0.35 mg/L TP October–April (except Idaho Dep't of Fish & Game Eagle and Nampa facilities, which are set at 0.1 mg/L year-round). • Agricultural tributaries and ground water at 0.07 mg/L TP year-round. • Stormwater (wet weather) TP loads reduced by 42%. • Non stormwater (dry weather) TP loads reduced by 84%.	Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015)
Reduce Chlorophyll-*a* within the Middleton-to-Indian Creek and Indian Creek-to-mouth of the Lower Boise River assessment units.	Achieve mean monthly benthic (periphyton) chlorophyll-*a* target of ≤ 150 mg/m^2.		Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015)

1.4. Guiding Principles for Water Quality Trading

Trades under this Framework are designed to be consistent with the following principles:

- Trading should create a net environmental benefit;[3]
- Trades should be based in science and more effectively accomplish regulatory and environmental goals than other alternatives;
- Regulators must be able to confirm the promised water quality improvements are actually delivered;
- The benefits of trading must be delivered so it does not result in localized exceedance of water quality standards;[4]
- Trades must be consistent with Idaho water quality standards, NPDES permits, the CWA and its implementing regulations, and local laws; and
- Trades cannot circumvent existing EPA approved technology-based effluent limits (TBELs).

TAC Reviewers: Net environmental benefit can be broadly defined as additional gains in water quality or other ecological functions resulting from trades. The footnote from the principles above was added to provide the reader more context for how net environmental benefit is defined.

1.5. Public Involvement

This Framework builds heavily from the concepts included in the 2010 Lower Boise River Water Quality Trading Framework (DEQ, 2010a), which was developed through extensive engagement of local stakeholders (Ross & Associates, 2000).

The update of concepts included in this Framework were made through recommendations provided by a Technical Advisory Committee (TAC) of the Lower Boise River Watershed Advisory Group (WAG). TAC participants included members of the WAG, watershed stakeholders, DEQ, and EPA. Through a series of 4 full-day work sessions the TAC developed Framework options for review and approval. The WAG and DEQ will finalize a process to turn this concept draft into full draft and provide an opportunity for public review and DEQ approval.

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3 Meeting net environmental benefit can be done by: A) using positive trading ratios specific to environmental gain, B) applying conservative estimates in credit quantification, C) establishing baseline criteria that demonstrate progress towards the attainment of load allocations set in the TMDL, D) project types that provide other environmental benefits (e.g., habitat), and/or E) other justifications.

[4] For the purposes of trading, a *localized impact* occurs if the continued discharge from the purchasing source would impact existing and designated uses in the area immediately surrounding the discharge.

The public will also have an opportunity to review trading details for permittees during the public review of NPDES permits (40 CFR §124.10; DEQ, 2010b) or 401 certifications (DEQ, 2010b). In addition, when new or substantially revised project type quality standards are proposed, DEQ will convene a technical review process to vet those standards, as described in Section 10.1 of this Framework.

2. General Provisions for Water Quality Trading

2.1. Trading Parties and Types of Trades

Both point and nonpoint sources are eligible to generate and sell credits. Credits can be purchased to meet compliance obligations or for voluntary reasons (e.g., industry stewardship goals).

Incorporating Trading into Regulatory Documents

Where approved by DEQ and/or EPA, trading may be used to meet compliance obligations associated with a permit, order, or license. This Framework explicitly supports potential trades for the following permit types and sectors (other permit types and sectors will be considered on a case-by-case basis).

Table 2.1. Potential buyers and sellers under this Framework

Buyer/permit type	National Pollutant Discharge Elimination System (NPDES) including Municipal Separate Storm Sewer System (MS4), and 401 certifications and voluntary purchases not related to a regulatory permit.
Seller/sector type	Point sources and nonpoint sources (e.g., agriculture, wastewater treatment plant).

TAC Reviewers: There has been some discussion regarding 401 certifications and their eligibility or even demand to participate in water quality trading in the Lower Boise River Watershed. As a buyer, 401 cert. holders would need to meet the same requirements as NPDES permit types, and their permits would need to specify a numeric target of reduction.

It has been noted that existing 401 cert. holders in the Boise watershed are already meeting their phosphorus requirements through offset measures and therefore would not likely participate in trading.

Trading can be used to meet all or part of a point source discharger's water quality-based effluent limit (WQBEL), assuming all required treatment technology has been

installed and technology effluent limits (TBEL) have been met. Trading can also be used to meet point source pollutant load reduction obligations under other scenarios, including:

- To reduce existing point source discharges to a CWA §303(d)-impaired water body consistent with the Lower Boise TMDL (2015) or point sources must ensure the discharge does not increase or further impair the water body for the specific pollutant; and

- To mitigate new or expanding point source discharges to a §303(d)-impaired water body consistent with the Lower Boise TMDL (2015). If a TMDL does not have a reserve allocation for new sources, any reduction from a trade must be demonstrated before a new point source could be authorized. In addition, any new point sources must ensure their discharge does not increase or further impair the water body for the specific pollutant consistent with the requirements of 40 CFR 122.4 (i).

Reference to this Framework in a regulatory document does not alter the responsibility of an NPDES permittee to comply with the terms of that regulatory document. NPDES permittees participating in trades are responsible for the quantity and quality of the credits even when a third party acts as an aggregator or reviewer of credits.

2.2. Location: Trading Area

The trading area for this Framework is the Lower Boise River Watershed (*see* Figure 2.2), as delineated by DEQ in the TMDL (DEQ, 2015). The lower boundary of the trading area is the confluence of the Snake and Boise Rivers.[5] The upper boundary of the trading area is Lucky Peak Dam. Eligible Projects in this trading area can generate credits for eligible permittees in this trading area.

[5] It should be noted that consistent with the 2015 Total Phosphorus TMDL Addendum, Sand Hollow Creek is not considered as part of this Water Quality Trading Framework.

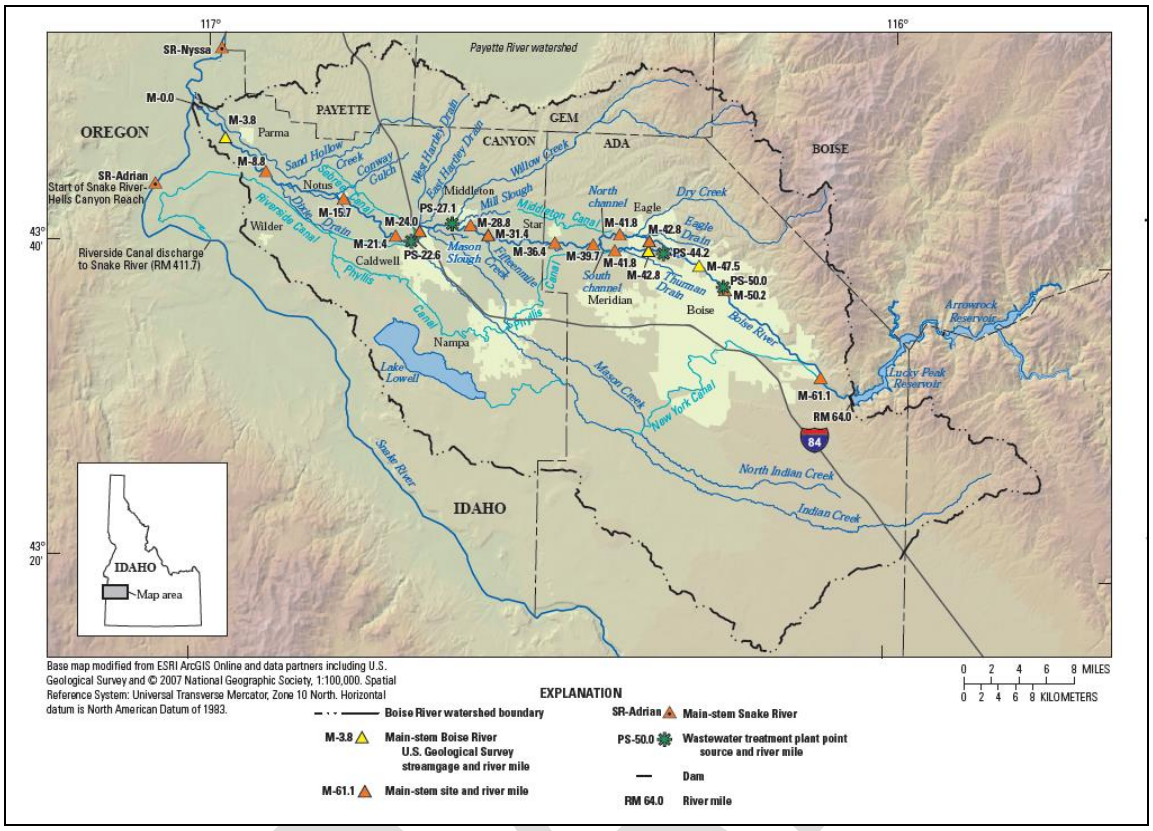

FIGURE 2-2. LOWER BOISE RIVER TRADING AREA

DEQ: Map should be updated to reflect trading area excluding Sand Hollow Creek

2.3. Eligible Pollutants & Credit Life

This Framework currently supports trades for Total Phosphorus (TP) credits, consistent with the Lower Boise River Total Phosphorus TMDL and NPDES permit limits.[6] Other pollutant types may be added under this Framework in the future with sufficient scientific information, such as that typically found in a TMDL, and approval by EPA and/or DEQ.

Credit Life: Total phosphorus

A credit's "life" is the period from the date it becomes usable by a permittee for compliance purposes through to the date when it expires and is no longer valid for compliance purposes.

[6] Total phosphorus (TP) includes all chemical forms of phosphorus. The Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015) is written for TP. There is not sufficient understanding or data to account for dissolved and particulate phosphorus differently (WP, 2015). Permit limits are typically written for TP.

For this Framework, the life of a credit is tied to two seasons- irrigation (May 1-Sept 30) and non-irrigation (Oct 1-April 30), which reflect the relationship of the credit generating project's pollutant reductions to the timing of the source discharge to be offset. This *seasonal* credit life reflects the duration of potential nonpoint TP reductions associated with the complex groundwater interactions and numerous diversions of surface water with associated return flow in the Lower Boise River watershed.[7] Table 2.3 reflects the likely credit life for different categories of credit generating projects (*see* Section 3.2 for specific project types).

Table 2.3. Credit Life

Credit Life	Project Type
Irrigation Season (May 1-Sept 30)	
	On-farm practices affecting surface irrigation runoff
	Tributary scale constructed wetlands and basins
	Point source reduction projects
Non-irrigation Season (Oct 1 – April 30)	
	Tributary scale constructed wetlands and basins
	Point source reduction projects

TAC Reviewers: At this time EPA is not supportive of an annual credit life. Technical analysis completed to support the Lower Boise River TMDL and the update of this Framework have established a more comprehensive understanding of the system dynamics and interactions between surface and groundwater. And Willamette Partnership does feel that a compelling justification for an annual credit life or a seasonal credit life can be made. However, it is the opinion of EPA staff that insufficient data and analysis currently exists to demonstrate that reduction benefits associated with irrigation related BMP practices are realized in a similar time-frame to those point-source discharges made during the non-irrigation season. EPA would be supportive of an

[7] Specifically, water that is diverted from the mainstem (and the associated phosphorus load) accumulates in shallow groundwater during the irrigation season and then permeates to the Boise River year round in "base flow" (WP, 2015). The result is that point source phosphorus loading and nonpoint source phosphorus reductions are released throughout the year (WP, 2015; Etheridge, MacCoy & Weakland, 2014; Etheridge, 2013).

annual credit life with additional research that can quantify the groundwater reductions associated with various BMPs.

EPA has stated that they would support a seasonal credit life, where those projects that operate during the irrigation season and are most likely to affect surface water runoff, would have a credit life May-Sept and those non-irrigation related projects that reduce Total Phosphorus outside the irrigation season, would have a credit life Oct-April.

Several TAC members remain supportive of an annual credit life and believe that the scientific information and recommendation from IDEQ and USGS staff are supportive of an annual credit life recommendation. Works cited include:

United States Geological Survey- Evaluation of Total Phosphorus in the Lower Boise River, Southwestern Idaho – Etheridge, A.B. 2013

United States Bureau of Reclamation/University of Idaho- Modeling Spatial Water Allocations and Hydrologic Externalities in the Boise River Valley -2009.

The Freshwater Trust – Lower Boise River Technical Analysis – 2015.

Willamette Partnership – Lower Boise Framework Updates: Findings and Recommendations 2015

3. Trading Eligibility

3.1. Eligibility for Credit Buyers

Proposed trades are described in a trading plan, which is submitted for review by EPA and DEQ as part of the procedures for NPDES permits. Trading plans submitted as part of permit reissuance will be reviewed by the permit writer and provided for comment to the public as part of the permitting process. Trading plans submitted outside of the permit issuance/reissuance process will be considered a permit modification and will be subject to public comment as part of the modification process.

TAC Reviewers: This is a clarification provided by EPA, and is consistent with interpretation of inclusion of trading in other parts of the country. It is a clear statement, so we wanted to flag it.

EPA and DEQ will review a submitted trading plan and proposed modifications, as necessary, to assure the plan complies with the CWA and NPDES permitting requirements. A permittee's trading plan may incorporate the terms of this framework by reference, or it may include all specific details within the permit itself.

Trading plans must include the following elements, many of which are addressed in this Framework:

- *Trading area*: Justify and describe how designated uses will be protected.
- *Baseline*: Sources of applicable regulation or law in trading area and how baseline is expressed (e.g., federal, state, and local regulations applicable to the land uses at play in the trading area, TMDLs and/or TMDL implementation plans, and trading guidance/framework).
- *Description of credit quantification methodology*: Describe how pre- and anticipated post-project conditions are modeled; how credit values are derived; how baseline is accounted for.
- *Description of the proportions of public and private funds used to complete each credit generating project*.
- *Trading ratio*. Articulate assumptions, calculations, and components.
- *Allowable project types*: Identify quality and performance standards.
- *Credit life*: Identify when credits become valid, how long credits remain valid, and renewability of credits.
- *Project site design, maintenance, implementation, and performance confirmation*. Determine whether these components are required and their frequency.

- *Verify project site implementation and performance*: Identify which entity will perform, the frequency, and the standards by which performance is judged.
- *Credit tracking*: Identify where information on trades will be made available.
- *Near-field analysis of potential localized impacts: (see section 3.1.2 for details).*

3.1.1. Meeting Technology-Based Effluent Limitations (TBELs)

The CWA requires point sources to meet the more stringent of TBELs or WQBELs. A point source that has attained applicable TBEL requirements, if any, can obtain credits to achieve its WQBELs.

3.1.2. Avoiding Localized Impacts on Water Quality

A permit's trading plan needs to analyze the potential for localized impacts on water quality and be specific about measures and/or water quality monitoring that will be completed to ensure there are no localized impacts. A localized impacts assessment should address the following:

- Near-field analysis of potential negative impacts on water quality in reaches downstream from a facility as a result of total phosphorus concentrations associated with that facility's effluent discharge.
- Comparison of current effluent data to relevant watershed specific information such as the TMDL for Total Phosphorus and associated modeling (AQUATOX).

3.1.3. Compliance with Antidegradation and Anti-backsliding

No trades can lower existing water quality (anti-degradation) consistent with 40 CFR §131.12 (anti-degradation), and related state requirements. In addition, subject to limited exceptions, no trades can result in the issuance of a permit with effluent limitations that are less stringent than the comparable limitations in the previous permit consistent with CWA §402(o) and 40 CFR §122.44(l) (anti-backsliding). Compliance with these regulations will be assessed and documented in individual permits, licenses or orders where trading is being considered. The Lower Boise River Total Phosphorus TMDL addendum analysis should be used to support this analysis.

3.2. Project Eligibility for Credits

Both point sources and nonpoint sources are eligible to generate credits. However, not all *projects* are eligible to generate credits. There are several checks that make sure projects create pollution reductions that lead to the water quality improvements consistent with permit requirements and TMDL goals:

- *Project site is "hydrologically connected" to the Lower Boise River system*: A hydrologic connection simplifies ratios and credit quantifications. Hydrologic

connection between a site and the Lower Boise River system can be demonstrated through connection to a tributary, drain, canal, and/or lateral as identified in the National Hydrography Dataset flowlines, and those identified by Idaho DEQ,[8] or where it can be otherwise demonstrated by the project developer that a conveyance (e.g., ditch, drain, pipe) or other direct connection is in effect (The Freshwater Trust, 2015). Project sites that cannot demonstrate a hydrologic connection cannot generate credits at this time.

- *Project uses an approved project type and updated quality standards*: All project types that generate credits need to be supported by enough information about efficacy and implementation to ensure that they deliver the promised water quality benefits. Credits can be generated from project types and associated quantification methods pre-approved by DEQ (Appendix A) or from innovative project types approved through the process outlined in Section 10.1 of this Framework.
- *Credits come from project types installed after a base year*: Projects implemented after December 31, 2012, the data year used to build the Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015) may be eligible to generate credits if sufficient data is available to demonstrate pre and post project conditions.

TAC Reviewers: 2012 is the date of the TMDL analysis data. The draft Guidance states that "a limited look-back period…typically no more than 2 years before a TMDL is approved by EPA". At the 6/16 TAC meeting additional discussion was had as to the appropriate look back period. The intent of the base-year and look back period are to 1) ensure that projects implemented are consistent with the time period of the TMDL and 2) provide some incentive for early adopters.

Considerations:

While base years beyond 2-3 may provide opportunities for those such as agricultural producers who were early adopters of BMPs, generating credits from these projects may be difficult if pre-condition information was not recorded.

- *Projects are consistent with other laws*: To generate a credit, a project should comply with applicable federal, state, and local requirements necessary to implement the project.

Table 3.2 lists project types (Point source, tributary scale wetlands and basins, and on-farm best management practices (BMPs)) that have been pre-approved by DEQ as

[8] National Hydrography Dataset flowlines are available for download from IDEQ at <need to add link>

eligible credit generating project types. The process for approving new or adjusting existing eligible BMPs is discussed in Section 10.1. Appendix A also provides additional information on the BMP project types.

TABLE 3.2: PROJECT TYPES ELIGIBLE FOR CREDIT GENERATION

Project Type	Pollution Removal Rates	Design Criteria	Lifespan
Point source upgrades	Measured	Variable	Variable
Constructed wetlands and sediment basins (tributary scale)	Measured	Variable	Variable
Sediment basins (tributary scale)[9]	65%	NRCS 350	20 years
BMP Type	**BMP Efficiency Rates[10]**	**Design Criteria**	**Lifespan**
Sediment basin (field scale)	75%	NRCS 350	20 years
Filter strips	50%	NRCS 393	1 season
Underground outlet (years 1-2)[11]	85%	NRCS 620	2 years
Underground outlet (after year 2)	65%	NRCS 620	18 years
Sprinkler irrigation	100%	NRCS 442	15 years
Microirrigation	100%	NRCS 441	10 years
Tailwater recovery	100%	NRCS 447	15 years
Surge irrigation	50%	NRCS 449[12]	1 season
Constructed wetland (farm scale)	65%	NRCS 656	15 years
Residue Mgmt (No Till)	90%	NRCS 329	1 year

TAC Reviewers: Cover Cropping was not included in the original 2010 Lower Boise Trading Framework. Based on a literature review, The Freshwater Trust suggested a 60% efficiency rate (TFT, 2015). As noted in the report, this efficiency rate should be calibrated and tested through pilots prior to incorporation into Table 3.2.

[9] Where sediment basins are proposed at a tributary or sub-watershed scale, but direct measurement is not proposed, project developers should follow NRCS design criteria and associated efficiency rate.

[10] These BMP efficiency rates are based on the analysis completed by The Freshwater Trust (TFT, 2015) to update the BMP efficiency rates included in the original Lower Boise Trading Framework (IDEQ, 2010). Unlike the original Lower Boise Trading Framework, the BMP efficiency rates in Table 4.1 do not incorporate BMP-specific uncertainty factors. These have been excluded from the field-level credit calculation process, and are instead incorporated into and covered by the 2:1 uncertainty multiplier (see Section 4.3 of this Framework).

[11] This BMP's effectiveness drops after two years, and so the remaining years of the BMP must be decreased.

[12] NRCS Practice Standard 449 – Irrigation Water Management, includes guidance on a variety of irrigation techniques, including "surge irrigation". Additional information can be found at https://efotg.sc.egov.usda.gov/references/public/ID/449_0312.pdf.

3.3. Point and Nonpoint Source Credit Baseline

Both point and nonpoint sources need to meet some minimum requirements prior to selling credits. These minimum requirements are known as "baseline."

3.3.1. Point Source Credit Baseline

For point sources, the baseline requirement is that all applicable TBELs must be met prior to generating credits. Point sources under a compliance schedule cannot generate credits until they have reduced pollutant loading beyond the final effluent limits in their permit.

3.3.2. Tributary Scale Constructed Wetlands and Basins Credit Baseline

For in-stream treatment projects, including treatment wetlands, sediment basins, and other projects that divert in-stream water and directly measure pollutant reduction, baseline requirements are set to current condition. That is, any additional pollution reduction that occurs as a result of these projects is potentially creditable.

TAC Reviewers: Comments submitted by EPA stated that project types that essentially treated waters from non-point sources, particularly those end of drain project or those which divert and treat irrigation waters, such as constructed wetlands were not contributing sources themselves and therefore should not be required to meet a minimum performance or reduction prior to generating credits.

Comments received by TAC members were that there needs to be a clear distinction between constructed wetlands/basin type projects and on-farm BMPs, however it is felt that the contribution of these types of projects towards achieving the TMDL is more appropriately expressed in a baseline requirement. That expression has yet to be determined.

3.3.3. On-farm BMP Credit Baseline

For on-farm credit BMPs that reduce nonpoint source loading, this Framework establishes staged baseline obligations consistent with the Lower Boise River Total Phosphorus TMDL addendum which acknowledges that it "may take decades" to achieve the targets established in the TMDL and therefore relies on a "staged implementation strategy" (section 5.5.1). In particular, the TMDL notes that "[i]f trading has been authorized in the area covered by this TMDL, any phased implementation plan targets for meeting load allocations may be used to derive trading baseline requirements for individual landowners wishing to sell water quality trading credits" (section 5.5.2). Staged implementation of a TMDL to achieve water quality goals is recognized under existing EPA guidance (EPA, 2006). To account for the time it takes to

plan, receive local government approval, integrate trading into permits, and develop the systems necessary to implement trading, each baseline phase is for a ten year period.

TAC Reviewers: The original intent of including staged implementation was to incentivize early action by landowners and producers recognizing that significant investment may be necessary to implement projects.

In developing and recommending a preferred approach for expressing baseline, the TAC/WAG may want to reconsider the use of a staged implementation approach. An advantage of staged baseline is that it can incentivize early action by reducing the cost of entry for participating in trading. A disadvantage to staged implementation is that it can add a layer of complexity to the program and require re-calculation/verification for projects that may be generating credits in more than one period.

EPA has noted that it is generally supportive of staged implementation. However, like the approach to baseline, the period over which implementation will occur and the time internal for each period (e.g. 10-year stages over a 30-year implementation timeline) must have sufficient justification.

Comments to the staged implementation are that it should align with the implementation timeline for the Snake River–Hells Canyon TMDL, which suggests that a 50-70 year time frame is necessary to meet water quality standards. Other comments received provided recommendations of 30 and 40 year timelines for implementation with 10 year intervals to meet load allocations to baseline. Others indicate a timeframe of 10-20 years, consistent with the maximum timeline for compliance schedules.

TAC Reviewers: Comments from EPA are that they are not supportive of a practice-based baseline that proposes a conservation (or other) plan as the implementing practice in the first stage. Throughout the Framework development process, EPA has stated that any baseline proposal must meet two criteria in order for trading to be considered in the permit process.

1. Baseline requirements in all stages of implementation must be able to demonstrate progress towards achieving nonpoint load allocations and point source wasteload allocations.

2. There needs to be a clear nexus between the baseline requirements for an individual project and the load allocations defined in the 2015 TMDL. These allocations may be by source or tributary.

For point source reductions and project types such as tributary scale constructed wetlands and sediment basins, EPA has expressed support for a baseline set to current condition (See section 3.3.1 & 3.3.2).

The following outlines two potential approaches to expressing baseline for on-farm project types that meet the criteria above. For additional information and analysis, see The Freshwater Trust's *Lower Boise River Total Phosphorus Baseline: Evaluation of Baseline Options for Water Quality Trading* report dated September 7, 2016 and available on the Watershed Advisory Group's webpage.

It should be noted that these are not the only potential methodologies that could be considered, but do provide examples of methods that meet the above criteria.

Option A: Proportional load reduction baseline

For on-farm BMP projects baseline is expressed as the proportion of a field's TP loading to the total loading for the [tributary or subwatershed] as detailed in the 2015 TP TMDL. The Surface Irrigation Soil Loss (SISL) model is used to derive an individual field's phosphorus contribution based on its physical characteristics (i.e. slope, soil type, acreage) and the observed crop rotation.[13] A ratio of the field's loading in relation to the total [tributary or subwatershed] loading is then calculated. This proportional share is multiplied by the total load reduction requirement for the [tributary or subwatershed] to determine the baseline requirement for the field.

On-farm baseline = Field level TP loading / Total [Tributary/Subwatershed] loading X Total[Tributary/Subwatershed]required load reduction

TO ADD PHASING LANGUAGE, JUST TAKE THIS SITE-SPECIFIC OBLIGATION AND ADJUST FOR THE PHASE. (E.G., PHASE 1-YEARS 1-10, 33% OF THE REDUCTION NEEDED , PHASE 2- YEARS 11-20, 66% REDUCTION NEEDED, AND PHASE 3- YEARS 20 AND BEYOND, 100% OF THE BASELINE REDUCTION NEEDED).

Considerations

Option A recognizes that different fields have different potentials for TP reductions, and provides a site-specific way to quantify baseline. Yet, that site-specific calculation does add time and cost to the process of generating credits (by running SISL each time), and creates some uncertainty for farmers who want to plan out how many credits they might have. It also creates a little more nuance for buyers assessing credit potential

[13] See Appendix B for more information about the Surface Irrigation Soil Loss model.

and cost as they're comparing compliance options. Additional time and/or process steps may also be necessary to resolve disputes regarding the calculation of baseline obligations.

Based on the analysis completed by the Freshwater Trust the range of baseline obligations for all fields across the subwatershed was 0.00 – 8.40lbs/ac with a mean of 0.93lbs/ac.

Option B: Average load reduction baseline

For on-farm BMP projects, all fields need to reduce [tributary specific reduction or watershed reduction of 1.62] lbs/acre of TP, at the final stage of phased implementation of baseline, prior to selling credits. The [tributary specific reduction or watershed reduction of 1.62] lbs/acre is based on a disaggregated load reduction for the [tributary/subwatershed]. This per-acre load reduction obligation is then multiplied by the total acreage of the field(s) to which the project type is applied.

On-farm baseline = [tributary specific reduction or watershed reduction of 1.62] lbs/acre x total acres to which project type is applied.

TO ADD PHASING LANGUAGE, JUST TAKE THE 1.62 LBS/ACRE OBLIGATION AND ADJUST FOR THE PHASE. (E.G., PHASE 1-YEARS 1-10, 0.54 LBS/ACRE , PHASE 2- YEARS 11-20, 1.08 LBS/ACRE, AND PHASE 3- YEARS 20 AND BEYOND, 1.62 LBS/ACRE).

Considerations

Option B assumes an average loading across all acreage, knowing that some fields will be loading below that level, and some above. For fields already below the baseline level lbs/acre, they will not have any credits to trade at the final stage of phased implementation of baseline.

According to the TFT analysis when calculating the baseline obligation across all surface irrigated fields in the Lower Boise River watershed, 62% have loadings above the 1.62 lbs/acre baseline or have sufficient potential reductions to generate credits. The uniform unit of reduction provides a simple and consistent methodology for calculating baseline that is likely to reduce risk and uncertainty for both credit buyers and sellers. In addition, since a uniform obligation is applied to all projects, there is less likely to be disputes regarding the modeling of baseline requirements.

TAC Reviewers: In reviewing the two options above, an additional consideration is whether the base acreage upon which the load obligation is determined is for individual

tributaries or the Lower Boise River subwatershed as a whole. Using the load allocation for individual tributaries will provide more accurate representation of an individual field's contribution to loading. However, the additional steps necessary to develop baseline obligations using individual tributary loadings is likely to increase the necessary work. Additionally, it may be challenging to determine what fields accurately contribute to which tributary and thus increase the chances of calculations being challenged.

3.4. Use of Public Conservation Funds and Credit Stacking

Credits need to come from projects creating new (or "additional") water quality benefits. Projects created to mitigate wetland impacts (credit stacking) or funded fully with public conservation funds like EPA 319 dollars were not designed to generate water quality *credits*, even if they create water quality *benefits*.

The portion of projects used for compliance/generating credits cannot be funded with cost share or other public conservation funds.[14] Public conservation funds CAN be used to help nonpoint sources meet baseline requirements (*see* Section 3.5).

There is a lot of value in leveraging multiple funding sources to create bigger, more beneficial projects. The credit developer will need to demonstrate that the credits generated from a project utilizing public conservation funds meet the conditions above. Proportional accounting is one way to show how credits generated from a project site are subdivided proportionately according to financial contribution (see WP et al., 2014). For example, if NRCS' Environmental Quality Incentives Program (EQIP) cost shares 50% of a sediment basin, and a farmer pays for 50%, then the farmer could sell 50% of the total credits from the project. This means that if the project generated 10 remaining pollutant reductions, only 5 could be sold as credits (assuming other adjustments have been applied or were not needed).

TAC Reviewers: This is consistent with the Joint Regional Recommendations and the approach that Oregon took in their recently approved rule and the current draft State Water Quality Trading Guidance.

There may be some TAC interest in revisiting this. The TAC requested other examples or legal citations. The best place to start is the National Network's Options and Considerations document, Section 3.2.6., p62.

[14] Public conservation funds are defined here to include those targeted to support voluntary natural resource protection and/or restoration. Public loans intended to be used for capital improvements of public water systems (e.g., state Clean Water Revolving Funds and USDA Rural Development funds) and utility sewer, stormwater, and surface water management fees are not considered public funds dedicated to conservation.

4. Total Phosphorus Credit Quantification

If a project type is eligible, the pollutant reductions generated by the project must be estimated or measured (quantified) in order to generate credits. Quantification is the process of developing an estimate or measurement of the pollutant reduced at the end of a pipe (point source), or at the edge of a project (nonpoint source). Pollutant reductions can be quantified in several ways to generate water quality credits. The methods currently approved for credit quantification in the Lower Boise River are shown below in Table 4.0. For all project types other quantification methods can be approved using the process described in Section 10.1 of this framework.

TABLE 4.0. APPROVED CREDIT QUANTIFICATION METHODS

Point source
Estimated reduction based on direct monitoring/measurement.
On-farm BMPs
Surface Irrigation Soil Loss (SISL) model in combination with approved individual on-farm BMP efficiency rates (Appendix A).
Estimated reduction based on direct monitoring/measurement.
Tributary scale constructed wetlands and basins
Surface Irrigation Soil Loss (SISL) model in combination with approved individual efficiency rates (Appendix A).
Estimated reductions based on direct monitoring/measurement completed prior to credit certification.

4.1. Quantifying Credits Using the Surface Irrigation Soil Loss Model:

The following are the general process steps for determining total phosphorus reductions utilizing the SISL model. Appendix B provides a detailed description of model and its application to quantify TP credits.

1. Using SISL, identify the total soil loss associated with irrigation and management practices at the field prior to implementing BMP(s).
2. Apply the appropriate efficiency rate(s) associated with the approved BMP(s) implemented at the field to determine the net reduction in total soil loss between pre-BMP and post-BMP conditions.

*Net reduction in sediment = Pre-BMP soil loss (tons) * BMP efficiency rate(s)*

3. Converted into total pounds phosphorus. The total phosphorus credits is represented by the following formula:

   Net reduction in TP (lbs) = Net reduction in sediment (tons) x 2lbs TP/ton sediment

5. Trading Ratios

Trading ratios are numeric values used to adjust credits to account for various forms of risk and uncertainty. Examples include variability in credit generating project performance or uncertainty associated with quantification modeling. A trade ratio of 2:1, to account for various forms of uncertainty, will be applied to the quantity of credits a permitted buyer needs to secure (e.g., a city will need to buy 20 credits for every 10 pounds of excess TP discharge they are seeking to trade for). The 2:1 ratio applies to both point source to point source trades and point source to nonpoint source trades.[15] Table 5 provides the basis for the 2:1 ratio using EPA's ratio types.

Table 5. Summary of trading ratios applicable in this Framework

Ratio Type	Ratio Multiplier	Notes
Delivery	N/A	The Framework incorporates a criterion that credit projects must have a direct hydrologic connection to the river for the time being (i.e., there is 100% deliver from field to stream).
Equivalency	N/A	Equivalency ratios adjust between different forms of the same pollutant. This Framework addresses all forms of phosphorus—e.g., dissolved and particulate phosphorus—as total phosphorus because tools are not currently available to distinguish the effect of separate chemical forms of phosphorus. Likewise, this Framework does not currently provide for equivalency between sediment, nitrogen, phosphorus, temperature, or other pollutants affecting algal blooms and dissolved oxygen levels. As a result, equivalency ratios are not included in this Framework at this time.
Uncertainty	2:1	This multiplier accounts for the following factors (*see*

[15] See the Idaho State Guidance on Water Quality Trading for a full list of potential trading ratios that can be included. Additional information on trading ratios, options, and considerations can be found in the National Network on Water Quality Trading's *Building a Water Quality Trading Program* available at: http://nnwqt.org/products/.

The BMP-specific uncertainty ratios included in the original Lower Boise Trading Framework (DEQ, 2010a) and discussed by The Freshwater Trust (TFT, 2015) are incorporated into and covered by this 2:1 uncertainty multiplier. As such, BMP-specific uncertainty factors are not applied when calculating credits generated from individual fields

		EPA, 2014): • Meteorological conditions; • Variability in project type efficiency rates,[16] operations, and risk that the project type will fail; • Any time lag for restoration projects that take time to mature; • Credit estimation error; • Unknown differences in how dissolved and particulate phosphorus act in the watershed; and • Effects of agricultural water reuse on delivery of pollution reductions to the Lower Boise River.
Reserve	N/A	Point sources are responsible for maintaining their own reserves of credits to ensure compliance. As a result, reserve ratios are not used.

TAC Reviewers: The original proposal was to include a trading ratio of 0.2 as a means of demonstrating net environmental gain. [17] Additional proposals were to use this ratio as a baseline requirement to demonstrate this gain. However, with the proposal to move baseline to a performance-based approach (i.e. pounds of TP reduced by field or acre), the ability to demonstrate net environmental gain is more direct, which eliminates the need for a separate trade ratio.

By lowering the uncertainty ratio to 2:1 as a starting point, there is also less reason to provide a variable option to reduce the ratio further. Several TAC members have expressed the rationale that projects that provide direct monitoring should be allowed to reduce or eliminate the need for an uncertainty ratio. However, there is already a strong incentive for directly-monitoring in-stream treatment projects because baseline is set at the current condition.

Idaho Conservation League has stated that given the limited experience of water quality trading, they are not comfortable with a trading ratio of less than 2:1.

[16] The BMP-specific uncertainty ratios included in the original Lower Boise Trading Framework (DEQ, 2010a) and discussed by The Freshwater Trust (TFT, 2015) are incorporated into and covered by this 2:1 uncertainty multiplier. As such, BMP-specific uncertainty factors are not applied when calculating credits generated from individual fields.

[17] This value is consistent with the nonpoint source water quality contribution required under the original Lower Boise Trading Framework (DEQ, 2010, Sec 2.2.7)

6. Credit Characteristics

Once a pollutant reduction has been converted into a credit, there are several aspects of that credit that are important to define:

- *Credit life*: The life of a credit is described in Section 2.3 of this Framework, unless otherwise described for a certain project type.
- *Credits can be released when verified*: Most project types will start generating water quality improvements immediately. All credits can be released and used for compliance purposes as soon as these projects (and the relevant baseline requirement) have been implemented and verified as consistent with a project design and management plan (Section 7 of this Framework).
- *No double counting credits*: The environmental benefits generated from a project type on one land area cannot be sold to two different credit buyers to offset two different impacts.
- *Credits are not property rights in the same way land and water rights are.* Similar to a point source's effluent limit, credits are tied to a specific permittee's authorization to discharge. Issuance of a permit to discharge does not convey any property rights of any sort or exclusive privileges to a point source. Just as EPA and DEQ may need to adjust a point source's effluent limit, credit requirements may also need to be adjusted.
- *Credit Banking:* Credits cannot be banked for use outside of the approved credit life (e.g., a pollutant reduction in 2012 cannot be used to offset a discharge in 2016).
- *Credit Renewal:* Projects can be renewed to generate credits in subsequent compliance cycles so long as they continue to function and are properly maintained (though the reductions may need to be adjusted to reflect the ratios and baseline requirements that apply at that future point in time).

7. Project Implementation and Assurance

All credit-generating projects must be accompanied by a Project Design and Management Plan (Plan), prepared by a qualified individual (e.g., a Professional Engineer, an NRCS certified planner, or an NRCS employee or a certified crop advisor).

Once installed, projects are expected to be maintained in accordance with the Project Design and Management Plan. Adequate land stewardship safeguards such as a project protection agreement, easement and/or stewardship bond must be in place to protect the project from conversion for the duration of the project life.

TAC Reviewers: Additional language may be added here to specify the qualifications for a professional engineer and if NRCS is willing and or able to train staff to develop project design and management plans for projects associated with water quality trading.

8. Process for Generating and Tracking Credits

This section describes the operational process to generate, review, and track credits over time and the parties responsible.

8.1. Site Screening

Site screening is the process of assessing a potential credit generating project and its site to determine initial eligibility and consistency with baseline requirements as proposed. Site screening does not guarantee the final project will be verified and credits certified. While optional for all projects, it is strongly encouraged that projects go through an initial site screening during the first two years of implementation of this Framework. Basic eligibility criteria for non-point source project types are listed in Section 3.2 of the Framework. Project developers should also reference Appendix A for project types approved for credit generation. Initial project screening can be conducted by a DEQ designated third party verification entity or by the project developer. Documentation needed for initial project screening includes:

- Draft project design and management plan;
- Draft proof of ownership/rights to credits;
- Documentation of the project meeting applicable baseline requirements; and
- Summary of project eligibility relative to requirements in this Framework.

Complete information is required for accurate evaluation of project eligibility. A positive screen result represents only a preliminary determination of the project's eligibility to generate credits. The type, quantity, and final approval of credits are confirmed in later phases of the credit cycle. Where a project does not receive a positive screen result, a justification and suggestion for remedy will be provided.

TAC Reviewers/DEQ: At the April TAC meeting it was discussed that a project developer could complete a self-screening as the process is voluntary. Since the process involves a determination of eligibility, you may consider developing a standardized form that can then be submitted along with the supporting documentation to DEQ (or third party) for review and "desk" verification.

8.2. Initial Verification

All credit generating projects must be verified prior to credits being issued. For new credit generating projects, verification must occur within one year of installation. For those pre-existing projects implemented after the base year, but prior to the current date of this Framework (i.e., between 2012 and 2016), verification must occur within one year of the intended credit sale. EPA and/or DEQ maintains the regulatory oversight for project review, but will designate an independent third party to complete initial verification.

8.2.1. Administrative Review

The administrative review will confirm the project's eligibility and ensure that all necessary documentation has been submitted and is accurate. The administrative review process may be expedited if an initial site screening was completed. Table 8.2.1 lists the documents required for submission to the verifier for all non-point source project types.

TABLE 8.2.1. INITIAL VERIFICATION DOCUMENTS

Required documents for initial verification
Site screening notice of eligibility (optional)
Project design and management plan
Proof of ownership/rights to credits
Land protection documents (if applicable)
Permits or other agencies approvals (if applicable)
Map(s) identifying project property boundary, project location and location within trading area
Initial project design
As-built project design
Project monitoring plan
Project stewardship plan
Public funding contracts/agreements (if applicable)

TAC Reviewers: Language was added to the initial verification section to create consistency with State Guidance, which requires verification to occur within one year of implementation. But we clarified an exception for projects implemented between 2012-2016.

8.2.2. Technical Review

A technical review will be conducted to ensure that quantification of credits is complete, accurate, and supported by the necessary documentation. Table 8.2.2 provides the list of documents that should be submitted to support completion of the technical review.

TABLE 8.2.2. TECHNICAL REVIEW DOCUMENTATION

Required documentation for technical review
As-built project design
Pre-project condition documentation (may include cropping and irrigation reports, soil condition assessments, etc.)
Credit calculation/modeling report

For non-point project types utilizing the SISL model to quantify credits, refer to Appendix B for modeling procedures.

For projects utilizing direct measurement, project developers should submit pre and post project monitoring data, consistent with the project's management monitoring plan.

For point sources, pollutant load reductions proposed for credit verification should be consistent with the trading plan.

8.2.3. Project Implementation

Confirmation that the project was installed (via a site visit or other means) consistent with approved eligibility, design and construction criteria for that project type, and that baseline requirements have been satisfied.

For point sources, project verification may include on-site review of NPDES permitted facilities if credits are the result of facility upgrades. Proposed point source credit project plans will be reviewed by DEQ and EPA as part of the procedures of the associated NPDES permit.

8.3. Ongoing Verification

Ongoing verification will occur on a cycle described for each project type, and will be completed by the same verification entity responsible for initial verification. Visual inspection will be completed annually to verify the project is still in place and operating as designed. In addition, EPA, DEQ, or DEQ's designee, may visit the project sites to verify the documentation of the project design, maintenance, and monitoring performance. NPDES permit holders who purchased nonpoint source-generated credits

remain responsible for ensuring BMPs are properly implemented and the correct credit quantification is completed.

TAC Reviewers: The above language is in response to previous comments received. Ultimately through the permit compliance process the permit holder is responsible for ensuring that credits are real and valid. However, as discussed in the 6/16 meeting these risks and associated costs are often negotiated between project developer and the buyer through assurance instruments, such as easements, bonds, or stewardship funds.

The framework does not currently spell out specific requirements for projects, but could. By not including these requirements buyers and sellers have greater flexibility in deciding how to share risk and associated costs.

Section 7.5 of the National Network on Water Quality Trading talks about project protection and stewardship requirements in more detail.

8.4. Credit Issuance and Registry

After initial verification, and when credits are ready to be issued, the verification entity will certify that all aspects of the projects are in place and provide a certification of the pollution reduction credit to DEQ, or DEQ's designee, to register the credits into its trade registry.

Trading parties must generate and maintain records, which may include the project's verification report, certification, and other relevant information needed to register credits. Records shall be maintained in accordance with applicable record retention policies and requirements.

8.5. Trade-Tracking Database

DEQ or a DEQ designated entity is responsible for tracking trades and the day-to-day oversight of trading. All trade transactions must be entered into a single trade-tracking database. Use of a single trade-tracking database for the Lower Boise River trading area ensures:

- Credits are not used more than once;
- All credits meet the same verification standards prior to being registered and sold;
- Trading activity (e.g., account balances, transaction records) can be readily tracked; and
- DEQ and public can easily review trading programs.

It is the responsibility of the seller to register the certified credits and to notify DEQ or its designee when the transaction has been completed and credits are to be transferred to the buyer. Once credits have been transferred, it is the responsibility of the credit buyer to maintain all necessary records and inform DEQ or its designee of any changes to the certified credits.

8.6. Reporting and Reporting Forms

The permittee will need to provide all credit transaction information as part of their Discharge Monitoring Report and Annual Report associated with any trading activity.

8.6.1. Discharge Monitoring Reports

When a point source discharger reports its actual average monthly effluent discharge, it will need to include any credits purchased or sold for that period, and its adjusted discharge (the actual discharge plus or minus any credits traded). Trading activity must be summarized for EPA/DEQ in the Discharge Monitoring Report (DMR) for that period.

A permittee can demonstrate compliance for any exceedance of a permit limit by demonstrating that the exceedance is appropriately offset by the amount of purchased credits minus any credits sold.

8.6.2. Annual Report

The discharger must also submit an annual report to EPA and DEQ detailing all trade activity for the reporting period as well as performance of the associated credit generating projects. The credit adjustments shown on the DMRs must match the credit totals shown in the Annual Report.

9. Compliance and Enforcement

9.1. Permittee Compliance

Permittee compliance is demonstrated through submission of DMRs and annual reports, which shall include documentation that it has secured and continues to hold an adequate credit balance to meet its established effluent limits. The DMRs, annual reports, and other available evidence will provide a basis for EPA and/or DEQ compliance determinations. A point source that relies on trading to comply with permit requirements is responsible for assuring the availability, adequacy and validity of any credit and assumes any compliance risk or uncertainty associated with the trade. The unavailability, inadequacy, invalidity or other deficiency of any credit relied on by a point source is not a defense to permit noncompliance. Enforcement of the trading program as detailed in this Framework shall be consistent with EPA and DEQ enforcement policies and guidance.

9.2. Project Compliance

For projects that materially fail to meet performance standards during ongoing project review, credits will be suspended until corrective action are taken and verified by DEQ or a DEQ-designee. For projects where corrective action is not taken, then the project and all associated credits will be canceled.

TAC Reviewers: WQT programs typically have a specified period in which corrective actions must be taken before credits or projects can be reinstated. This period is likely dependent on the project type. For example if the project includes vegetative planting that fails to grow or are damaged by natural events, an appropriate period would be the time it would take for re-vegetation to meet design standards.

10. Program Improvement and Tracking

Adaptive management is a systematic approach for improving this Framework, with an emphasis on learning about management outcomes and incorporating what is learned into ongoing management (feedback loop). Adaptive management includes processes to improve the elements of trading guidance, frameworks, or plans with new information over time and may focus on improving program operations, trade administration, quantification methods, and overall effectiveness. Overall, the Boise River Watershed Advisory Group (WAG) and DEQ will oversee adaptive management of this framework.

10.1. Adding New Project Types and/or Quantification Method

A list of approved on-farm BMPs for this Framework can be found in Appendix A. This list sets out which project types are currently recommended for trading in this trading area.

New creditable project types may be developed and added to the Lower Boise Trading Framework by following the steps outlined in Table 10.1 Project type revisions may be triggered by monitoring results or any other monitoring of the project type's overall effectiveness and impact on other environmental parameters, as well as through research of the project type's performance on other sites.

TAC Reviewers: This is a skeleton process that follows the current State Guidance on approving new types of BMP and Quantification Methods (Chapter 7). Process outlined in Table 10.1 assumes that ISWCC is active and will continue to play a role in approving new on-farm BMP types.

Table 10.1. Adding new, creditable nonpoint source project types

Process Step	On-Farm Projects
Step 1: Prepare and Submit Proposed Project Type Package	New practices, existing practices already on the Idaho Agriculture Pollution Abatement Plan[18] (APAP) list (ISWCC-DEQ 2015), or improved design, measurement, or calculation methods to BMPs already on a DEQ-approved BMP list may be nominated by anyone for inclusion on a trading framework's BMP list. Each proposed BMP nomination package must contain a description of the BMP and how it works; where the BMP should be applied (e.g., appropriate site conditions); potential side effects and ancillary benefits; monitoring requirements; design, installation, operation, and maintenance requirements; a method for quantifying credits, including any appropriate BMP efficiency or uncertainty ratio; and substantiating information (e.g., background and technical documentation, protocol for applying the method, estimation of method accuracy, sensitivity, and uncertainty). The proposed BMP package must be submitted to DEQ or its designee.
Step 2: Initial Screening of Project Type Proposal	DEQ or its designee will perform an initial screening of the package for completeness. DEQ then forwards complete packages for review by Idaho's BMP technical committee, which is comprised of NRCS, DEQ, ISWCC, and other agencies and administered by ISWCC. Additional technical experts may be engaged to review any proposed quantification methods. The BMP committee only reviews nonpoint source BMPs.
Step 3: Review Process and Criteria for Project Type Consideration	The BMP technical committee will review the package. If the proposed BMP is already included in the APAP, the committee will only review the water quality trading portion of the BMP package and related supporting documentation for its consideration on the trading framework BMP list. If the BMP is not included in APAP, the BMP technical committee can reject, or proceed to add it to the water quality trading BMP list if it is found acceptable. If the proposed BMP involves new technology or methods for which data and experience are insufficient to support credit quantification, the

[18] The Idaho Agriculture Pollution Abatement Plan is Idaho's response to CWA §208 (PL 92-500), detailing how agricultural nonpoint source pollution must be managed. This plan includes a list of nonpoint source BMPs that can be used in Idaho to achieve water quality benefits.

	BMP will initially be approved only if the BMP can be directly measured and if the monitoring is scientifically credible. If the practice's measurements are too variable based on type of crop planted or field size, it may only be allowed using modeling or BMP efficiency rates. Once approved by the BMP technical committee, proposed BMPs will be presented to the Lower Boise River Watershed Advisory Group for approval to be added to the list of acceptable BMP types for the trading framework.
Step 4: DEQ Concurrence, Public Notice and Comment	If the BMP technical committee recommends the BMP, it is forwarded to DEQ to conduct a public notice and comment period. Comments will be limited to the new BMP and not to the program or the list of BMPs that have already been approved for that trading framework or plan.
Step 5: Final Decision/Addition to creditable Project Type List	DEQ may revise the project type based on public comments, in consultation with the technical experts, and issue its final decision. If it is approved, the project type and associated quantification method will then be placed on the appropriate project type lists for a trading framework or plan. Revisions to project types, revisions to a quantification method, or a new quantification method for a project type that has already been approved will follow the same process as for adding a new project type. Project type revisions may be triggered by the monitoring results or any other monitoring of the project type's overall effectiveness and impact on environmental parameters, as well as research of the project type's performance on other sites.

TAC Reviewers: This process is described for on-farm BMP project types only. As there is not currently a standardized design guideline(s) for constructed wetlands and basins at the tributary scale, each project will be reviewed as part of the administrative and technical review process.

Glossary

303(d) List: The list of impaired and threatened waters (stream/river segments, lakes) that the CWA requires all states to submit for U.S. EPA approval every two years on even-numbered years.

401 Certification: As described in 33 U.S.C. § 1341(a)(1), when a federal permit or license applicant plans to undertake any activity (including facility construction or operation) that may result in any discharge into navigable waters, it must obtain a 401 certification. The certification must come from the relevant state and certify that the discharge will comply with select provisions of the CWA.

Active Trading Program: *See* Trading Program.

Adaptive Management: A systematic approach for improving natural resource management, with an emphasis on learning about management outcomes and incorporating what is learned into ongoing management.[19] Adaptive management in water quality trading programs may focus on improving program operations, quantification methods, and overall program effectiveness.

Additionality: In an environmental market, the environmental benefit secured through the payment is deemed additional if it would not have been generated absent the payment provided by the market system.[20]

Alternative to a TMDL Scenario: *See* Total Maximum Daily Load.

Antibacksliding: As defined in CWA sections 303(d)(4) and 402(o) and 40 C.F.R. § 122.44(l), unless falling under a relevant exception, a reissued permit must be as stringent as the previous permit.[21]

Antidegradation: As defined in 40 C.F.R. § 131.12 and relevant state rules and implementation guidelines, these policies ensure protection of existing uses and of water quality for a particular waterbody where the water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. Antidegradation also includes special protection of waters designated as outstanding national resource waters. Antidegradation plans are adopted by each state to minimize adverse effects on water.[22] *See also* Tier 2 Antidegradation Review.

Attenuation (pollutant): The change in pollutant quantity as it moves between two points, such as from a point upstream to a point downstream.

Baseline (Trading): The combined pollutant load and/or BMP installation requirements that must be met prior to trading. At a minimum, all individual nonpoint sources must meet existing state, local, and tribal regulatory requirements. Where a TMDL exists and it establishes, through the TMDL and/or the TMDL implementation plans, requirements that differ from existing state, local, and tribal requirements, then the requirements stemming from TMDL LAs and/or TMDL implementation plans will supplement the existing regulatory requirements.

Base Year: The date after which implemented BMPs become eligible to generate credits.

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[19] *See* Byron K. Williams, Robert C. Szaro, & Carl D. Shapiro, *Adaptive Management: The U.S. Department of the Interior Technical Guide*, pp. v & 1 (U.S. Department of Interior, 2009), *available at* http://www.usgs.gov/sdc/doc/DOI-%20Adaptive%20ManagementTechGuide.pdf.

[20] Willamette Partnership ECAS 2013, *supra* note 198, at p. 48 in Appendix B.

[21] *See* 2007 U.S. EPA Toolkit for Permit Writers, *supra* note 21, at p. Glossary-1 in Glossary.

[22] *See id.* at p. Glossary-2 in Glossary.

Best Management Practices (BMP): BMPs include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during, and after pollution-producing management activities to reduce or eliminate the introduction of pollutants into receiving waters.[23] BMPs can consist of land management practices and in-stream improvements (e.g., in-stream restoration actions or in-stream flow augmentation).

BMP Guidelines: A document that defines: A) an approved quantification method, B) the appropriate pre-project site condition to use for calculating the reduction, C) installation and maintenance quality standards, and D) ongoing performance standards to ensure that each BMP is consistently achieving the desired water quality improvements.

Buyers: Buyers of credits include any public or private entity that chooses to invest in water quality credits and other similarly quantified conservation outcomes. Buyers typically buy credits to meet a regulatory obligation. Eligibility criteria for buyers are described in Section 3.1.

Calibration (modeling): Adjustment of model parameters to better match local conditions, ideally using measured water quality data and BMP site performance metrics representative of the geographic area in which the model will be applied.

Clean Water Act (CWA): 33 U.S.C. § 1251 et seq.

Certification: The formal application and approval process of the credits generated from a BMP. Certification occurs after project review and is the last step before credits can be used toward a compliance obligation.

Compliance Obligation: The total number of credits that a regulated entity must hold in its compliance ledger at particular points in time. In the case of NPDES permittees, this obligation is based on a calculation as to the facility's exceedance over its effluent limit, as adjusted by trading ratio(s) (and where applicable, other policy obligations, such as a reserve pool requirement).

Compliance Schedule: As defined in 33 U.S.C. § 1362(17) and 40 C.F.R. § 122.47, a compliance schedule is a schedule of remedial measures included in a permit or an enforcement order, including a sequence of interim requirements (e.g., actions, operations, or milestone events) that lead a permittee to compliance with the Clean Water Act and regulations.[24]

Credit: A measured or estimated unit of pollutant reduction per unit of time at a specified location,[25] as adjusted by attenuation/delivery factors, trading ratios, reserve requirements, and baseline requirements.

Credit Life: The period from the date a credit becomes usable as an offset by a permittee (i.e., its "effective" date), to the date that the credit is no longer valid (i.e., its "expiration" date).

Critical Period: The period(s) during which hydrologic, temperature, environmental, flow, and other conditions result in a waterbody experiencing critical conditions with respect to an identified impairment.

Delivery Ratio: *See* Trading Ratio (Delivery).

Designee: A person or entity who has been officially chosen to do something or serve a particular role.

Direct Monitoring: *See* Quantification Method (Direct Monitoring).

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[23] 2007 U.S. EPA Toolkit for Permit Writers, *supra* note 21, at p. Glossary-2 in Glossary.

[24] *Id*.

[25] *See* 2007 U.S. EPA Toolkit for Permit Writers, *supra* note 21, at p. Glossary-2 in Glossary.

Discharge Monitoring Report: A periodic water pollution report prepared by point sources discharging to surface waters of the United States and the various states. Point sources collect wastewater samples, conduct chemical and/or biological tests of the samples, and submit reports to a state agency or the U.S. EPA.

Discharge Point: The point at which a point source adds/discharges a pollutant (as defined in 33 U.S.C. § 1362(6)) into a navigable water (as defined in 33 U.S.C. § 1362(7)). A discharge of a pollutant is defined in 33 U.S.C. § 1362(12).

Effectiveness Monitoring: Systematic data collection and analysis to determine progress of a given water quality trading program (or other implementation strategies) toward the achievement of water quality standards or other program goals. Effectiveness monitoring provides the basis for adaptive management.

Effluent Limit: As defined in 33 U.S.C. § 1362(11), an effluent limit means any restriction established by a state or U.S. EPA on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance. *See also* Water Quality-Based Effluent Limitation (WQBEL), and Technology-Based Effluent Limit (TBEL).

Equivalency Ratio: *See* Trading Ratio (Equivalency).

Exceedance: The difference between a facility's load discharge and its effluent limit.

Ledger: A service or software that provides a ledge function for tracking credit quantities and ownership; accounting summaries that cover primarily transactional information. *See also* Registry.

Load Allocation (LA): As defined in 40 C.F.R. § 130.2(g), this is the portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loads should be distinguished.

Localized Impact: A localized concentration of pollution that causes a violation of water quality standards at a particular location. In assessing potential near-field impacts, agencies should also consider whether trading will comply with the Endangered Species Act and other species and habitat protection laws; and whether or not near-field discharges addressed through trading will degrade groundwater in violation of any applicable state water quality regulations.

Location Ratios: *See* Trading Ratio (Delivery).

Look-Back Period: The time period preceding the implementation of a permittee's trading plan during which landowners may take credit for installed BMPs. A look-back period is intended to adjust for a market failure that disincentivizes early action by landowners.

Modeling: *See* Quantification Method (Modeling).

Municipal Separate Storm Sewer System (MS4) Permit: A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created to or pursuant to state law) including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States. (ii) Designed or used for collecting or conveying

stormwater; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2 (As defined in 40 CFR 122.26(b)(8)).

National Pollutant Discharge Elimination System (NPDES) Permit: As defined in 33 U.S.C. § 1342.

Near-Field Impact: *See* Localized Impact.

Nonpoint Source: Diffuse sources of water pollution, such as stormwater and nutrient runoff from agriculture or forest lands. *See* 40 C.F.R. § 35.1605-4. U.S. EPA guidance describes a nonpoint source as "includ[ing] pollution caused by rainfall or snowmelt moving over and through the ground and carrying natural and human-made pollutants into lakes, rivers, streams, wetlands, estuaries, other coastal waters and ground water. Atmospheric deposition and hydrologic modification are also sources of nonpoint pollution."[26]

Nutrient Management Plan: Plan developed for a specific agriculture operation that outlines principles and practices for managing the amount (rate), source, placement (method of application), and timing of plant nutrients and soil amendments.[27]

Offset(s): 1) *(noun)* Offsite treatment implemented by a regulated point source outside of a trading framework 2) *(verb)* to compensate for.[28]

Permittee: Any entity with a discharge approved or pending approval under state- or federally-issued permit (e.g., NPDES permit). This document focuses on point source permittees seeking or granted permission to purchase water quality credits as a means of permit compliance.

Point of Concern: The point at which the greatest deviations from a particular water quality standard occurs, as identified through appropriate watershed-wide modeling (usually in a TMDL).

Point Source: As defined in 33 U.S.C. § 1362(14), this means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

Post-Project Performance: The estimated or measured pollution load associated with the post-project site conditions.

Post-Project Site Conditions: The necessary data to quantify post-project water quality benefit through an assessment of actual or anticipated site conditions after project installation. Post-project site conditions may be assessed via a site visit and/or interpretation of remote data.

Post-TMDL Scenario: *See* Total Maximum Daily Load.

Pre-Project Site Assessment: The process of developing and documenting the information necessary to input the needed data into water quality benefit quantification methods. This may include a site visit and/or interpretation of remote data. A pre-project site assessment includes, at the least, an assessment of pre-project conditions and an assessment of anticipated post-project conditions.

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[26] U.S. Environmental Protection Agency, *Nonpoint Source Program and Grants Guidelines for States and Territories*, p. 7, note 2 (2013), *available at* http://water.epa.gov/polwaste/nps/upload/319-guidelines-fy14.pdf.

[27] *See* Natural Resources Conservation Service, *Conservation Practice Standard: Nutrient Management, Code 590*, pp. 6-7 (2012), *available at* http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1046896.pdf.

[28] 2007 U.S. EPA Toolkit for Permit Writers, *supra* note 21, at p. Glossary-4 in Glossary.

Pre-Project Performance: The estimated or measured pollution load associated with the pre-project site conditions.

Pre-Project Site Conditions: The necessary data to quantify pre-project water quality benefit through an assessment of site conditions prior to project installation. Pre-project site conditions may be assessed via a site visit and/or interpretation of remote data.

Pre-TMDL Scenario: *See* Total Maximum Daily Load.

Program Administrator: The organization responsible for the operation and maintenance of a water quality trading program. Specific responsibilities of a program administrator may include: defining credit calculation methodologies, protocols, and quality standards; project review; and credit registration.[29]

Project: One or more BMPs or other activities, that, taken together, are proposed for generating credits on a single site.

Project Design and Management Plan (Operation and Maintenance Plan): The document that details A) how the proposed credit-generating actions will be designed and installed to meet BMP guidelines, including a description of the proposed actions, installation practices, anticipated timelines, restoration goals, and anticipated threats to project performance; and B) how the project developer plans to maintain/steward the practice or action for the duration of the project life, keep the practice or action consistent with BMP guidelines, and report on that progress.

Project Developer: Any entity that develops credits, whether that entity is the permittee, a contractor of the permittee that develops or aggregates credits, or a landowner developing credits on a permittee's behalf.

Project Life: The period of time over which a given BMP is expected to generate credits. Typically, the project life is also the minimum project protection period.

Project Protection Agreements: The enforceable agreements to protect BMPs at the project site, which may include leases, contracts, easements, or other agreements. Project protection agreements must cover the credit life and should run with the land to ensure the project will not be affected if ownership changes. *Ideally, these protections will also mitigate against proximate disturbing land use activities.*

Project Protection Period: The duration of the project protection agreement, which at a minimum must cover the credit life.

Project Review: The process of confirming that a credit-generating project has completed certain elements that should help ensure the project provides the water quality benefits it promises. Specifically, confirmation that project site BMPs or credit-generating activities and credits conform to the applicable quality standards required by a program administrator or regulator. This process includes: (1) an administrative review for the completeness and correctness of documentation; (2) technical review for the completeness and accuracy of quantification; and (3) confirmation of project implementation and/or performance.

Project Review (Initial): The first project review, usually in the first year of project implementation.

Project Review (On-going): Project reviews in subsequent years of the project life.

Project Review Entity: A state regulatory body, a qualified third party, or a permittee that performs the project review function.

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[29] *See* Willamette Partnership ECAS 2013, *supra* note 198, at p. 8.

Project Review Plan: The portion of a permittee's trading plan that describes the proposed methods of project review, what information is reviewed and when, who conducts project review, qualification requirements for project reviewers, and the project reviewer's protections against conflicts of interest. The project review plan should also clarify whether and when on-site inspection should occur.

Project Review Protocol: The document that provides the standardized, specific guidance on the review and assessment of credit-generating actions and BMPs and credit calculation methodologies under a water quality trading program.

Project Site (Project or Site): The location at which BMPs are undertaken or installed.

Project Site Screening (Site Screening or Site Validation): The initial site screening process through which a project developers receive confirmation that their proposed projects are likely eligible to produce credits, based on the information available at that time.

Protocols: Step-by-step manuals and guidelines for achieving particular environmental outcomes. Protocols include the actions, sequencing, and documentation necessary to generate credits from eligible BMPs.

Public Conservation Funds: *See* Public Funds Dedicated to Conservation.

Public Funds Dedicated to Conservation: Funding targeted to support voluntary natural resource protection and/or restoration with a primary purpose of achieving a net ecological benefit through creating, restoring, enhancing, or preserving habitats.[30] Examples include Farm Bill Conservation Title cost share and easement programs, U.S. EPA section 319 grant funds, U.S. Fish and Wildlife Service Partners for Wildlife Program, and state wildlife grants. Public loans intended to be used for capital improvements of public wastewater and drinking water systems (e.g., State Clean Water Revolving Funds and USDA Rural Development Funds), bond-backed public financing, and utility stormwater and surface water management fees from ratepayers, are not public funds dedicated to conservation.[31] Public funds dedicated to conservation are often referred to as "cost share" and/or "matching funds."

Quality Standards (BMP): The necessary specifications associated with a particular credit-generating activity or BMP that ensures that the estimated ecosystem service benefits at a project site are actually achieved through implementation.

Quantification Method: Scientifically-based method for determining the load reduction associated with a given credit-generating activity or BMP. Quantification methods can be grouped into three general types: pre-determined rates/ratios, modeling, and direct monitoring.

Quantification Method (Pre-Determined Pollution Reduction Rates): Standard modeled values based on the best available science that is used to calculate water quality improvement.

Quantification Method (Modeling): Mathematical and/or statistical representation of processes driving changes in water quality, based in science, used to estimate the water quality benefits provided by the credit-generating activities. Modeling is also frequently used to predict attenuation of pollutants.

Quantification Method (Direct Monitoring): Sampling and analysis of both water chemistry (e.g., river turbidity or temperature) and surrogates for water quality (e.g., eroding stream banks or shade from riparian vegetation) used to measure the realized water quality benefits of BMPs and credit-generating activities.

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[30] *See* Oregon Interagency Recommendations on Public Funds, *supra* note 204.

[31] *See* Willamette Partnership ECAS 2013, *supra* note 198, at p. 15.

Registration (of Credits): The process of assigning a unique serial number to a verified and certified credit, and uploading the credit (and accompanying documentation) to a publicly available website.

Registry: *See* Ledger. A ledger that includes more project-specific information. Credit registries may act as a mechanism for public disclosure of trading project documentation.

Report (Annual Compliance): Annual reports that aggregate the details of individual site performance reports into a comprehensive summary of overall trading plan performance. These reports may be required as special conditions in permits.

Reserve Ratio: *See* Trading Ratio (Reserve).

Retirement Ratio: *See* Trading Ratio (Retirement).

Site Conditions (Post-Project): The characteristics and conditions of the project site that are measured or are anticipated to be present after the implementation of a BMP or action and assuming the project site continues to be managed as planned.

Site Conditions (Pre-Project): A description or measurement of site conditions prior to implementation of the BMP action, used to calculate the current input level of a pollutant (in default unit of trade) from the project site into the waterbody.[32]

Site Performance (Post-Project): The pollutant load (measured or anticipated) that will enter a waterway, as calculated by the relevant quantification method's interpretation of post-project conditions.

Site Performance (Pre-Project): The modeled pollutant load that is entering a waterway, as estimated by the relevant quantification method, from a site prior to installing a BMP or action.

Site Screening: *See* Project Site Screening.

Site Validation: *See* Project Site Screening.

Stewardship Funds: The funding necessary to maintain project sites for the duration of the credit life. Project developers must demonstrate adequate stewardship funding is in place before credits can be verified. Stewardship funding instruments often include performance bonds, restricted accounts, insurance, or other similar documentation.

Technology-Based Effluent Limit (TBEL): As described in 33 U.S.C. § 1311(b)(1)(A)-(B), a permit limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration. TBELs for publicly owned treatment works (POTWs) are derived from the secondary treatment regulations (40 C.F.R. Part 133) or state treatment standards. TBELs for non-POTWs are derived from national effluent limitation guidelines, state treatment standards, or on a case-by-case basis from the best professional judgment of the permit writer.[33]

Tier 2 Antidegradation Review: As part of a Tier 2 Antidegradation program, States and Tribes can identify procedures that must be followed and questions that must be answered before a reduction in water quality can be allowed to "high quality" waters—water bodies where existing conditions are better than necessary to support CWA § 101(a)(2) "fishable/swimmable" uses. In no case may water quality be lowered to a level which would interfere with existing or designated uses.

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[32] *See* Willamette Partnership ECAS 2013, *supra* note 198, at p. 50 in Appendix B.

[33] *See* 2007 U.S. EPA Toolkit for Permit Writers, *supra* note 21, at p. 27.

Total Maximum Daily Load (TMDL): As defined in 33 U.S.C. § 1313(d)(1)(C), and 40 C.F.R. § 130.2(i), as well as in relevant state regulations. A TMDL is the calculation of the maximum amount of a pollutant a waterbody can receive and still meet applicable water quality standards (accounting for seasonal variations and a margin of safety), including an allocation of pollutant loadings to point sources (waste load allocations (WLAs)) and nonpoint sources (load allocations (LAs)).[34]

- **Alternative to a TMDL Scenario**: A regulatory environment in which a state uses alternative pollution control requirements instead of implementing a TMDL. Under this alternative, states must provide adequate documentation that the required control mechanisms will address all major pollutant sources and establish a clear link between the control mechanisms and water quality standards (e.g., a 4b rule).[35] A state may provide for the use of water quality trading in a 4b watershed plan or strategy.
- **Pre-TMDL Scenario**: A regulatory environment in which a waterbody has been listed as impaired but is not yet covered by an approved TMDL.
- **Post-TMDL Scenario**: A regulatory environment in which a TMDL serves as the primary structure and driver for a trading framework or plan. NPDES permits are written to meet the assumptions of the TMDL WLA, and the resulting WQBEL serves as the immediate driver for a trade. States may also have additional requirements surrounding trading in the context of a TMDL.

TMDL Implementation Plans: The management plans designed to implement the waste load and load allocations assigned to entities in the TMDL. In some states, a TMDL implementation plan is required in order to translate LAs into baseline requirements.

Toxics (persistent bio-accumulative): Persistent bio-accumulative toxics (PBTs). PBTs are chemicals that are toxic, persist in the environment and bioaccumulate in food chains and, thus, pose risks to human health and ecosystems. PBTs include aldrin/dieldrin, benzo(a)pyrene, chlordane, DDT and its metabolites, hexachlorobenzene, alkyl-lead, mercury and its compounds, mirex, octachlorostyrene, PCBs, dioxins and furans, and toxaphene.[36]

Tracking: The process of following the status and ownership of credits as they are issued, used, retired, suspended, or cancelled.

Trading Area: A geographic area within which credits can be bought and sold. A trading area should be defined ecologically where a pollution reduction in one part of a watershed can be linked to a water quality improvement at a point of compliance. Trading areas can also be defined to reduce the risk of localized water quality impairments or localized impacts.

Trading Baseline: *See* Baseline (Trading).

Trading Guidance: A state's statute, rule, policy, guidance, or other documents articulating how WQT should occur within that state.

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[34] See *id.,* at p. Glossary-5 in Glossary.

[35] *See* 2006 Integrated Reporting Guidance, *supra* note 63, at pp. 53-56.

[36] *See* U.S. Environmental Protection Agency, *Multimedia Strategy for Priority Persistent, Bioaccumulative, and Toxic (PBT) Chemicals*, (2011), *available at* http://www.epa.gov/pbt/pubs/fact.htm. Notable PBTs are prioritized by EPA's Canada-United States Binational Toxics Strategy. *Id*. *See also* 2003 U.S. EPA Trading Policy, *supra* note 2, at p. 1610 (EPA did not originally support trading of persistent bioaccumulative toxics).

Trading Framework: Watershed-level documents that contain details of trading processes and standards.

Trading Plan: Permittee-level trading details; the specific incorporation of trading elements into a permit or other binding agreement. A permittee's trading plan may incorporate the terms of relevant state-wide trading guidance or a watershed trading framework by reference, or it may include all specific details within the permit itself.

Trading Program: The general term used to describe the approach to trading taken by a state agency and/or WQT stakeholders; the full range of policies supported by a state. Active trading programs have completed approved program designs and/or have completed transactions.

Trading Ratio: A trading ratio is a numeric value used to adjust available credits for a seller or credit obligation of a buyer based on various forms of risk and uncertainty. Ratios are applied to account for various factors, such as watershed processes (e.g., attenuation), risk, and uncertainty— both in terms of measurement error and project performance, ensuring net environmental benefit, and/or ensuring equivalency across types of pollutants.

Trading Ratio (Delivery): The factor applied to pollutant reduction credits when sources are directly discharging to a waterbody of concern that accounts for the distance and unique watershed features (e.g., hydrologic conditions) that will affect pollutant fate and transport between trading partners.[37]

Trading Ratio (Equivalency): The factor applied to pollutant reduction credits to adjust for trading different pollutants or different forms of the same pollutant.[38]

Trading Ratio (Retirement): The factor applied to pollutant reduction credits to accelerate water quality improvement. The ratio indicates the proportion of credits that must be purchased in addition to the credits needed to meet regulatory obligations. These excess credits are taken out of circulation (retired) to accelerate water quality improvement.[39]

Trading Ratio (Reserve): A type of uncertainty ratio in which credits are held in "reserve" and then used to account for uncertainty and offset failures in project performance.

Trading Ratio (Uncertainty): The factor applied to pollutant reduction credits generated by nonpoint sources that accounts for lack of information and risk associated with BMP measurement, implementation, and performance.[40]

True-Up Period: NPDES permits with trading can include provisions that allow buyers a window of time at the end of the compliance period to purchase needed credits. Because a facility may not know year-to-year the exact amount of credits needed for compliance, a true-up period can reduce risk to regulated sources of overbuying or under buying credits in any given year. May also be referred to as a "reconciliation period".

Uncertainty Ratio: *See* Trading Ratio (Uncertainty).

Units of Trade: The quantity of tradable pollutants, typically expressed in terms of pollutant load per unit time, at a specified location (e.g., lbs/year at the point of concern).

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[37] *See* 2007 U.S. EPA Toolkit for Permit Writers, *supra* note 21, at p. Glossary-3 in Glossary.

[38] *See id*.

[39] *See id.*, at p. Glossary-5 in Glossary.

[40] *See id.,* at p. Glossary-6 in Glossary.

Validation (Model): An iterative process through which to test the capabilities of a calibrated model to reproduce system behavior within acceptable bounds; the process through which results from credit quantification methods are assessed relative to evaluation criteria. Often, validation includes the comparison of model results with measured data, sensitivity analyses, and uncertainty analyses. Validation may also include a comparision with other model outputs, literature values, and/or expert judgement.

Variance: As authorized by 40 C.F.R. § 131.13 and implemented according to state law, a variance is a time-limited change in the water quality standards for a particular regulated entity, typically limited to three-to five-year duration, with renewals possible.

Verification: *See* Project Review.

Waste Load Allocation (WLA): As defined in 40 C.F.R. § 130.2(h), this is the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality-based effluent limitation.

Wastewater Treatment Plant (WWTP): *see* Publicly Owned Treatment Works, but is not necessarily publicly owned.

Water Quality Benefit: The environmental improvement directly attributable to BMPs installed at a site. Determining water quality benefit is the first step in determining the credits available for sale (it must be reduced by applicable attenuation or modeling factors, baseline factors, or ratios). One way water quality benefit may be calculated is by subtracting the modeled post-project performance from the modeled pre-project performance.

Water Quality Criteria: As defined in 40 C.F.R. § 131.3, water quality criteria are elements of state water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use.

Water Quality Standard: As defined in 40 C.F.R. § 131.3(i), Water quality standards are provisions of state or federal law which consist of a designated use or uses for the waters of the United States and water quality criteria for such waters based on such uses. Water quality standards are to protect the public health or welfare, enhance the quality of water, and serve the purposes of the Clean Water Act.

Water Quality Based-Effluent Limitation (WQBEL): As described in 33 U.S.C. § 1312(a), a WQBEL is an effluent limitation determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, wildlife, translation of narrative criteria) for a specific point source to a specific receiving water for a given pollutant or based on the facility's waste load allocation from a TMDL.

Watershed Plan: A TMDL-like regulatory strategy for managing and improving an impaired waterbody established by regulators before a TMDL is promulgated, or if a TMDL is not otherwise pursued for a watershed.

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Appendix A: Eligible Project Types

The following project types are eligible to generate credits, pending the development of updated BMP quality standards for each on-farm BMP.

Table A1. Eligible Project Types

Project Type	Approved Quantification Method	Pollution Removal Rates	Design Criteria	Lifespan
Point source upgrades	Direct measurement	Measured	Variable	Variable
Constructed wetlands and sediment basins (tributary scale)	Direct measurement	Measured	Variable	Variable
Sediment basins (tributary scale)[41]	SISL	65%	NRCS 350	20 years
BMP Type	**Approved Quantification Method**	**BMP Efficiency Rates[42]**	**Design Criteria**	**Lifespan**
Sediment basin (field scale)	SISL	75%	NRCS 350	20 years
Filter strips	SISL	50%	NRCS 393	1 season
Underground outlet (years 1-2)[43]	SISL	85%	NRCS 620	2 years
Underground outlet (after year 2)	SISL	65%	NRCS 620	18 years
Sprinkler irrigation	SISL	100%	NRCS 442	15 years
Microirrigation	SISL	100%	NRCS 441	10 years
Tailwater recovery	SISL	100%	NRCS 447	15 years
Surge irrigation	SISL	50%	NRCS 449[44]	1 season
Constructed wetland (field scale)	SISL	65%	NRCS 656	15 years
Cover Cropping	SISL	TBD[45]	NRCS 340	1 year
Residue Mgmt (No Till)	SISL	90%	NRCS 329	1 year

[41] Where sediment basins are proposed at a tributary or sub-watershed scale, but direct measurement is not proposed, project developers should follow NRCS design criteria and associated efficiency rate.

[42] These BMP efficiency rates are based on the analysis completed by The Freshwater Trust (TFT, 2015) to update the BMP efficiency rates included in the original Lower Boise Trading Framework (IDEQ, 2010). Unlike the original Lower Boise Trading Framework, the BMP efficiency rates in Table 4.1 do not incorporate BMP-specific uncertainty factors. These have been excluded from the field-level credit calculation process, and are instead incorporated into and covered by the 2:1 uncertainty multiplier (see Section 4.3 of this Framework).

[43] This BMP's effectiveness drops after two years, and so the remaining years of the BMP must be decreased.

[44] NRCS Practice Standard 449 – Irrigation Water Management, includes guidance on a variety of irrigation techniques, including "surge irrigation". Additional information can be found at https://efotg.sc.egov.usda.gov/references/public/ID/449_0312.pdf.

[45] This BMP was not included in the original 2010 Lower Boise Trading Framework. Based on a literature review, The Freshwater Trust suggested a 60% efficiency rate (TFT, 2015). This efficiency rate should be calibrated and tested through pilots prior to incorporation into Table 4.1.

TAC Reviewers: The table presented in this draft varies from what was presented in Water Quality Trading Note VI. As the footnote above elaborates, uncertainty ratios were not included in the efficiency rate here and thus the difference.

Reviewers noted that 85% efficiency rate is high for the constructed wetland BMP and provided additional information to support a 65% recommendation. TFT technical analysis recommended an efficiency rate of 75%. In discussing with staff at TFT, they noted that a high degree of uncertainty exists with on-farm wetlands and felt a lower rate was appropriate.

Several reviewers noted that straw in furrows is not a common practice in the Lower Boise watershed.

Several reviewers noted that while cover crops are an important part of winter time soil retention, it was questioned as an appropriate BMP for addressing irrigation related TP loss. No efficiency rate is currently suggested. Should this be removed from the list?

For Residue Management (No Till) the efficiency rate is based on Dr. Carter's 2002 report. Additional literature review and analysis may be necessary to update. Table A1 does not include Nutrient Management (NRCS 590) because the efficiency of nutrient management is difficult to estimate due to numerous complexities such as the highly site-specific nature of the practice, and the dynamic and responsive nature of the practice (TFT, 2015). Nutrient management is most effective when used in conjunction with other on-field BMPs. Nutrient management is not assigned an efficiency rate, but is instead considered to be a complementary practice that enhances the outcomes of other BMPs when considered as part of a conservation plan.

For instructions on the application of SISL, see Appendix B.

Appendix B. SISL Method for Quantifying Total P Reductions

B1. SISL

The SISL model is an empirical model that was developed and calibrated by the NRCS using over 200 field-years of data from Southern Idaho. The form of the SISL model is similar to that of the Universal Soil Loss Equation (USLE). The model estimates the overall soil loss at the end of a furrow by multiplying a base soil loss value by other adjustment factors to reflect the on-field conditions. The accuracy of the SISL model was confirmed against instream water quality data collected by USGS for Mason Creek (TFT, 2015). The model takes the following form:

$$SISL = BSL \times KA \times PC \times CP \times IP$$

where:

- **Base soil loss (BSL)**: the base soil loss is a function of field slope, field length, crop type, and end of field slope shape (convex end). Embedded within the BSL is the typical irrigation practices (number of irrigations, inflow rate, furrow spacing, irrigation duration, etc.) used for the different crop categories in southern Idaho (Bjorneberg et al., 2007). Base soil loss values for a given field can be determined by locating the value from the below tables corresponding to the correct combination of the following variables: 1) surface irrigation method (gated pipe, siphon tube, or feeder ditch); 2) crop type (permanent cover, close growing, row crop, or intensive row crop); 3) field length (660 feet or 1320 feet); 4) field slope (<1%, 1 – 1.9%, 2 – 2.9%, or > 3%); and 5) end condition (no, moderate or severe convex ends). Examples of specific crops included in each of the four crop type categories are described below.

Crop Type	Field Length (ft)	Base Soil Loss (tons/acre) – Gated Pipe											
		Field Slope											
		<1%			1 to 1.9%			2 to 2.9%			>3%		
		N*	M	S	N	M	S	N	M	S	N	M	S
Permanent cover	660	0.0	0.0	0.0	0.7	0.9	1.3	2.4	3.0	4.3	5.9	7.4	10.3
	1320	0.0	0.0	0.0	0.6	0.7	1.0	1.9	2.4	3.4	4.7	5.9	8.2
Close growing	660	1.2	1.4	1.9	3.4	4.2	4.9	6.7	8.4	11.8	10.9	13.7	19.1
	1320	1.0	1.1	1.5	2.7	3.4	4.7	5.4	6.7	9.4	8.7	11.0	15.3
Row crop	660	2.6	3.3	4.6	9.1	11.4	16.1	19.3	24.2	32.2	29.4	36.8	51.5
	1320	2.1	2.6	3.7	7.3	9.1	12.9	15.4	19.4	25.8	23.5	29.4	41.2
Intensive row crop	660	3.4	4.2	5.9	12.7	16.0	22.3	27.7	34.7	48.5	46.2	57.8	80.9
	1320	2.7	3.4	4.7	10.2	12.8	17.8	22.2	27.8	38.8	37.0	46.2	64.7
* N, M and S refer to none, moderate and severe convex ends.													

Crop Type	Field Length (ft)	Base Soil Loss (tons/acre) – Siphon Tube											
		Field Slope											
		<1%			1 to 1.9%			2 to 2.9%			>3%		
		N*	M	S	N	M	S	N	M	S	N	M	S
Permanent cover	660	0.0	0.0	0.0	0.7	0.9	1.2	2.3	2.9	4.1	5.6	7.0	9.8
	1320	0.0	0.0	0.0	0.6	0.7	1.0	1.8	2.3	3.3	4.5	5.6	7.8
Close	660	1.1	1.3	1.8	3.2	4.0	5.6	6.4	8.0	11.2	10.4	13.0	18.2

growing	1320	0.9	1.0	1.4	2.6	3.2	4.5	5.1	6.4	9.0	8.3	10.4	14.6
Row crop	660	2.5	3.1	4.4	8.7	10.9	15.3	18.4	23.0	32.2	28.0	35.0	49.0
	1320	2.0	2.5	3.5	7.0	8.7	12.2	14.7	18.4	25.8	22.4	28.0	39.2
Intensive row crop	660	3.2	4.0	5.6	12.1	15.2	21.2	26.4	33.0	46.2	44.0	55.0	77.0
	1320	2.6	3.2	4.5	9.7	12.2	17.0	21.1	26.4	37.0	35.2	44.0	61.0
* N, M and S refer to none, moderate and severe convex ends													

		Base Soil Loss (tons/acre) – Feeder Ditch											
		Field Slope											
		<1%			1 to 1.9%			2 to 2.9%			>3%		
Crop Type	**Field Length (ft)**	N*	M	S	N	M	S	N	M	S	N	M	S
Permanent cover	660	0.0	0.0	0.0	0.8	1.0	1.4	2.6	3.3	4.7	6.4	8.1	11.3
	1320	0.0	0.0	0.0	0.6	0.8	1.1	2.1	2.6	3.4	5.1	6.5	9.0
Close growing	660	1.3	1.5	2.1	3.7	4.6	6.4	7.4	9.2	12.9	12.0	15.0	20.9
	1320	1.0	1.2	1.7	3.0	3.7	5.1	5.9	7.4	10.3	9.6	12.0	16.7
Row crop	660	2.9	3.6	5.1	10.0	12.5	17.6	21.2	26.5	32.2	32.2	40.3	56.4
	1320	2.3	2.9	4.1	8.0	10.0	14.1	17.0	21.2	25.8	25.8	32.2	45.1
Intensive row crop	660	3.7	4.6	6.4	13.9	17.5	24.4	30.4	38.0	53.1	50.6	63.3	88.6
	1320	3.0	3.7	5.1	11.1	14.0	19.5	24.3	30.4	42.5	40.5	50.6	70.9
* N, M and S refer to none, moderate and severe convex ends													

CROP TYPE	**Examples**
Permanent Cover	Alfalfa, clover/wildflowers, fallow/idle cropland, grapes, herbs, pasture/grass, pasture/hay
Close Growing	Barley, camelina, canola, flaxseed, hops, oats, rye, safflower, sorghum, sunflower, triticale, wheat
Row Crop	Carrots, corn, dry beans, greens, lettuce, mint, mustard, peas, pumpkins, soybeans, watermelons, peppers
Intensive Row Crop	Onions, potatoes, radishes, sugarbeets, turnips

- **Soil erodibility adjustment factor (KA)**: The soil erodibility adjustment factor is based on the NRCS soil erosion "K" factor from USDA soil surveys. The dominant K factors in the Lower Boise River watershed can be found in Figure 1. Once the K factor is estimated based on the map below, this value is then multiplied by 2.04 to get the adjustment factor, KA, for use in the SISL equation.[46]

K Factor	**KA (after applying 2.04 multiplier)**
0.18	0.37
0.23	0.47
0.26	0.53
0.31	0.63
0.35	0.71
0.39	0.80

Regarding the K-Factor Guides. This table represents the easiest way for someone to estimate the dominant K factor for their field. There are higher resolution maps of K factors with much smaller pixels, but these would be unwieldy for estimating the

[46] The soil erodibility adjustment factor (KA) is based on the soil erosion factor (K factor) from NRCS soil surveys. The KA factor used in the SISL model is the NRCS K factor for the modeled soils, multiplied by 2.04 (NRCS, 2003).

dominant K factor for a given field. Instead, TFT looked at the distribution of K factors in the watershed and split it into 6 clumps. The K factors in the map are essentially the average K factor for those clumps. This approach loses some resolution but gains a lot of usability.

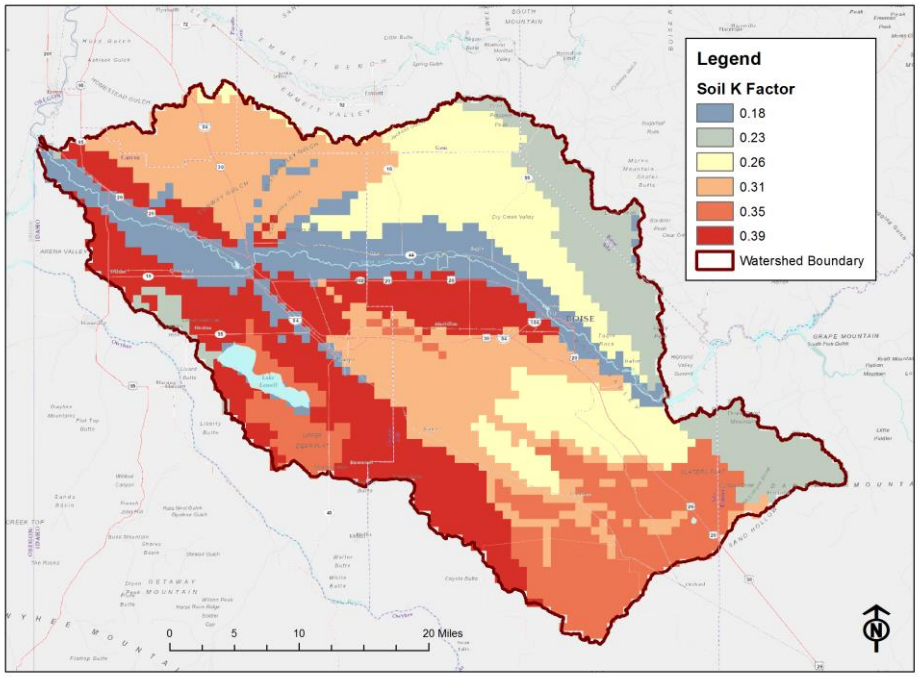

FIGURE 0-1. LOWER BOISE SOIL K FACTOR

- **Prior crop adjustment factor (PC)**: The SISL model includes a prior crop adjustment factor (PC) to account for crop residue from the previous year's crop. High residue crops provide additional resistance to soil erosion.[47]

CROP	PC ADJUSTMENT FACTOR
Pasture	0.65
Alfalfa	0.70
Mint	0.70
Alfalfa Seed	0.75
Small Grain (high residue)	0.75
Corn (high residue)	0.75
Corn silage	0.85
Sugar Beets	1.00
Potatoes	1.00

*PC adjustment factors derived from NRCS 2003 data[48]

[47] USDA crop data (USDA, 2005 and 2007-2014) were used to determine the crop type in the previous year, which informed the selection of the PC adjustment factor for that year.

[48] Need reference from TFT

- **Conservation practice adjustment factor (CP)**: Any variation of conservation practices can be altered through the CP adjustment factor.[49]

CONSERVATION PRACTICE	CP ADJUSTMENT FACTOR*
No conservation practices installed	1.00
Conventional/moldboard tillage	1.00
Residue management (seasonal)	0.20
Residue management (mulch till)	0.15
Residue management (no till)	0.10
Deep tillage	0.50
Alfalfa seed	0.35
Alfalfa hay (more than one year in rotation)	0.20

*CP adjustment factors derived from NRCS 2003 data[50]

- **Irrigation management adjustment factor (IP)**: Typical surface irrigation practices are reflected in the irrigation management adjustment factor (NRCS, 2003). The factor applicable to a particular field will vary depending on the type of irrigation practices being used.

IRRIGATION MANAGEMENT TYPE[51, 52]	IP ADJUSTMENT FACTOR
No irrigation management occurring	1.00
High level irrigation water management w/o cutback	0.90
High level irrigation water management with cutback	0.70
Surge irrigation	0.50

B2. Sediment Loss to Total Phosphorus Conversion Factor

The SISL model calculates the total soil loss currently associated with surface irrigation practices at the relevant field. For every ton of sediment loss modeled at a field, DEQ assumes that two (2) pounds of total phosphorus are attached (IDEQ, 2010; TFT, 2015). Therefore, in calculating total phosphorus credits, multiply the number of tons of soil

[49] Because no information is available to suggest if additional conservation practices are being implemented at any particular field, this Framework should assume that only conventional tillage is being implemented. However, if conservation practice(s) are being implemented, then the appropriate conservation practice adjustment factor should be used.

[50] Need reference from TFT

[51] "High level irrigation water management" is a combination of a variety of irrigation methods and technologies used to improve water application efficiency. Additional information can be found at http://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=nrcseprd323426&ext=pdf.

[52] "Cutback" is the reduction of furrow inflow after the flow has reached the end of the furrow. Surge flow and cablegation are examples of cutback systems.

loss from a field (e.g., 1.5 tons, not 3000 pounds) by two to translate from sediment loss to attached total phosphorus.

TAC Reviewers: Assumptions of the SISL model are based on field sampling and literature review research completed by Dr. D.L. Carter and David Ferguson of the Idaho Soil Conservation Commission in support of the original Lower Boise River Trading Framework.

Ferguson, D.F. 2000a. Estimating an agricultural surface irrigated Cropland sediment and phosphorus loss with average surface irrigation soil loss. Unpublished Technical Report, Idaho Soil Conservation Commission.

Ferguson, D.F. 2000b. Watershed scale and field scale sediment basin phosphorus reduction effectiveness. Unpublished Technical Report, Idaho Soil Conservation Commission.

Carter, D.L. 2002. Proposed Best Management Practices (BMP's) to be Applied in the Lower Boise River Effluent Trading Demonstration Project. Unpublished Technical Report, Idaho Department of Environmental Quality.

B3. BMP Efficiency

Assuming an approved BMP is designed, implemented, monitored, maintained, and tracked according to the quality standards, the total phosphorus reduction potential is calculated by multiplying the total phosphorus loss associated with the field—SISL output in tons soil loss, multiplied by two—by the appropriate "BMP efficiency rate" (see Table 1 in Appendix A).

BMP efficiency rates are not discounted for each field. Instead uncertainty is addressed by multiplying the overall obligation for a credit buyer by a 2:1 (see Section 4.3 of this Framework), uncertainty is only applied to the credit buyer obligation.

B4. BMP Efficiency Rates Where Multiple BMPs are Installed

Table A1 above lists the approved BMP efficiency rates for individual BMPs. If multiple BMPs are installed at a field, then the individual BMP efficiency rates must be discounted to account for redundancy associated with simultaneous application of the two practices. Discount rates were developed acknowledging that phosphorus runoff is likely reduced by implementing multiple BMPs, while reflecting the diminishing returns that are likely to be seen with the employment of each additional BMP.

There are two types of "multiple BMP discount factors." Where the BMPs do not overlap spatially and may interact relatively independently (e.g., cover crop installed on upland and sediment basin installed on edge of field), the BMP efficiency rate of the less efficient BMP is discounted by 11% (TFT, 2015). Where the BMPs are spatially overlapping and therefore are more likely to interact (e.g., conservation tillage and

cover crops both help to reduce sediment loss on a field by maintaining vegetative cover on the soil surface), the BMP efficiency rate of the less efficient BMP is discounted by 20% (TFT, 2015).

The equations below describe how these discount rates are applied in the calculation of the overall efficiency rate associated with multiple BMPs:

- Equation 1a: Non-overlapping BMPs[53]

  $E_{1+2} = E_1 + 0.89E_2(1 - E_1)$

  Where,

  E_{1+2} = Combined Efficiency of BMPs #1 and #2
  E_1 = Efficiency rate of BMP #1 (the more efficient of the two BMPs)
  E_2 = Efficiency rate of BMP #2

- Equation 1b: Overlapping BMPs[54]

  $E_{1+2} = E_1 + 0.8E_2(1 - E_1)$

  Where,

  E_{1+2} = Combined efficiency of BMPs #1 and #2
  E_1 = Efficiency rate of BMP #1 (the more efficient of the two BMPs)
  E_2 = Efficiency E_{1+2} rate of BMP #2

The effectiveness of additional BMPs can be calculated using the same equation structure. For example, if a third BMP is added, the results from Equations 1a or 1b would be used as follows:

Equation 2a or 2b:

$E_{1+2+3} = E_{1+2} + (\text{discount})E_3(1 - E_1)$

Where,

E_{1+2+3} = Combined Efficiency of BMPs #1, #2 and #3
E_{1+2} = answer from equation 1a or 1b
Discount = either 0.11 or 0.2, depends whether E_3 is overlapping or not
E_3 = Efficiency rate of BMP #3

[53] Non-overlapping BMPs are pairs of BMPs that are function in discrete physical locations, and/or employ different mechanisms to reduce soil erosion, such as irrigation upgrades (on-field, decreases disruptive force of water application) and filter strips (edge-of-field, creates physical barrier for moving water and sediment).

[54] Physically overlapping BMP pairs are those that include any combination of the following: cover crop, strip or no-till, sprinkler upgrade, microirrigation upgrade, surge irrigation, or straw in furrows.

Appendix C. BMP Quality Standards

BMP Quality Standards are based on NRCS Practice Codes and work completed by Dr. Carter (2002) in support of the 2010 Water Quality Trading Framework.

In July 2015, The Freshwater Trust completed a review and recommendation of BMPs and their associated efficiency rates appropriate for trading. Based on lessons learned through the Joint Regional Recommendations process, these quality standards should be updated, approved by DEQ, and added to this appendix C.